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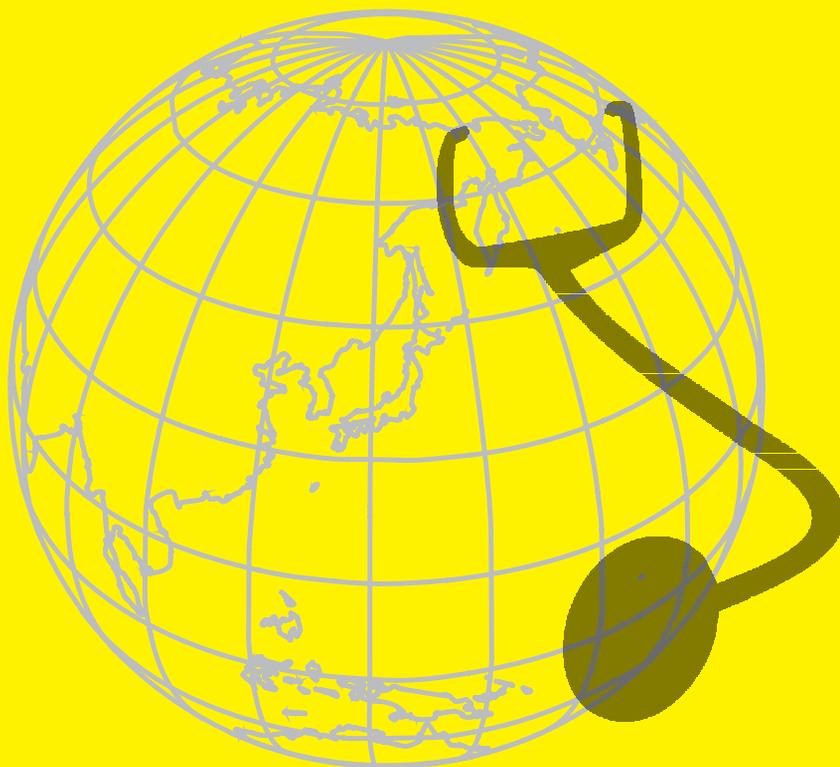
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A Study on Factors Associated With the Deterioration of Respiratory Function Among Male Textile Workers in Uttar Pradesh

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ABSTRACT

Background: The textile and clothing sector in India is changing as a result of developing technology and economic conditions, with businesses restructuring, modernizing, and adapting to technological change. Reduction of respiratory function among Textile workers in the textile industry has been observed since the 1970s. A contaminant of raw cotton fiber and cotton dust, has been proposed as a affecting agent that may deteriorate the respiratory function. Present study aimed to find the factors associated with the deterioration of respiratory function among male Textile workers.

Methods: The sample consisted of 253 men above the age of 20 years who had worked for at least 3 months in a textile factory and 245 male Non Textile workers of same area were studied. All the respondents were interviewed by a pretested questionnaire to gather information regarding the chest symptoms, certain personal characteristics and occupational history. Statistical analyses like Chi-square and odds ratio was done to determine the significant difference between male Textile Workers and male Non Textile Workers.

Results: Univariate analysis of the factors for symptomatic byssinosis showed that dusty worksites, heavy smoking and duration of service years were significant. Logistic regression analysis showed that working in the scouring (odds ratio 11.6), spinning (odds ratio 4.68) and weaving sections (odds ratio 2.8), heavy smoking (odds ratio 11.9) and more than 10 years of service (odds ratio 2.3) were independent significant risk factors.

Conclusion: Efforts to reduce dust levels in the working environment and to discourage smoking among textile workers need to be strengthened to minimize the risk of developing byssinosis.

Keywords: Occupational Health, Respiratory Functions, Textiles Workers, Working Environment

INTRODUCTION

Occupational diseases reflect health hazards brought on by exposure within the work environment. Due to lack of education, unaware of hazards of their occupations, general backwardness in the sanitation, poor nutrition and climatic proneness of this geographic region to epidemics aggravate their health hazards from work environment (Wang et.al, 2003).

In 1956, an epidemiological study in the cotton industry in the UK documented the occurrence of respiratory problems like byssinosis (Schilling, 1956) Worldwide, India is the second largest producer of textile goods, which account for 20% of the national industrial output. Twenty million workers are employed in 1175 cotton mills across the country,

representing a major occupational group (Datt and Sundaram, 1998). Exposure to cotton dust has long been associated with adverse respiratory effects and diminished lung function, which is most evident as byssinosis, a chest tightness experienced by workers on the first day back after a weekend or vacation break (Schilling, 1956, Roach and Schilling, 1960; Berry et.al, 1973). Most studies indicate that adverse respiratory effects are more closely associated with cotton fiber dust. (Castellan et.al,1987; Castellan et.al, 1987 and Kennedy et.al, 1987).

Respiratory problems have been reported from most countries with a textile industry. Its prevalence varied from 2% in the USA in the late 1970s, 4 to 63% in England in the late 1950s (Schilling, 1962). While the prevalence is decreasing in developed countries,

it continues to be high in developing countries. In Turkey it was 14.2% in the past decade. (Altin et.al, 2002).

There are few studies on Respiratory problems among cotton textile workers in India (Murlidhar et.al, 1995; Mathur et.al, 1993; Barjatiya et.al,1990 and Jaiswal, 2004). Murlidhar et. al, examined 273 cotton textile workers in Mumbai and found that 54 of 179 workers (30%) in dusty sections and 16 of 94 workers (17%) in non-dusty sections had respiratory problems. They also developed a questionnaire for the assessment of respiratory problems (Murlidhar et.al, 1995). In Uttar Pradesh the textile industry is more than a century old but no study has assessed the magnitude of or the risk factors for respiratory problems. Present paper carried out a case-control study to find out the risk factors associated with the occurrence of respiratory problems.

SUBJECTS AND METHODS

Present paper included all men, 20-49 years of age who had been working in the factory for at least more than 3 months. The details of the sample studied are shown in Table1. The analysis was done for 253 subjects-60 from the spinning section, 35 from the Scouring section 69 from the weaving section and 89 from the non-dusty sections. Present paper detected 95 cases of respiratory problems, of which 32 had associated chest pain with cough. For the risk factor analysis, 67 cases with only symptomatic respiratory problems were included. To choose controls a population of workers not working in Textile Industry was selected (n = 245). The Workers and controls (Non-workers) were matched for age, sex and socio economic status. Textile Workers and controls were divided into three age groups, mainly 20-29 years, 30-39 years and 40-49 years. Subjects were chosen by pupusive stratified sampling technique.

Table 1. Distribution of study sample

Total workers in the factory	1650
Excluded	685: Female Workers in the factory, those <20 years of age and with a duration of exposure <3 months.
Remaining workers,	965
26% of this sample were taken	253
Distribution of this sample in different sections of the factory	Spinning 60, Scouring 35, Weaving 69, Non-dusty 89.
Respiratory Problems	99
No Respiratory Problems	154
Excluded because of chronic bronchitis	22
Control population	245
Mean age of TW males	31.98
Mean age of NTW males	32.48

All the sampled individuals were interviewed with the help of an interview schedule prepared by adopting the standard Questionnaire (Florey and Leeder, 1982) and the Byssinosis Questionnaire used by Murlidhar et. al, (1995). Before the interview, an informed consent was obtained from each worker by explaining the nature of the study and the confidentiality of the information required.

Information was collected on age, smoking behaviour, occupation, overcrowding and fuel used for cooking at home. Weight and Height was accurately recorded, using standard techniques (Weiner and Lourie, 1981). For the type of fuel used, the predominant fuel used over the past year was considered. Those smoking >10 cigarettes or bidis per day for the last 20 years or more were considered heavy smokers (smoking index of 20 pack-years). Overcrowding was classified according to the number of persons per room. Pulmonary function tests done for all the subjects included forced vital capacity (FVC), forced expiratory volume in the first second (FEV1.0) and FEV1.0/FVC. Three readings were taken after explaining and demonstrating the test procedure. The best of three readings was considered for analysis. The predicted value of FEV1.0 for the concerned population was calculated and 80% of the predicted value determined.

Statistical analysis

The data were analysed by SPSS (Statistical Package for Social Sciences) version 13.0. Chi-square and odds ratios (ORs) with 95% confidence intervals (CI) were calculated for univariate analysis. Subsequently, the significant factors on univariate analysis were entered into a logistic regression model and the adjusted ORs with 95% CI obtained. Independent sample t-test was used for the analysis of pulmonary function tests.

RESULTS

The study population consisted of 99 cases and 245 controls. The socioeconomic status of all the workers was similar. Univariate analysis of the risk factors for respiratory problems showed that dusty worksites such as the spinning, scouring and weaving sections, heavy smoking and duration of service >10 years (Table 2) were significant. Body mass index (BMI), fuels used for cooking and overcrowding were not found to be statistically significant.

A logistic regression analysis (backward step-wise) showed that dusty worksites such as the spinning, carding and weaving sections, heavy smoking and duration of service >10 years were independent significant risk factors. Workers in the scouring sections had 11.6 times (95% CI: 1.9, 19.6), spinning sections

Table 2. Univariate analysis of risk factors for respiratory problems.

Factors Work site	Textile Wokers (%) (n=253) (n=99)	Respiratory Problems (%) (n=245)	Controls (%)	Chi-square (95% CI)	Odds ratio
Dusty section	65.2	78.5	88.7	6.5*	3.7 (1.3, 10.9)
Non-dusty section	34.8	21.5	11.3		1
Sections					
Scouring	22.5	24.5	11.0	11.0*	11.6 (1.9, 19.6)
Spinning	14.2	12.8	12.7	4.68 (1.9, 21.3)	
Weaving	25.7	54.7	63.0	5.0*	2.8 (1.1, 9.7)
Non-dusty	37.6	7.0	13.3	1	
Smoking					
Heavy smokers	74.6	68.6	44.4	11.5*	11.9 (1.7, 19.5)
Others	22.6	31.4	55.6	1	
Duration of service					
>10 years	65.0	72.0	36.2	5.3*	2.3 (1.08, 5.8)
<10 years	35.0	28.0	63.8	1	
Body mass index					
>25	17.5	19.0	5.8	1.6	1.3 (0.7, 3.2)
<25	82.5	91.0	94.2	1	
Fuel used for cooking					
Wood and kerosene	49.8	66.0	53.9	1.7	0.5 (0.5, 2.8)
Gas	50.2	44.0	46.1	1	
Overcrowding					
Present	73.8	60.7	65.1	0.6	0.9 (0.5, 2.3)
Absent	26.2	39.3	34.9	1	

*p<0.05

had 4.68 times (95% CI: 1.9, 19.6) and those in the weaving section had 2.8 times (95% CI: 1.1, 3.6) higher risk of developing respiratory problems compared with those working in the non-dusty sections. Workers with a smoking index of >20 pack-years (heavy smokers) had a 11.9 times (95% CI: 1.7, 19.5) higher risk for respiratory problems. Also, workers with a duration of service >10 years had a 3-fold (95% CI: 1.1, 5.6) higher risk compared with those with <10 years of service. Analysis of pulmonary function tests showed that there was a marginal but statistically insignificant difference in all the para-meters between the cases and controls (Table 3).

Table 3. Analysis of Pulmonary function test

Test	Mean	p value*
Forced vital capacity (FVC) (lit.)		
Cases	2.31	1.8*
Controls	3.61	
Forced expiratory volume in one second (FEV 1.0) (lit.)		
Cases	2.32	1.7*
Controls	2.67	
FEV 1.0/FVC (%)		
Cases	87.5	0.8
Controls	82.4	

* Independent sample t-test p<0.05 considered significant

DISCUSSION

The textiles sector contains many hazards and risks to workers, ranging from exposure to noise and dangerous substances, to manual handling and working with dangerous machinery. Each processing stage - from the production of materials to the manufacturing, finishing, colouring and packaging - poses risks for workers, and some of these are particularly dangerous for women's health.

This short document cannot cover all the hazards and risks in all the parts of the textiles sector, but highlights some of the key issues, particularly to women workers, and how worker safety and health can be managed. Though cotton dust has been established as the causative agent for respiratory problems, it is important to determine the other risk factors associated with the occurrence of the disease so as to implement comprehensive preventive measures.

Present paper used the WHO definition of respiratory problems and excluded all those who had chronic bronchitis. Kamath et. al, have reported that chronic bronchitis is a separate entity among cotton textile mill workers (Kamath et.al,1981). Gupta (1969) in a review of respiratory problems found that many studies did not exclude patients with chronic bronchitis and this might affect the results.

In the past decade, studies from Turkey and China have shown that dust levels above the recommended values are associated with a high prevalence of respiratory problems (Altin et.al, 2002 and Christiani et.al, 2001). The risk factors identified in our study such as working in the scouring, spinning and weaving sections, long exposure and heavy smoking have been reported by others as well. A study from France showed an OR of 7.3 for an exposure of 20 years compared to an OR of 2.8 for an exposure of 10 years in our study. Similarly, they had an OR of 3.7 for the dustiest sections compared with 11.0, 4.7 and 2.1 found in our study for the scouring, spinning and weaving sections, respectively. The French study did not find any association with smoking though our study did (Massin et.al, 1991). A study from Lancashire, UK reported that the prevalence of respiratory problems like byssinotic symptoms was significantly related to years worked in the cotton industry, exposure to dust, quality of cotton used, work area, ethnic origin and smoking habits (Cinkotai et.al, 1988). However, another study from Lancashire showed that byssinosis was rare among workers engaged in cotton weaving (Raza et.al, 1999). In a study from Kanpur, only dustiness and length of exposure were important contributory factors to the occurrence of respiratory problems. The risk of respiratory problems among workers in the card room, blow room and waste plant sections and those who had an exposure of >5 years was nearly 3 times higher compared to workers in other sections of the mill and or those with <5 years of exposure (Mathur et.al, 1993). Besides the above-mentioned studies, there are also descriptive and comparative studies, in which some attempt has been made to identify the risk factors. In a study from Kishangarh, India it was reported that a majority of workers had developed the disease after 16 years of exposure, unlike in our study where the risk was high among those with 10 years of exposure. The disease was more common among smokers and severe among those who were consuming 15 pack-years of cigarette/bidis, (Barjatiya, 1990) comparable with our results.

This variation of results may be due to varying definitions of the disease. In another study from Mumbai, it is reported that the incidence of byssinosis was 30% among workers in dusty departments such as spinning, winding and weaving, compared with 17% in those working in the less dusty sections. Similarly, our observation of exposure of 10 years (OR = 2.8) as a risk factor is comparable with the finding of the Mumbai study in which 45% of the workers who had > 20 years of service had respiratory problems compared with 24% among those who had < 10 years of service (Murlidhar et.al, 1995).

Pulmonary functions showed a decline in the workers having respiratory problems, but it was not statistically significant. Other studies have reported either an insignificant decline in pulmonary functions or a decline independent of the symptoms of respiratory problems. A study from California analysed the acute effect of cotton gin environment on lung functions and found no correlation between the symptoms of respiratory problems and objective decrease in FEV_{1.0} (Larson et.al, 1981). The same researchers conducted a prospective, longitudinal study over a period of 4 years and reported an insignificant decline of FEV_{1.0}, FEV_{1.0} /FVC and FEF (forced expiratory flow) 25%-75%. They failed to find any detrimental effect of the cotton gin environment on the rate of decline and reported the decline to be independent of the symptoms of respiratory problems (Larson and Barman, 1989). In a study from France, only peak expiratory flow was taken into consideration and the absence of a constant link between Monday tightness and drop of peak expiratory flow was reported (Massin et.al, 1991). In textile industries in north Portugal, workers exposed to cotton fibres in spinning areas had the highest prevalence of symptoms and reduction of the FEV_{1.0}. There were no cases of respiratory problems among workers in the weaving areas. Smoking habits were related to a reduction in FEV_{1.0} and severity of respiratory illness but not to the presence of byssinosis (Da Costa et.al, 1998). A 15-year longitudinal study from Shanghai, China reported that cotton workers had small, but significantly greater, adjusted annual declines in FEV_{1.0} and FVC than did silk workers. Years worked in cotton mills, high level of exposure to endotoxins, and across-shift drops in FEV_{1.0} were found to be significant determinants of a longitudinal change in FEV_{1.0}, after controlling for appropriate confounders. Moreover, there were statistically significant associations between excessive decrease in FEV_{1.0} and respiratory problems, chest tightness at work and chronic bronchitis in cotton workers. It appears that longitudinal studies of 10-15 years' duration may be required to study the effect of respiratory problems on lung functions (Christiani et.al, 2001). The results of our study confirm the findings of some previous studies. There is a need for textile mills to reduce the dust levels in the scouring, spinning and weaving sections. Workers should be encouraged to use protective measures such as face-masks. Since heavy smoking is a risk factor for respiratory problems, measures should be taken to reduce smoking among textile workers. Rotating workers from dusty to non-dusty sections on a regular basis might reduce the length of exposure to higher dust levels, thereby reducing the risk.

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Intraneural Cyst of Common Peroneal Nerve - A Case Report

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ABSTRACT

Intraneural cyst of common peroneal nerve is a rare case of foot drop. A patient presented with swelling on the lateral aspect over the head of fibula and foot drop. The patient had difficulty in walking. Case was investigated. Radiographs revealed no abnormality but MRI was diagnostic. Surgery was done with excision of the cyst and marsupialization of common peroneal nerve. The patient was then followed-up with improvement in dorsiflexion of foot and improved walking over subsequent follow-ups.

Keywords: *Intraneural, swelling, dorsiflexion.*

INTRODUCTION

Acute injury to the peroneal nerve is a frequent occurrence due to trauma, surgery or postural entrapment of the nerve at the fibular head. Non-traumatic causes are rare and commonly involve tumors, intraneural ganglia, hematoma or cysts^{2,3}.

The peroneal nerve branches from the sciatic nerve at the popliteal groove, passes over the lateral head of gastrocnemius muscle lateral to the groove; having a very superficial route in the 4 cm long area below the knee and around the fibular head and neck, the nerve is only protected by the skin and superficial fascia. It passes through a fascial fibrous arch surrounded by the long peroneal muscle and the intermuscular septum. In the peroneal nerve mononeuropathy frequently encountered in the lower extremity, the nerve is injured commonly in this 4 cm long area where it shows a superficial location or is entrapped when the fibrous arch is thickened, narrowing the tunnel the nerve passes through^{1,3,5}.

CASE REPORT

A sixteen-year old adolescent male presented with foot drop and a small swelling over the head of the fibula on the right side for the past three months. There was no history of trauma, surgery or abnormal posture.

About three months back the patient noticed a small swelling on the lateral aspect over the head of fibula. The swelling increased slowly for the first two months and had remained static for the past one month. Initially he complained of pain in the leg as well as tingling sensation. He had some difficulty in walking and clumsiness of foot which progressed to foot drop.

On examination, the patient had a high-stepping gait. There was atrophy of the leg muscles as well as foot. The patient was unable to dorsiflexion the foot (Fig-1). On neurological examination, there was decreased sensation over the leg and dorsum of foot in the distribution of common peroneal nerve.

There was a small swelling about the size of a coin over the head of fibula on right side (Fig-2). The swelling was non-tender but tapping over the swelling revealed a tingling sensation in the leg. The consistency was soft and margins were well defined.

The case was investigated. The x-ray of the leg and foot revealed no abnormality. Fine needle aspiration

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cytology of the swelling revealed some cystic material. But the diagnosis was confirmed on MRI which revealed an intraneural cyst of common peroneal nerve as the cause of foot drop (Fig-3). Surgery was carried out with excision of cyst and marsupialization of common peroneal nerve. Patient was followed-up at monthly intervals. In the first few follow-ups, there was slight dorsiflexion of the toes and in the subsequent follow-up there was increased dorsiflexion of foot. Patient now can dorsiflex the foot against gravity and is still under regular follow-up [Fig-4]



Fig. 1. Photograph of patient showing foot drop

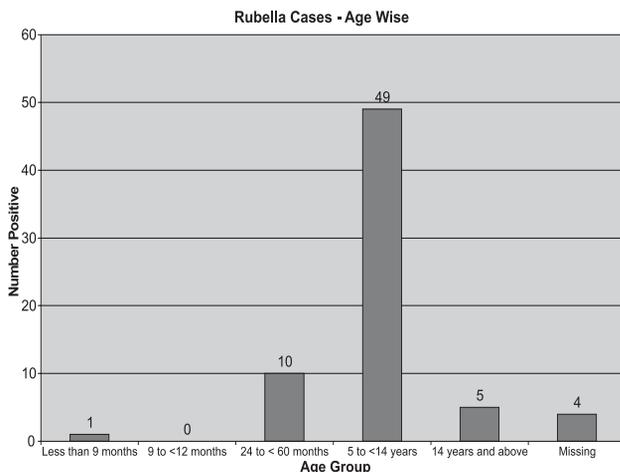


Fig. 2. Swelling over head of fibula

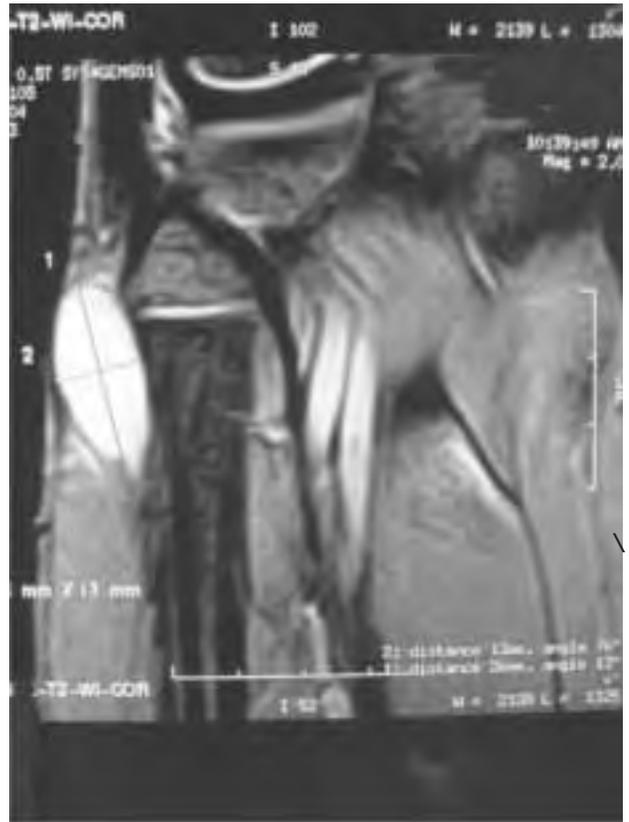


Fig. 3. MRI showing intraneural cyst of peroneal nerve



Fig. 4. Follow up showing partial recovery of dorsiflexion

DISCUSSION

Intraneural cysts are rare and benign nerve tumors. There are commonly reported in the legs mostly affecting the common peroneal nerve at the neck of fibula. Lesions may occur in motor or sensory nerves but mostly in mixed nerves. Although they usually affect the ulnar nerve at the elbow, cysts have also been reported at the following sites: (i) the posterior interosseus nerve at the level of brachioradialis; (ii) the median nerve at the level of pronator teres and in the carpal tunnel; (iii) the ulnar nerve in Guyon's canal and at the level of the deep palmar aponeurosis; (iv) the digital nerves and their dorsal branch^{4,6,7}.

Intraneural cysts often affect middle-aged men and usually present with pain or the symptoms of nerve compression. The appearance of clinical signs after exertion is characteristic. A history of acute minor trauma is often noted. The pain may be due to intracystic bleeding. Soon after neurological deficit appears in the corresponding nerve territory and the pain settles briefly. The time between the onset of symptoms and diagnosis varies from 1-2 months to 2 years^{1,8,9}.

Pain is usually intermittent and a positive Tinel's sign is uncommon. A swelling or nodule on the course of the nerve may be found. A motor deficit is usually present with sensory change in 50%. Plain radiographs are usually normal. Although ultrasound can identify the location and nature of the cyst, MRI is diagnostic. It can also assess the state of the nerve. MRI allows differentiation between an adjacent articular synovial cyst and a cystic schwannoma⁶.

Treatment is always surgical. Nerve resection and grafting must not be performed even if the lesions appear to be extensive. It is essential to maintain nerve continuity, first by incision and drainage of the contents of the cyst after epineurotomy, then by division of the neighbouring fibro muscular arch. An exoneurolysis is also performed. Complete resection of the cyst is dangerous if not impossible. There is no plane of dissection between the tumor and the adjacent fascias. The contents of the cyst are similar to those of synovial cyst. The intracystic liquid is a cellular mucopolysaccharide². The cystic wall has a fibro lamellar pattern and contains some inflammatory cells.

For long-standing tumors, the mean time to neurological recovery which occurs in most cases is ten months. Pain disappears rapidly after decompression and recovery occurs within a few

months. Recurrences are rare. Long-term follow-up should include clinical examination and MRI, if necessary.

The pathogenesis remains controversial. The tumor is generally caused by mucoid degeneration of fibrous tissues or metaplasia of neural connective tissue after repeated micro trauma of the nerve within a confined space. Some have proposed that intraneural cysts originate in embryonic, ectopic, synovial fluid and that the cystic masses develop secondarily.

The intraneural cyst of common peroneal nerve is rare and benign tumor which remains an enigma. Successful surgical treatment depends upon early diagnosis before nerve damage has occurred^{5,9}. Our principal concern is the risk of recurrences, a worry which warrants long-term review.

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Tele-Health Medical Diagnostics System with Integrated Electronic Health Records

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ABSTRACT

Providing affordable and quality Education and Healthcare are the current challenges in the developing and densely populated countries, such as India and China. The Healthcare Delivery Systems are overloaded because of the inefficient expensive systems, processes and resources. Use of Information Technology in Healthcare, especially a Tele-health medical diagnostics system, can potentially improve healthcare. The system developed offers medical diagnosis, ongoing patient care and has an ability to monitor patients remotely. This system unifies diagnostic hardware like Microscope and Vital Signs Monitor with the diagnostic software. The software consists of modules for Electronic Health Record and Disease Identification. The software has the ability to automatically identify the vital parameters and transmit the parameters to the remote doctor through broadband or wireless connectivity. The system offers simplicity and cost efficiency making it an ideal solution for use in rural areas. Currently the system is being used at few locations in India on a pilot basis and the results are very encouraging.

INTRODUCTION

The healthcare industry in India which comprises hospital and allied sectors is projected to grow 23 per cent per annum to touch US\$ 77 billion by 2012 from the current estimated size of US\$ 35 billion (₹1610 Billion) in 2009. The central and state governments are responsible for the provision of primary healthcare in the country. A spending of 1% of the GDP (effectively about Rs. 1050 per capita) on public health is not only dismally low but most of the expenditure is on staff salaries leaving little for facilities, drugs and other consumables. This is very low compared to countries like US - 16%, UK - 7.8%, Germany - 10.8%, France - 10.4% and Japan - 8%¹. Though there is a large network of public primary care facilities in India for the healthcare delivery with numerous secondary and tertiary care facilities, the effectiveness of healthcare delivery is questionable in the public primary care facilities. Building better forward and backward linkages through a superior referral system would cause the secondary and tertiary care facilities to be more manageable and prevent them from being overburdened. Healthcare is also people / professional driven and depends on the competencies of the professional staff rather than the physical infrastructure. But this does not undermine the importance of physical infrastructure needed at many of the care centers.

In a large, overpopulated country like India with its complex social structure and economic extremes, the effect on health system is multifold². Government supported healthcare delivery follows a three tier system and is the primary responsibility of each state. Majority of the hospitals in the country are rooted in manual processes, which are unable to cope with the volume of data generated³. According to WHO, technologies form the backbone of the services to prevent, diagnose and treat illness and disease⁴. Rural India consists of approximately 638,000 villages inhabited by more than 740 million individuals. A network of government-owned and operated sub-centers, primary health centers (PHCs) and community health centers (CHCs) is designed to deliver primary health care to rural folks. Sub-centre is the first contact point between the community and the primary health care system. Current norms require one sub-centre per 5,000 persons, one PHC per 30,000 people and one CHC per 120,000 people in the plains. Smaller populations qualify for each of these centers in the tribal and hilly areas. Each PHC serves as a referral unit to six sub-centers and each CHC to four PHCs. A PHC has four to six beds and performs curative, preventive and family welfare services. PHCs in India service more than 30,000 people each without a telephone connection and state quota of medicines of less than US\$ 0.10 a year per person in their jurisdiction area⁵.

This extremely poor infrastructure in terms of communication, patient care and human resources is a serious bottleneck to attempts at reforms since people are working everyday with little incentives, time or resources to try and embrace new technologies and new approaches to healthcare⁵. In addition, the inefficient use of resources adds to the problems in India's healthcare delivery mechanism⁶. Unequal distribution of resources is a reflection of this inequality and adversely affects the health of under-privileged population. The under-privileged are unable to access the healthcare due to geographical, social, economic or gender related distances². Reliable information and effective communication are crucial elements in public health practices. The use of appropriate technologies can increase the quality and the reach of both information and communication⁷. An implementation of the system demonstrated that electronic summary utilization data could provide daily information that would support the improvement of health care outcomes and efficiency⁸. It was also shown in this study that this approach could be implemented in a simple, direct manner with minimal expenses. The benchmark suggests that well functioning health centers can take care of the vast majority of patients' problems⁹.

After decades of traversing a snail-like adoption curve, computerization is on the verge of altering medical practice fundamentally, partly because of the quality revolution. The labor costs of retrieving and reviewing medical records to gather the required quality data and the ineffectiveness of non-systems-based solutions for improving performance are driving institutions to recognize the need to track clinical processes and outcomes and to prompt clinicians via computerized systems¹⁰. A further study determined that there is a need to create viable IT-based services, among others, with regard to micro-enterprises in rural areas¹¹. Barriers to implementation of IT in Healthcare Delivery can be classified as situational barriers (including time and financial concerns), cognitive and/or physical barriers (including users' physical disabilities and insufficient computer skills), liability barriers (including confidentiality concerns), and knowledge and attitudinal barriers¹².

Healthcare Information and Management Systems Society (HIMSS) under the aegis of its Global Enterprise Task force headed by Dr. Steve Arnold was asked to investigate efforts to implement the EHR in a host of countries around the world¹³. The countries covered by this study were Netherlands, Greece, England, Wales, Denmark, Norway, India, New Zealand, Malaysia, Hong Kong, Singapore, Israel, Canada and USA. According to this study local and nationwide efforts to realize EHR systems were

intermittently reported. In India, the IT adoption in Healthcare is estimated to be only five percent¹³. To gain insight into the functioning of the healthcare centers with respect to use of information technology and their effectiveness in healthcare delivery, a survey was done. This survey was undertaken in Gadag and Bagalkot districts to assess the ground realities in healthcare centers by evaluating various parameters that would influence the quality of healthcare delivery.

MATERIAL AND METHODS

The details of the district healthcare facilities - the District Hospitals (DH), Taluk Hospitals (TH), Community Healthcare Centers (CHC), Primary Healthcare Centers (PHC), Primary Healthcare Units and National Leprosy Control Center (NLCC) - were obtained from the District Health Department. Out of the total 107 facilities, 83 facilities participated in the assessment that accounts to 77.6 % of assessment coverage.

A questionnaire consisting of a set of 86 questions related to patient load, medical record formats, hospital infrastructure and staffing information was used for this assessment. Responses to the questionnaire were tabulated. The responses were used to depict the results and draw inferences.

RESULTS OF THE SURVEY

On an average 70 patients per day use the healthcare centers. The variance in this number is significant with some interior HCs having less than 10 patients per day visiting them and more than 100 patients per day visiting the THs. The average Inpatient to Outpatient ratio is 1:10, with the average duration of stay of inpatients being 2-3 days. The hospitals surveyed had an average of 10 beds for inpatients in the hospital. Each HC, on an average has two full-time doctors and between 11-20 additional employees. The average age range of full time doctors working in these HC is 30-35 years. HCs reportedly have an average of 15 paramedical staff. Quality of healthcare depends on the efficiency of the doctors as they have to attend to at least 35 patients on an average daily. Use of health information technologies has the potential to improve.

Patient Records

All the HCs surveyed used paper to maintain patient medical records and spent a lot of efforts (time/money) on maintenance.

Quality of Care

As many as 49 out of 83 HCs responded that they fell far behind on the use of proper technology in treating patients. They also felt that they could have

treated patients better if they had access to quicker and more accurate information.

Patient Referrals

Each HC refers 5 to 10 patients to other HCs every month. Patients are referred from one HC to another predominantly (77%) by using paper documents and the rest are referred over telephone. In the case of referral based on paper documents, the quality of information flow depended on the past history of the patient and the respondents further conveyed that an accurate record of patient history was not available in most of the cases. In the case of telephone referral, the quality of referral is based on the doctor's knowledge about patient medical history and also depends on the extent of time spent on phone to provide the history. As doctors keep treating on an average of 70 patients per day, it will be difficult to convey accurate diagnostic information during the referral. In both cases, the quality of referral suffers leading to repetition of the same treatment or ineffective treatment at the secondary Healthcare center. This reduces the quality of Healthcare and increases the cost of treatment.

Improvement of Operating Efficiency

Of the total 83 respondents, 69 respondents (83%) felt that implementing an IT Solution would improve Patient Care and Administration. While most respondents agreed that an IT solution promises more results than it can deliver, on an interesting note, most respondents also thought that implementation of an IT solution would affect all stakeholders within the HC.

TELE-HEALTH MEDICAL DIAGNOSTICS SYSTEM

From the literature survey, it is evident that there is very less work done to increase the effectiveness of the Healthcare Delivery System in Rural India. There is a need for systematic evaluation of the requirements and conditions of Rural India for better and affordable Healthcare. The use of Information Technology in this area will help.

The system developed is a tele-health medical diagnostic system which will be useful in mitigating the current issues and challenges. The solution comprising of both hardware and software addresses the pressing needs of today like introducing Electronic Health Records and helping control Disease Outbreak. The system enables multi-point, multi-referral consultation and one to one consultation between patient and doctor as well as doctor and doctor.

Hardware

The hardware is packaged into a "box" powered by an Intel Processor and Solar Panel / UPS as shown in Fig.1

Details of Hardware

- Intel Embedded Processor (Dual Core)
- Keyboard / Mouse / Web-Cam
- Vital Signs Monitor
- Wireless Connectivity
- Microscope with Camera
- Powered by Solar Panel/UPS



Software

The Software has the following modules:

Medical Diagnostics Kit

This is a software with necessary interfaces and algorithms to diagnose disease conditions. Capturing the patient symptoms, providing differential diagnosis, measurement of vital signs and analyzing patient samples for various diseases are the key functions of this software.

- The patient is registered during the first visit and the symptoms are recorded.
- **Integrated Vital Signs Monitor:** A single point capturing of vital signs of a patient like body temperature, non-invasive blood pressure (NIBP), pulse rate, SPO2, electro cardiogram (ECG) and heart rate. These vital signs are captured and automatically uploaded to the patient electronic health record.
 - ♦ The ECG can be viewed as a 3/5 - channel waveform with 13 arrhythmia classification. The software will be able to calculate Heart Rate, identify and judge lead off and detect ST segment. The depressed or elevated ST segment helps in the diagnosis of ventricular ischemia or hypoxia.
 - ♦ Non-Invasive Blood Pressure (NIBP) can be measured in different modes from Neonatal to Adult mode. Manual, Automatic, Continuous measurement modes can also be used.

Calibration and Leakage air checking can be performed.

- ♦ The pulse oximeter (SPO2) provides the non-invasive measurement of arterial blood oxygen saturation and pulse rate. Measurement modes can be set from neonatal to adult. It is a single channel plethysmogram.
- ♦ Respiration rate is calculated with one channel respiration waveform and provides apnea alarm.
- ♦ Temperature data can be obtained from two channels.
- **Integrated Disease Identification using Image Processing & analyzing algorithms:** This module provides a cost effective means to diagnose disease through automated blood test procedures. Absence of a disease / health condition is indicated clearly by using the blood / sputum smear. Possible presence of an indication of a disease / health condition is flagged by the system for further analysis. Tele-Health Kiosk software is capable of supporting tele-pathology through.
 - ♦ Dynamic Imaging – enables a doctor to view the real time pathological images. A technician places the prepared smear slide under a microscope integrated with a digital camera. Doctor from a remote place can send a request to view the slide / smear to a technician. On technician accepting the request, doctor will be able to view the slide / smear in real-time & will be able to make annotations of the image.
 - ♦ Static Imaging – Allows a technician to upload the stored pathological images into the patient EHRs. Doctor will be able to view these stored images at a time convenient.

The software modules help the doctor / technician to measure DBC (Differential Blood Count), detect malarial parasites and recognize tuberculosis bacilli automatically.

- ♦ CytoSight: A digital microscopy product that can analyze blood smear slides to get differential blood count (DBC) using image processing.
- ♦ Malaria Detect: Analyses blood samples to detect RBCs affected with malaria parasites.
- ♦ Tuberculosis Detect: Analyses the sputum samples to detect tubercle bacilli (*Mycobacterium tuberculosis*).
- ♦ Tomo Sight: This allows a technician to upload the radiology images from different modalities viz X-Ray, CT-Scan & MRI that will be transmitted to a remote doctor for consultation. Advanced image compression makes the image transfer with a low internet bandwidth possible.

Integrated Electronic Health Records (EHR)

EHR is an integral part of Tele-Health Kiosk software. Every activity that is carried out by a

technician or a doctor in relation to a patient is recorded in digital format. The key features of EHR software:

- ♦ Patient Registration with patient unique ID.
- ♦ Creation of multiple visits against a patient unique ID to maintain the patient history.
- ♦ Recording the patient illness details and treatment given for future use
 - ✓ Captures the symptoms & complaints of visit
 - ✓ Maintains the history of patient images (Viz., Wounded body part, Broken leg)
 - ✓ Maintains the history of Pathology images with the annotations
 - ✓ Maintains the history of Radiology images with the annotations
 - ✓ Captures prescriptions by a doctor.
- ♦ The captured information is available to view during the patient's subsequent visits that aid a doctor in decision making & thus providing quality care.
- ♦ Transfer patient data between PHC, CHC and District Hospitals (during patient referral)
- ♦ Patient referral for higher medical care is enabled electronically thus improving the quality of referrals.

Telemedicine

Network Software to connect various nodes for exchange of visual image, audio and data between the PHCs and District / City Hospital.

The above solutions transform the PHC into a center providing powerful healing to rural patients. It can treat those in need, save their data, share their data for expert consultation, save a lot of time in administering care and also network between all the healthcare centers. Tele-Health Kiosk can enable treatment to a patient by helping a trained non doctor at PHC collect patient information and make information available to doctor at remote location to provide treatment or advise. This can be enabled on an online or offline mode.

CONCLUSION

By implementing such a system healthcare awareness of patient increases and demographic information will be available for planning better healthcare delivery. The system with online information removes the need for patient mobility and provides flexibility to doctor by enabling a doctor to attend to patients at his / her convenient time. By deploying such Tele-Health Kiosks in different healthcare centers in rural India and interconnecting them, efficiency of Healthcare Delivery can be increased thereby reducing cost of healthcare. Currently the Tele-Health Kiosk is operational in few

healthcare centers in Karnataka. The initial response from rural patients and doctors is encouraging.

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Evaluation of Vaginal versus Abdominal Hysterectomy for Non Prolapsed Uterus with Benign Gynecological Disease

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ABSTRACT

Introduction: Vaginal hysterectomy is most common gynecological operation. It has many advantages, like low morbidity rate and early discharge from hospital, over abdominal hysterectomy when performed for benign gynecological conditions.

Objective: To report experience with vaginal hysterectomy performed for benign gynecological conditions.

Methods: 122 hysterectomies were performed in 3 years, from Jan 2009-Dec 2011; One hundred twelve women had vaginal hysterectomy for the uterus having size less than 14 weeks. Demographic and other useful scientific data were noted and analyzed to come to the conclusion that vaginal hysterectomy is safer operation than abdominal hysterectomy even for non prolapsed uterus.

Result: Almost 83.92 % cases had no complication and there were no life threatening complications. However 02 (1.78%) cases needed conversion to abdominal route without any serious morbidity.

Conclusion: Vaginal hysterectomy is simpler, feasible and uneventful treatment modality for gynecological indications other than utero-vaginal prolapse.

Keywords: : Vaginal hysterectomy, None prolapsed uterus, Morcellation

INTRODUCTION

Hysterectomy is one of the most common surgical procedure performed in gynecology by abdominal or vaginal route. It is well known that vaginal Hysterectomy carries the least morbidity & mortality having many advantages over abdominal hysterectomy in terms of low morbidity, early recovery, low complication rate, early resumption of work and low cost. Besides these facts there is no visible scar on Abdomioperineal region. Vaginal Hysterectomy in large size uterus could be performed easily by bisection, myomectomy and/or debulking.

The aim of the present study was to report our experiences in performing Non descent vaginal hysterectomy (NDVH) for benign gynecological conditions by different surgical techniques that

makes vaginal hysterectomy simpler, feasible and uneventful.

MATERIALS AND METHODS:

This prospective study was conducted at *Hind Institute of Medical sciences, a Rural Medical College & Hospital, Safedabad Barabanki (UP)*.

All patients for hysterectomy having benign gynecological conditions, without prolapse e.g. DUB, Leiomyoma, Adenomyosis, and PID etc. were included in the study for a period of three years from Jan 2009 to Dec 2011.

Inclusion criteria for vaginal hysterectomy were mainly, uterine size not exceeding 14 weeks and having adequate access with good uterine mobility.

Exclusion criteria included uterus with severely restricted mobility, Suspicion of malignancy, complex adnexal mass and size more than 14 weeks.

Those patient who were not fulfilling the inclusion criteria for vaginal hysterectomy, underwent

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abdominal hysterectomy. Cases having suspicion of adnexal mass clinically were evaluated by TVS also.

Detailed history and thorough clinical examination was done in each case. A written informed consent was taken in all the cases with prior counseling of the possibility of conversion to abdominal hysterectomy if needed. After giving anesthesia all cases were reassessed in Operation Theater, to see the size & mobility of uterus and the condition of the adnexa on both sides.

METHOD OF OPERATION

All cases were performed under regional anesthesia either spinal or epidural. After cleaning & draping, cervix was held with volsellum and vigorous massage was done through both lateral fornices, which facilitated the uterocervical descent.

Saline infiltration (with 15-20ml) was done anteriorly in vesico-cervical plane and posteriorly in cervico vaginal plane in all cases and circumferential incision was made around the cervix. Pubovesicocervical ligament was cut and bladder was mobilized upwards. Both anterior and posterior pouches were opened one after another. Mackenrod’s and uterosacral ligaments were clamped, cut and ligated on both side. Then clamping of uterine vessels was done bilaterally followed by morcellation techniques in bigger sized uterus (like Bisection, Myomectomy with bisection and/or Debulking). In total hysterectomy, last clamp was applied on round ligaments, ovarian ligaments and medial part of the fallopian tubes and in cases of salpingo-oophorectomy, round ligament was clamped separately followed by clamping of infundibulopelvic ligaments. After delivery of the uterus hysterectomy was completed in usual manner. Data regarding age, parity, size of uterus, time of operation, complications and hospital.

stay was recorded. All patients were given antibiotic coverage. Catheterization with Foley’s catheter was done in all cases for 24-48hours.

RESULT

Hysterectomies were carried out during the study period for 122 patients. In which 112 cases were done through vaginal route and 10 by abdominal route. (Table – 01)

Table 1. Hysterectomy from Jan 2009 to Dec 2011.

S. No.	Type of hysterectomy	No.
01	Total no of hysterectomy	122
02	Vaginal hysterectomy	112
03	Abdominal hysterectomy	10

Table -02 shows various indications for NDVH, including dysfunctional uterine bleeding (41.07%) the commonest indication, followed by fibroid (25%), adenomyosis (14.3%) and pelvic inflammatory diseases (8.03%). In abdominal hysterectomy fibroid was the commonest indication followed by complex adnexal mass. Table – 03 shows distribution of cases according to the age. Sixty cases (53.58%) were in the age group of 41-45 yrs and only eight cases (7.14 %) were above the 50 yrs of age.

Table 2. Indications for NDVH

S. No.	Indication	No of Patient	Percentage
01	Dysfunctional uterine Bleeding.	46	41.07%
02	Fibroid	28	25.0%
03	Adenomyosis	16	14.3%
04	Chronic PID	09	8.03%
05	Cervical Factors (CIN)	08	7.14%
06	Ovarian cyst	03	2.7%
07	Previous surgery with DUB	02	1.78%

Table 3. Age wise distribution

S. No.	Age group(Yrs)	No of Patient	Percentage
01	35-40	28	25.00%
02	41-45	60	53.58%
03	46-50	16	14.28%
04	>50	08	7.14%

Sixty cases (53.58%) had parity three having favourable factor for vaginal route of surgery, i.e. vaginal laxity. Followed by parity two and four respectively (Table – 04).

Table 4. Parity wise distribution

S. No.	Parity	No of Patient	Percentage
01	Nulliparous	02	1.78%
02	One	06	5.35%
03	Two	37	33.03%
04	Three	60	53.57%
05	Four	07	6.2 %

Table 5. Morcellation - Technique

S. No.	Technique	No of Patient	Percentage
01	No morcellation	64	57.14%
02	Bisection	38	33.92%
03	Myomectomy with bisection	06	5.35%
04	Debulking	04	3.57%

Table – 05 Shows different techniques to reduce the size of uterus to facilitate the surgical removal of bigger size uterus. Different morcellation techniques were employed successfully in 48 patients (42.85%). Bisection was used most frequently (33.92%).

Hysterectomy was done for 68 cases (60.71%) and hysterectomy with bilateral salpingo-oophorectomy was done for 41 cases (36.60%) followed by hysterectomy with unilateral salpingo-oophorectomy in 3 cases (2.67%). (**Table – 06**)

Table 6. Type of operation

S. No.	Type	No of Patient	Percentage
01	Hysterectomy	68	60.71%
02	Hysterectomy with Bilateral salpingo-oophorectomy	41	36.60%
03	Hysterectomy with unilateral salpingo-oophorectomy	03	2.67%

Table 7. Peroperative- complications

S. No.	Complications	No of Patient	Percentage
01	Uneventful	94	83.92%
02	Difficulty in opening posterior pouch	08	7.14%
03	Primary hemorrhage	06	5.35%
04	Bladder injury	02	1.78%
05	Conversion to abdominal route	02	1.78%

Table – 07, Surgery was uneventful in 94 cases (83.92%). Difficulty was encountered in opening the posterior pouch in 8 cases (7.14%). Excessive bleeding during surgery was present in 6 cases (5.35%) and required blood transfusion. There was bladder injury in 2 cases (1.78%), however immediate repair of bladder was done successfully. Two patients needed conversion to abdominal route, one for slippage of uterine pedicle and other was due to inaccessibility of left adnexa.

Most of the patients (76.8%) had uterine size of 6-8 weeks and only 3.6% patient had uterine size more than 12 weeks. (**Table – 08**)

Table 8. Size of uterus

S. No.	Size of the uterus	No of Patient	Percentage
01	6-8 weeks	86	76.8%
02	10-12 weeks	22	19.6%
03	12-14 weeks	04	3.75%

Operation could be completed in most of the cases in 40-50 minutes (75%), and were discharged in 4-5 days. (**Table – 09**)

Table 9. Operative - Time

S. No.	Time	No of Patient	Percentage
01	35 min to 40 min	06	5.35%
02	40min to 50 min	84	75.0 %
03	> 50 Min	22	19.64%

DISCUSSION

The aim of this study was to determine the benefits of vaginal hysterectomy for non descent uterus versus abdominal hysterectomy. The indications for vaginal hysterectomy in this study were, DUB, Fibroid uterus, Adenomyosis & PID etc and similar indications for hysterectomy have been reported by others¹⁻².

Dorsey JW etal³ reported that no patient with uterus more than 12 weeks underwent vaginal hysterectomy but 30.6% with uterus more than 12 weeks were operated by laparoscopic assisted vaginal hysterectomy (**LAVH**).

In the present study in 3.6% cases hysterectomy was carried out for about 14 weeks size uterus through vaginal route, but prior reduction of size was done by different morcellation techniques.

As larger size of the uterus has been found to be a major hindrance to the approach through the vaginal route^{1,2,3,4}, different authors have described various techniques to reduce the size of the uterus prior to removal through the vagina. *Adam Magos* et al⁵ selected women with fibroid uterus between 14-20 weeks size and described bisection, myomectomy, morcellation and coring to reduce the uterine size.

Vaginal uterine morcellation is the key to a successful operation and obviates the need for either abdominal or laparoscopically assisted hysterectomy solely to deal with moderate uterine enlargement^{6,7}.

Uterine morcellation at the time of vaginal hysterectomy is safe and facilitates the removal of moderately enlarged and well supported uteri and is associated with decreased hospital stay and per operative morbidity rate compared with the abdominal route⁸.

Simple adnexal mass up to 6cm and mild to moderate endometriosis was not associated with any increased risk⁹. It has been demonstrated that ovaries are visible and accessible to transvaginal removal in most cases¹¹. Bilateral salpingo-oophorectomy at the time of vaginal hysterectomy was not independently

associated with operative time or blood loss¹⁰. In our study bilateral salpingo-oophorectomy was done for 36.6% of cases.

Lower segment caesarean section and nulliparity has been reported to impede vaginal surgery due to lesser laxity of the uterine ligamental support and narrower vagina². However in our study two patients with previous LSCS and two nulliparous women, underwent vaginal hysterectomy successfully. Sheth¹² reported a very low incidence of bladder injury (0.1%) - According to him access to the uterovesical pouch can be obtained through the uterocervical - broad ligament space without laparoscopic assistance and without bladder trauma. In our case bladder injury in two cases (1.78%), repaired peroperatively without any urinary morbidity after discharge from the hospital.

CONCLUSION

Vaginal hysterectomy is safe, feasible and patient friendly in most of the women requiring hysterectomy for benign conditions and should therefore be attempted. The short term clinical outcome in VH is superior to TAH. Vaginal hysterectomy should be a primary method for removal of uterus, if not contraindicated.

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A Potential Role of Apo B in the Risk Stratification of Type 2 Diabetic Patients with Dyslipidemia

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ABSTRACT

Background: Dyslipidemia matters in type 2 diabetes and appreciation of the lipid abnormalities in diabetes has changed with time. There are few data on Apo B levels in these patients and consequently there is little information on the frequencies of the various dyslipidemic phenotypes.

Methods: Plasma lipids and Apo B were measured by standardized methods. The patients were categorized by two different methods. The first was based on triglyceride (<150mg/dl) and LDL cholesterol (<100mg/dl), and the second was based on triglyceride (<150mg/dl) and Apo B (<137mg/dl).

Results: As overall, plasma triglycerides were elevated, total and LDL cholesterol were normal and HDL was decreased. Results of the phenotyping analysis were, using the conventional approach; only 20% has elevated LDL cholesterol. Using the new approach, 63% has an elevated Apo B and therefore an elevated LDL particle number. The mean LDLc for hypertriglyceridemic-hyperapo B group was 120.4mg/dl, whereas the mean Apo B for the same was 239mg/dl, indicating its significance over LDL cholesterol.

Conclusion: Diagnosis based on triglycerides and Apo B revealed more number of patients with atherogenic, dyslipidemic status rather than by diagnosing on triglycerides and LDL cholesterol levels. Apo B is a better cardiovascular risk marker and can replace LDL cholesterol in maintaining statin therapy in type 2 diabetic patients.

Keywords: : Apo B, Dyslipidemia, Cardiovascular Risk, Type 2 diabetes,

INTRODUCTION

Diabetic patients are vulnerable to different lethal diseases including cardiovascular disease, which is still ranked as the number one killer disease in the world¹. Diabetes is not just dysglycemia; particularly type 2 diabetes is also dyslipidemia². Dyslipidemia that frequently occur in type 2 diabetes might play a critical role in producing the accelerated macro vascular atherosclerotic disease, that is, unfortunately, so common. Their features need to be understood in detail³.

Recent studies have shown that the lipid abnormalities associated with diabetic dyslipidemia begin to develop prior to the clinical onset of type 2 diabetes, at a time when blood glucose concentrations are relatively normal. It followed that the implementation of effective antihyperlipidemic

treatment to the diabetic population requires an intensive approach¹.

In diabetes, given the frequency of hypertriglyceridemia, small dense Low Density Lipoproteins (LDL) are common and their feature is now generally included in the definition. It is still not widely appreciated that not only is LDL composition altered in patients with type 2 diabetes, but LDL particle number is frequently increased as well, the combination resulting in hypertriglyceridemia, hyper Apolipoprotein B, one of the commonest, most atherogenic dyslipoproteinemias². Apo B is the major apolipoprotein of Very Low Density Lipoprotein (VLDL), Intermediate Density Lipoprotein (IDL) and LDL particles. In line with non- High Density Lipoprotein (Non-HDL), plasma levels of Apo B represent all atherogenic lipoproteins in the circulation;

however because every atherogenic particle contains a single Apo B molecule, Apo B levels also provide an accurate reflection of the number of atherogenic particles⁴.

The Quebec cardiovascular study is the most up to date, prospective, epidemiologic investigation of the risk factors responsible for coronary artery disease. It is also the first study in which Apo B was measured in all subjects, and it is worth noting that Apo B was found to be the single most important lipid parameter for influencing outcome⁵. Not only is Apo B a better index than LDL cholesterol (LDL c) to predict risk, it is also a more accurate guide to the adequacy of statin therapy⁵. Because there is one Apo B molecule per

particle of LDL, IDL, and VLDL, total Apo B levels highly correlate with non-HDL cholesterol levels. Non-HDL cholesterol provides the total cholesterol of LDL, IDL, VLDL, but Apo B reflects the total particle number in these lipoproteins⁶. Although growing evidence suggests that non-HDL c, and Apo B are stronger predictors of Cardio Vascular Disease (CVD) than LDL c alone in the general population, epidemiologic data among diabetic individuals are limited.

Hence we conducted a prospective study to determine the prevalence of dyslipidemic phenotypes, including Apo B in type 2 diabetic patients and consequently to evaluate their cardiovascular risk.

Table 1. Characteristics of the cohort

Criteria	Total	Women	Men	P-value
n	150	53	97	
Age(yrs)	52.5	52.5	52.5	
Total cholesterol(mg/dl)	204	205	194	HSP<0.001
Triglycerides(mg/dl)	233	236	235	HSP<0.001
LDL cholesterol(mg/dl)	101.6	101.6	104.9	HSP<0.001
HDL cholesterol(mg/dl)	38	38	38	HSP<0.001
Apo B(mg/dl)	220.6	229	208.3	HSP<0.001
BMI(kg/m ²)	31.5	32	31.8	HSP<0.001

Data are means(SD)

Table 2. Variables by triglycerides/Apo B phenotype

	Hypertriglyceri de-hyper apo b	Hypertriglyceri de-normo apo b	Normotriglyceride mic-hyper apo b	Normotriglyceride mic-normo apo b	P
Total cholesterol (mg/dl)	201.2	245.8	182.7	187.4	HSP<0.001
Triglyceride (mg/dl)	246.7	274.5	138	130	HSP<0.001
LDL (mg/dl)	120.4	105	111	136	HSP<0.001
HDL (mg/dl)	37	37.8	38	39.4	HSP<0.001
Apo B (mg/dl)	239	111.6	168	108.7	HSP<0.001
BMI (kg/m ²)	32.4	31.7	31.1	29.5	HSP<0.001

Data are means(SD)

MATERIALS AND METHODS

A total of 150 type 2 diabetes patients were selected from medicine clinic aged between 35 and 70 yrs. The study was conducted at Sree Siddhartha Medical College and Research Centre, Sree Siddhartha University, Tumkur, Karnataka. Type 2 diabetic patients under medication that affect lipoprotein metabolism were excluded from this study. The protocol was approved by the local ethical committee of our hospital and patients gave their informed consent.

The clinical data was collected. Anthropometric measurements were taken and BMI (kg/m²) was calculated. Blood samples were obtained after an

overnight fast (10-12 hrs). The blood was left at room temperature for 30min and the serum was separated. Total cholesterol (Tc), Triglyceride (Tg), HDL-c and Apo B were immediately analysed from total serum. Tg and Tc were measured by commercially available fully enzymatic method. HDL -c was measured directly by a commercial kit by an end point method. Serum LDL-c was measured indirectly using the following equation.

$$[LDL-c] = [Tc] - [(HDLc + TG/5)]$$

The factor [TG/5] is an estimate of VLDL c concentration and is based on the average ratio of TG to cholesterol in VLDL. Serum Apo B was measured by an end point method, using commercial kit. The

reference values are provided now for Apo B. The patients were categorized into four groups based on triglyceride and Apo B levels, and were also divided into four groups based on LDLc and triglyceride levels.

Statistical analysis: student's t test was performed as the test of significance. $P < 0.05$ was considered statistically significant.

RESULTS

Of the 150 subjects, 97(64.66%) were men and 53(35.33%) were women. None were taking any medication that was known to affect lipoprotein levels. The features of the cohort are shown in table 1. Obesity was a common factor. There were no significant differences between males and females. The mean values for Apo B and lipids are shown in Table 1. Total and LDL cholesterol were normal, triglycerides were elevated, and HDL cholesterol was decreased. The average Apo B is discordant with the average LDL cholesterol, thus suggesting that small LDL particles are present.

In our study, dyslipidemia was more pronounced in women than men, as evidenced by significant increase in total cholesterol, triglyceride and Apo B. But the average HDL cholesterol was same in both men and women.

Based on plasma triglyceride and LDL-c, the cohort was divided into four phenotypes, normal, normal triglyceride-increased LDLc, increased triglyceride-normal LDLc, and increased triglyceride- increased LDL. Using the conventional classification, these correspond to normal, type IIA hypercholesterolemia, type IV hyperlipoproteinemia, and type IIB or combined hyperlipidemia³.

These findings were compared with those obtained with phenotypes based on triglyceride and Apo B. There were four phenotypes again, normal, normotriglyceride- hyper Apo B, increased triglyceride- normo Apo B, and increased triglyceride-increased Apo B.

Figure 1 A shows the phenotype frequencies based on triglyceride and LDL c, whereas Fig 1B shows the phenotype frequencies, which are based on triglyceride and Apo B. Using the conventional approach, 30% were normal, 03% had type IIA, 50.0% had type IV hyperlipoproteinemia, and 17% had IIB. In total 20% had abnormal LDL, evidenced by increased LDL c.

The corresponding results using triglyceride and Apo B, 18% were normal, 13% were normotriglyceridemic-hyper Apo B, 50% were hypertriglyceridemic- hyper Apo B, 19% were hypertriglyceridemic-normo Apo B. In total, 63% had

hyper Apo B.

Thus, the conventional approach suggested that only 20% had abnormal LDL, and the approach based on Apo B indicated that 63% had hyper Apo B, suggesting that small dense LDL particles are present. Hence, it is a better approach, to evaluate the small LDL particles.

The lipids, Apo B and BMI results for the phenotypes based on the triglyceride and Apo B group are depicted in table 2. The results for the normal group for lipids and Apo B were well within normal limits. In both hypertriglyceridemic groups, HDL was reduced. The mean LDL cholesterol for hyper triglyceridemic- hyper Apo B group was 120.4 mg/dl. In contrast the mean Apo B for the same group was 239mg/dl, indicating its significance over LDL cholesterol.

DISCUSSION:

A history of diabetes is equivalent in risk for death to a history of myocardial infarction, and the combination compounds the risk⁷. The United Kingdom Prospective Diabetic Study found that better glycaemic control reduced the frequency of microvascular disease, but the trend toward a reduced frequency of macrovascular disease was not statistically significant. In addition, the frequency of macrovascular disease in patients with type 2 diabetes varies geographically, suggesting that factors like dyslipoproteinemias play an important role in the pathogenesis of the vascular disease⁷.

LDL particles in diabetic patients are more likely to be glycated, and in vitro studies indicate that glycated LDL particles are more likely to be oxidised. The collagen and elastin within the arterial wall are also more likely to be glycated; in vitro studies suggest that such changes are likely to entrap LDL particles that enter the vessel wall. Thus, diabetes may magnify the atherogenic potential of dyslipoproteinemias⁷. The combination of hypertriglyceridemia, hyper Apo B, increased number of small, dense LDL particles, and low levels of HDL- cholesterol, the atherogenic lipoproteins profile is not restricted to persons with type 2 diabetes mellitus; it is also common in persons with insulin resistance, those who will develop diabetes, and those with coronary disease⁷.

Apo B synthesis is required for the hepatic secretion of VLDL, and Apo B remains associated with the particle during the triglyceride hydrolysis and lipid exchange cascade until its clearance from the circulation as IDL or LDL particles. Measuring Apo B in plasma is roughly equivalent to quantifying the number of Apo B containing lipoproteins secreted by

the liver, because there is systematically only one Apo B molecule per particle secreted⁸. The amount of cholesterol per LDL particle can vary substantially; LDL cholesterol is not a reliable index of LDL particle number⁷. Of the total Apo B, >90% are LDL particles or more precisely, IDL and LDL particles, as LDL cholesterol is the sum of the cholesterol in the IDL and LDL fractions. This remains true even in hypertriglyceridemia; therefore, total plasma Apo B is a reliable surrogate for LDL particle number⁷.

Much more attention in type 2 diabetes has been paid to VLDL and HDL particles than to LDL particles. The major findings of our study oppose this view. In the present study, 63% of our patients had hyper Apo B and therefore elevated LDL particle number. In contrast, based on conventional LDL cholesterol approach, only 20% of our cohort had increased LDL cholesterol, a major difference for the therapeutic outcome. The present study supports the reports of Wagner et al⁹, who were the first to study dyslipidemic phenotypes in type 2 diabetes, incorporating Apo B. Studies have shown that small dense LDL particles are common in type 2 diabetes⁷ and that Apo B levels, on average, are elevated in type 2 diabetes⁹. The overall results of our study are in accord with other reports.

There is abundance evidence from case control reports to support the role of Apo B as an important risk factor for Ischemic Heart Disease (IHD). Prospective data from the British United Provident Association study showed that Apo B was most strongly associated with IHD even after adjustment for total cholesterol and triglyceride levels in the multivariate analysis⁸. In youth with type 1 diabetes, elevated Apo B and dense LDL are not highly prevalent, whereas elevated Apo B and dense LDL were common lipoprotein abnormalities in youth with type 2 diabetes¹⁰. The intensive lipid lowering therapy targeted to patients with elevated Apo B levels not only diminished the rate of progression of coronary artery disease but also induced a net regression in angiographically determined coronary lesions⁸. Taiwanese type diabetic patients – suggests that Apo B containing lipoproteins could also initiate early glomerular injury leading to incipient diabetic nephropathy with micro albuminuria¹¹. It is arguably, even more urgent to implement apoproteins into the c and Apo B in relation to cardiovascular event occurrence, the current literature consists primarily of a series of epidemiological studies, both Non- HDL c and Apo B were found to be more accurate risk predictors than LDL c, Apo B being superior⁴.

Apo B is an extension of what came before, a more precise and more practical measure to improve clinical practise and treatment outcomes¹². We do not fully

assess the lipoprotein status of patients with type 2 diabetes if Apo B is not measured. That means we will assess risk less well and will likely treat patients less effectively¹³. One management options for high risk patient is to measure Apo B during statin therapy to make sure that the total number of atherogenic particles is reduced¹⁴.

Statins are becoming an increasingly popular therapy for patients with type 2 diabetes because their LDL cholesterol levels, although normal, are above target levels³. The treatment of the dyslipidemia of the metabolic syndrome should be focused on lowering LDL c and Apo B and increasing HDL. The percent reduction in LDL c and Apo B by statin medications is similar, but Apo B may be a better marker of treatment efficacy in metabolic syndrome patients with normal LDL cholesterol¹⁵. For highest risk individuals those with known clinical CVD and those who do not have clinical CVD but who have diabetes and one or more other cardio metabolic risk factors beyond their dyslipidemia, the recent ADA/ACC consensus statement suggested a target level of LDL c <70mg/dl, Non-HDL c <100mg/dl, and Apo B <80mg/dl¹⁶.

Apo B will be particularly useful in assessing patients who are hypertriglyceridemic, with either mixed hyperlipidemia or as an isolated abnormality. Thus, Apo B should be measured in dyslipidemias associated with metabolic syndrome, obesity, type 2 diabetes, chronic kidney diseases and familial hyperbetalipoproteinemia, since all such patients have elevated plasma Apo B¹⁷.

In line with recently adopted Canadian guidelines, the addition of Apo B represents a logical next step to National Cholesterol Education Program Adult Treatment Panel III (NCEPATP III) and other guidelines in US. It appears prudent to consider, using Apo B along with LDL c to assess LDL related risk for an in term period until the superiority of Apo B is generally recognised¹⁸.

To conclude, the abnormalities in LDL composition are frequently present in patients with type 2 diabetes, and the extent of which is evident only if Apo B is measured in addition to the standard lipid profile. Apo B is a better cardiovascular risk marker and can replace LDL cholesterol in maintaining statin therapy in type 2 diabetic patients.

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Anabolic- Androgenic Steroids : The Antidoping Perspective

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ABSTRACT

Since ancient times, unethical athletes have attempted to gain an unfair competitive advantage through the use of doping substances. Doping with endocrine drugs is quite prevalent in amateur and professional athletes. The World Anti-Doping Agency (WADA) has a list of banned drugs for athletes who compete and a strategy to detect such drugs. A substance or method might be included in the List if it fulfills at least two of the following criteria: enhances sports performance; represents a risk to the athlete's health; or violates the spirit of sports. This list, constantly updated to reflect new developments in the pharmaceutical industry as well as doping trends, enumerates the drug types and methods prohibited in and out of competition. From all these, Anabolic- Androgenic steroids (AAS) constitute by far the highest number of adverse analytical findings reported by antidoping laboratories. The use of different derivatives of AAS is growing among adolescent athletes throughout the world. In India the detection of these substances is quite intricate due to the cost of testing and non availability of many accredited labs. This article will overview the use of AAS as doping substances in sports, focusing mainly on the different depravities AAS available in Indian market, schedules of AAS administration ,possible side effects of AAS , physical symptoms of AAS in user and counseling strategies to the current fight against doping.

INTRODUCTION

The creed of the Olympics states: "The important thing in the games is not winning but taking part. The essential thing is not conquering, but fighting well". As noble a goal as this is, it has little to do with the reality of the modern sports world. Will the Olympic ideal survive, or will it be lost in a sea of hormone, steroid and stimulant abuse?

Sports success is dependent primarily on genetic endowment in athletes with morphologic, psychologic, physiologic and metabolic traits specific to performance characteristics vital to their sport. Such genetically endowed athletes must also receive optimal training to increase physical power, enhance mental strength, and provide a mechanical advantage. However, athletes often attempt to go beyond training and use Pharmacological agents in attempts to gain a competitive advantage. There are literally hundreds.

Doping is now a global problem that follows international sporting events worldwide. International sports federations, led by the International Olympic Committee, Governments and Non Governments agencies of different countries have for the past half century attempted to stop the spread of this problem,

with little effect. In fact, new, professional athletes now abuse more powerful and undetectable doping techniques and substances assisted by sophisticated networks of distribution have developed.

Professional athletes are often the role models of adolescent and young adult populations, who often mimic their behaviors, including the abuse of drugs. This is primarily due to the amount of money associated with winning in today's sports industry. Multimillion-dollar contracts, appearance fees, international endorsement and sports merchandising represent a billion dollar industry that offers today's athletes, their sponsors and entourage previously unheard of financial gains. In addition, male and female adolescents are now abusing these drugs for cosmetic purposes in an attempt to achieve the "cut" and sexy look promoted by the media.

Today performance-enhancing programs and drugs are not the exclusive province of elite athletes, but have spread to health clubs, high schools and other at-risk populations, creating an over \$ 4 billion US dollar industry that is growing daily as new compounds are synthesized and marketed¹. The serious side effects of steroids described in the medical literature include liver function abnormalities, liver

and kidney tumors, endocrine and reproductive dysfunctions, testicular atrophy, lipid and cardiac effects and psychiatric symptoms².

WHAT ARE ANABOLIC-ANDROGENIC STEROIDS?

“Anabolic Steroids” are any drug(s) (other than estrogens, progestins, and corticosteroids) or hormonal substance(s), chemically related to testosterone, a male hormone that promotes the growth of skeletal muscle (anabolic effects) and the development of male sexual characteristics (androgenic effects) in both males and females. Today, there are more than 100 varieties of anabolic steroids that have been developed, but only a limited number have been approved for human or veterinary use³.

Testosterone is produced naturally in both men and women, particularly by the male testicles and other organs and tissues in females. The circulating blood level of testosterone in females is 10% that of their male counterparts. Testosterone circulates throughout the body and interacts with specific receptors on cells to initiate the proper development of the male sexual characteristics (male features, hair, genitalia) as well as the proper function of many other tissues and organs in the body⁴. Because of their chemical similarity to testosterone, all anabolic steroids interact with the same cell receptors and produce effects in all organs and tissues, including the brain, heart, liver, skin, muscles, bone, bone marrow, blood vessels, skin, hair, the genitals and reproductive organs⁵.

AAS were developed in the late 1930s primarily to treat hypogonadism, a condition in which the testes do not produce sufficient testosterone for normal growth, development, and sexual functioning. During the 1930s, scientists discovered that anabolic steroids could facilitate the growth of skeletal muscle in laboratory animals, which led to abuse of the compounds first by bodybuilders and weightlifters and then by athletes in other sports⁴. Illicit steroids are often sold at gyms, competitions, and through mail order operations after being smuggled from countries that do not require a prescription for the purchase of steroids¹.

WHAT ARE STEROIDAL SUPPLEMENTS?

Steroidal supplements can be converted into testosterone or a similar compound in the body. Androgens *Testosterone* is secreted by the interstitial (Leydig) cells of the tests under the influence of Luteinising Hormone from pituitary gland. Testosterone is responsible for all the changes that occur in the body at puberty. Anabolic steroids are synthetic androgens with higher anabolic and low androgenic activity. Anabolic steroids were developed with the idea of avoiding virilizing side effects of androgens while retaining the anabolic effects. They tend to increase retention of nitrogen, calcium, sodium, potassium, chloride and phosphate, leading to an increase in skeletal weight, water retention and increased growth of bone.

**Commonly Abused Anabolic Androgenic Steroids in India⁷
Androgens (Testosterone) Injectable**

Trade Name	Salt	Prepared by (Company)
Aquaviron	Free Testosterone & Thiomersal	Nicholas
Sustanon (100 & 250mg)	(Testosterone Proinate + Testosterone Phenylpropionate+ Testosterone Isocaproate+ Testosterone Decanoate)	Infar
Testanon (25 & 50mg)	Testosterone Proinate	Infar
Testoviron Anabolic Oral Steroids	Testosterone Proinate	German Remedies
Adroyo	Oxymetholone	Parke-Davis
Menabol	Stanozolol	CF Pharma
Neurabol	Stanozolol	Cadila
Orabolin Anabolic Injectable Steroids	Ethylestrenol	Infar
Biodebol	Nandrolone Decanoate	Biochem
Decadurabolin (25,50&100mg)	Nandrolone Decanoate	Infar
Docabolon	(Nandrolone Phenylpopionate + Desoxy Corticosterone Phenylpopionate)	Infar
Evabolin	Nandrolone Phenylpopionate	Concept
Metadec (25 & 50 mg)	Nandrolone Decanote	Jagsonpal

How are AAS abused?

There are about more than 40 different derivatives of testosterone that make up the list of available AAS⁹. Basically anabolic androgenic steroids come in three forms:

- a) C-17 alkyl derivatives of testosterone
- b) Esters (or derivatives) of 19 – nortestosterone
- c) Esters of testosterone

The C-17 alkyl derivatives of testosterone are water soluble and can be taken orally. Their clearance time (time athlete needs to pass traces of these drugs from the body) are usually 3 to 4 weeks but the recent advancement in the detection techniques has made it possible to detect for longer period (4-6 weeks). Where as esters of 19 – nortestosterone are oil-based, fat soluble and active when injected into the body. They are absorbed by the body's fat deposits, where long term energy is been stored. The most popular Anabolic Androgenic Steroid is Nandrolone and which is stored in the fat tissue of the body and released over a longer period, it can some time take 12-18 months to clear the athlete's system³.

SCHEDULE OF ABUSE

Steroids are often abused in patterns called "cycling," which involve taking multiple doses of steroids over a specific period of time from 4 to 18 weeks, stopping for a period, and starting again. Users also frequently combine several different types of steroids in a process known as "stacking." Steroid abusers typically "stack" the drugs, meaning that they take two or more different anabolic steroids, mixing oral and/or injectable types, and sometimes even including compounds that are designed for veterinary use. Abusers think that the different steroids interact to produce an effect on muscle size that is greater than the effects of each drug individually, a theory that has not been tested scientifically⁸.

Another mode of steroid abuse is referred to as "pyramiding." This is a process in which users slowly escalate steroid abuse (increasing the number of steroids or the dose and frequency of one or more steroids used at one time), reaching a peak amount at mid-cycle and gradually tapering the dose toward the end of the cycle. Often, steroid abusers pyramid their doses in cycles of 6 to 12 weeks. At the beginning of a cycle, the person starts with low doses of the drugs being stacked and then slowly increases the doses. In the second half of the cycle, the doses are slowly decreased to zero. This is sometimes followed by a second cycle in which the person continues to train but without drugs. Abusers believe that pyramiding allows the body time to adjust to the high doses, and

the drug-free cycle allows the body's hormonal system time to recuperate. Doses taken by abusers can be 10 to 100 times higher than the doses used for medical conditions^{1,3}.

Possible Health Consequences of Anabolic Steroid Abuse

From the case reports, the incidence of life threatening effects appears to be low, but serious adverse effects may be under recognized or underreported, especially since they may occur many years later¹⁰. Data from animal studies seem to support this possibility.

HORMONAL SYSTEM

Steroid abuse disrupts the normal production of hormones in the body, causing both reversible and irreversible changes. Changes that can be reversed include reduced sperm production and shrinking of the testicles (testicular atrophy). Irreversible changes include male-pattern baldness, breast development (gynecomastia), Loss of sexual drive, decreased hormone levels, and increased risk for prostate cancer in men^{12,13,17}.

In the female body, anabolic steroids cause masculinization, decreased breast size, loss of body fat¹², skin becomes coarse, clitoris enlarges, irregular menstruation and the voice deepen. Women may experience excessive growth of body hair but lose scalp hair (hirsutism). Steroids can affect fetal development during pregnancy. With continued administration of steroids, some of these effects become irreversible^{13,17}.

MUSCULOSKELETAL SYSTEM

Rising levels of testosterone and other sex hormones normally trigger the growth spurt that occurs during puberty and adolescence and provide the signals to stop growth as well. When a child or adolescent takes anabolic steroids, the resulting artificially high sex hormone levels can prematurely signal the bones to stop growing and cause accelerated maturation in adolescents¹⁴. Increased risk of musculotendons injury has been reported in athletes.

CARDIOVASCULAR SYSTEM

Steroid abuse has been associated with cardiovascular diseases (CVD), including heart attacks and strokes, even in athletes younger than 30¹⁵. Steroids contribute to the development of CVD, partly by changing the levels of lipoproteins that carry cholesterol in the blood. Steroids, particularly oral steroids, increase the level of low-density lipoprotein (LDL) and decrease the level of high-density

lipoprotein (HDL). High LDL and low HDL levels increase the risk of atherosclerosis, a condition in which fatty substances are deposited inside arteries and disrupt blood flow¹⁶. If blood is prevented from reaching the heart, the result can be a heart attack. If blood is prevented from reaching the brain, the result can be a stroke. Steroids also increase the risk that blood clots will form in blood vessels, potentially disrupting blood flow and damaging the heart muscle so that it does not pump blood effectively.

LIVER

Steroid abuse has been associated with liver tumors and a rare condition called peliosis hepatis, in which blood-filled cysts form in the liver. Both the tumors and the cysts can rupture, causing internal bleeding. Elevations in levels of liver enzymes (aspartate aminotransferase, alanine aminotransferase, and lactate dehydrogenase) are common, and cholestatic jaundice has been reported in some studies^{12, 18, 22}.

SKIN

Steroid abuse can cause acne, cysts, and oily hair and skin¹⁰.

INFECTIONS

Many abusers who inject anabolic steroids may use nonsterile injection techniques or share contaminated needles with other abusers. In addition, some steroid preparations are manufactured illegally under nonsterile conditions. These factors put abusers at risk for acquiring life threatening viral infections, such as HIV and hepatitis B and C. Abusers also can develop endocarditis, a bacterial infection that causes a potentially fatal inflammation of the inner lining of the heart¹⁶. Bacterial infections also can cause pain and abscess formation at injection sites.

EFFECTS ON BEHAVIOR

Androgenic anabolic steroids, when used in high doses, increase irritability, mood swings (including manic-like symptoms leading to violence), Depression, delusions, Nervousness, Impaired judgment (stemming from feelings of invincibility), Hostility and aggression. Studies suggest that the mood and behavioral effects seen during anabolic-androgenic steroid abuse may result from secondary hormonal changes^{20,26}. A number of negative psychological effects, including "roid rage" (unprovoked aggression), have been observed in some users of AAS. Increased aggressiveness may be beneficial for athletic training, but may also lead to overt violence outside the gym or the track. There are reports of violent,

criminal behavior in individuals taking AS²⁴. Other side effects of AS are euphoria, confusion, sleeping disorders, pathological anxiety, paranoia, and hallucinations.

SOCIAL PROBLEMS

The AAS users always have a fear in their mind of disqualification from competition and disapproval by parents/coaches/peers²³.

IDENTIFYING ANDROGENIC ANABOLIC STEROIDS USERS

The cost of laboratory testing for the anabolic steroid use may prohibit testing a large population of athletes. Detection may involve the use of radioimmunoassay, gas chromatography, or mass spectrometry to identify metabolites of the AAS in the athlete's urine. Because of the complexities involved, each test costs approximately \$100 to 200²⁵. Coaches and physical education teachers can identify the AAS users through physical and psychological signs. The physical and psychological changes in individual resulting from anabolic steroid use are a function the duration of use, dosages consumed, and whether the individual is actively participating in a resistance exercise.

PHYSICAL SIGNS OF AAS USE

Physical Signs of Anabolic Steroid Use do not indicate steroid abuse when observed alone, however, when several of the signs of table - 2 are present, they may alert you for a possible abuse.

Table -2 Physical Signs of Anabolic Steroid Use

1. Rapid weight gain⁶
2. Increased blood pressure and cholesterol levels¹⁶
3. Insomnia
4. Headaches
5. Jaundice¹⁸
6. Frequent Injuries of ligament, tendons and muscle
7. Marked muscular hypertrophy with alterations in body composition
8. Severe acne
9. Gynecomastia (breast development)
10. Atrophic breasts and deepening of voice in females
11. Swelling of feet and ankles
12. Improved healing
13. Improved appetite
14. Blood clotting difficulties

15. Premature heart attacks and strokes¹⁵
16. Hirsutism (abnormal development of facial and body hair)
17. Clotting disorders
18. Reduced sexual functioning
19. Stunted growth in adolescents
20. Disproportionate development of the upper torso
21. Needle marks on large muscle groups

PREVENTION PROGRAMME

Informational programs that focus solely on the adverse side effects of steroids or use scare tactics have not proven especially effective¹⁹. Instead, programs that raise awareness of the risks, decrease social anxiety, and increase self-esteem and positive self-body image have yielded positive results²¹.

CONCLUSION

The most important aspect to curtailing abuse is to educate teachers, coaches, parents, and students about the dangerous and harmful side effects, and symptoms of anabolic steroids use. Athletes and others must understand that they can excel in sports and have a great body without steroids. They should focus on getting proper diet, rest, and good overall mental and physical health. Millions of people have excelled in sports and look great without steroids. Create an atmosphere of openness, team cooperation, and ethical responsibility in sporting activities, rather than cutthroat competition that may lead some students to use these desperate means. You can get stronger, faster, jump higher, and improve your physical appearance naturally. This has real benefits. By earning the results, one can develop good work habits, self-confidence and a true sense of achievement that will cross-over and lead to success in other areas of one's life, including personal, athletic, educational and professional.

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Sex Determination from Hand Dimensions in Indian Population

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ABSTRACT

Determination of sex from extremities plays an important role in identifying the deceased in forensic examinations. The dimensions of the hand have been used for the determination of sex, age and stature of an individual. The purpose of the present study was to determine sex by hand dimensions among 200 South Indian and North Indian subjects. Statistical analysis indicated that bilateral variations were insignificant for all measurements. The average hand length and breadth were found to be about 1 cm greater in males as compared to females. Hand index was calculated and has been used for the determination of sex. Hand index more than 42 was suggestive of males and less than 42 is that of females. These differences were insignificant when values were compared between subjects of the same sex in South Indian and North Indians.

Key words: : Sex, Hand dimensions, Determination, Indian population.

INTRODUCTION

Identification of an individual is the main objective of forensic investigations. Identification of an individual from dismembered, mutilated and fragmentary remains is a challenge to forensic experts; in such cases, complete identification becomes unlikely and partial identification assumes importance to proceed into further investigations (Tanuj Kanchan et al 2008). The primary factors that are helpful in the identification include age, sex and stature (Vij K 2001). Many factors like racial, ethnic and nutritional factors play an important role in human development and growth; therefore different nomograms become necessary for different population ((Srinivasan 2002). An attempt has been made in the present study to find out the gender difference in the hand dimensions and the hand index in South Indian and North Indian population using statistical considerations.

MATERIALS AND METHODS

The present study was undertaken in the Department of Anatomy, Sree Siddhartha Medical

College, Tumkur, amongst 200 right handed medical students, aged between 20-30 years after taking informed consent to participate in the study. The student population of Tumkur comes from all over India. The division of subjects into South and North Indians was based on their region of origin and taking into account other zonal divisions of India (Srinivasan 2002). The total sample consisted of 50 South Indian females, 50 South Indian males, 50 North Indian females and 50 North Indian males. All the subjects included in the present study were healthy and free from any apparent symptomatic deformity of the spine or foot.

In the present study, both hands of each individual were measured using sliding calipers in centimeters to the nearest millimeter. All the measurements were taken by single observer in order to avoid inter-observer bias.

To measure hand dimensions, subjects were asked to place their hands prone with fingers extended and adducted on a flat horizontal surface.

Length of hand was measured using sliding calipers (graduated in mm) as the straight distance between the midpoint of a line joining the two stylium (styloid process of radius and ulna) and dactylion (the lowest point on the anterior margin of the middle finger).

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Breadth of hand was measured using sliding calipers (graduated in mm) as the straight distance between metacarpal radiale (the most medially placed point on the head of second metacarpal on the stretched hand) and metacarpal ulnare (the most laterally placed point on the head of fifth metacarpal on the stretched hand). Measurements were taken to accuracy of 0.1 cm (Singh IP and Bhasin MK 1968). Hand index was calculated by dividing the hand breadth by hand length and multiplied by 100.

STATISTICAL ANALYSIS

Analysis was done using Statistical software namely SPSS 15, Stata 8.0, MedCalc 9.0. and Systat 11.0. The data were statistically analyzed to determine sex by measurements of hand.

RESULTS

Descriptive statistics for bilateral hand dimensions among South Indian and North Indian males and females are shown in Tables 1 and 2.

In table 1, mean values of hand length among South Indian and North Indian males was more than 19 and in females it was less than 18.

In Table 2, mean values of hand breadth among South Indian and North Indian males was more than 8 and in females it was less than 7.

Table 3 depicts the mean values of hand index. In South Indian and North Indian males, both right and left hand indices were more than 42. In South Indian and North Indian females, both right and left hand indices were less than 42.

Statistical analysis indicated that bilateral variation was insignificant for the measurements of hand length and breadth in both sexes. Hand dimensions on both sides were significantly greater ($p < 0.001$) in males when compared with females. No statistically significant differences were found in the mean hand dimensions of South and North Indian population when compared for the same sex.

Table 1. Measurements (cm) of Hand Length in Males and Females (n=200)

Study group	Hand length	Minimum	Maximum	Mean	SD
SIM	Right	16.90	21.50	19.44	1.13
	Left	17.10	21.00	19.38	1.02
NIM	Right	16.40	23.10	19.53	1.16
	Left	16.80	23.20	19.46	1.12
SIF	Right	14.60	19.80	17.47	1.00
	Left	14.50	19.80	17.47	1.01
NIF	Right	15.40	19.50	17.80	0.93
	Left	15.50	19.40	17.74	0.90

Abbreviations used in tables: South Indian males (SIM), North Indian males (NIM), South Indian females (SIF) and North Indian females (NIF).

Table 2. Measurements (cm) of Hand Breadth in Males and Females (n=200)

Study group	Hand Breadth	Minimum	Maximum	Mean	SD
SIM	Right	7.20	9.00	8.25	0.41
	Left	7.30	9.00	8.19	0.37
NIM	Right	6.90	9.40	8.28	0.46
	Left	7.00	9.00	8.17	0.43
SIF	Right	6.30	8.00	7.31	0.32
	Left	6.50	7.90	7.23	0.31
NIF	Right	6.50	8.60	7.33	0.43
	Left	6.60	8.40	7.27	0.41

Table 3. Bilateral Hand index in SIM, NIM, SIF and NIF (n=200)

Study group	Right Hand index (mean)	Left Hand index (mean)
SIM	42.53±2.46	42.32±2.17
NIM	42.46±2.26	42.03±2.09
SIF	41.95±2.49	41.47±2.48
NIF	41.25±2.46	41.02±2.22

DISCUSSION

Sometimes, fragments of soft tissues are found disposed off in the open, in ditches, or rubbish dumps, etc. and this material is brought to forensic pathologist for examination (Mant Keith A 1995). One of the important objectives of examination is identification. The present study was aimed to establish the correlation between hand index and sex.

The present study strongly confirms sexual dimorphism in the hand length and breadths as earlier studies reported that these are larger in the males than in the females. These findings were consistent with the study conducted by Krishan 2007 and Agnihothri et al 2008. An association of Y-chromosome with stature has been documented. In addition, age of puberty being two years later in males as compared with females gives them additional time for growth (Malek et al 1990).

Insignificant bilateral variation for the measurements of hand length and breadth in both sexes as found in the present study differed from that of Rastogi et al 2008 in which right-hand dimensions were larger than that of left hand. Statistically significant differences in the mean stature and hand dimensions of South and North Indian population when compared for the same sex are compatible with those arrived at by Rastogi et al 2008. This suggests that in persons of different population groups (belonging to the same race) geographical variations do not have much influence on body proportions.

Recent studies by Agnihothri et al 2008 and Danborn et al 2008 showed that there was a consistent difference in the range of hand index between males and females across ages 18-35 years. The present study which was also conducted in a similar age group (20-30 years) in South and North Indian population showed a slight deviation from their studies. In our study hand index in males was found to be more than 42 and in females, it was less than 42. Therefore, 42 can be used as a deviation point for the determination of sex. In the studies by Agnihothri et al 2008 conducted on Mauritius population, the deviation point was 44 and in Donborn's study on Nigerian population it was 47. In Indian studies by Kanchan T et al 2009 the sex differences were found to be statistically significant only for the hand index on the left side and morphometric parameters of the hand showed considerable sexual dimorphism while the hand index remained poor sex indicator. In contrast the present study indicated a positive correlation between an individual's hand dimensions including the hand index and gender. These sex differences were statistically significant bilaterally. Thus sex can be

determined by hand index with fair accuracy. The results of this study are however applicable only when an intact hand examined.

CONCLUSION

Determination of sex of an individual from the mutilated or amputated limbs plays a conspicuous role in facilitating personal identification in incident of murder, accidents or natural disasters. In the present study it is concluded that hand index is highly reliable for the determination of sex in forensic examinations and anthropological studies. The study thus has medicolegal implications when a dismembered hand is brought for examination.

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A Prospective Randomised Study of Comparative Analysis of Conventional Simple Closure of Abdomen Versus Mesh Zipper Technique Closure In Exploratory Laparotomy for Peritonitis

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ABSTRACT

The concept of "open abdomen" particularly in patients with delayed generalized peritonitis, where closure is difficult and may precipitate abdominal compartment syndrome, has been reviewed in many articles recently. Since most arguments still support the effectiveness of this method and the results have been mostly favourable, we had compared the results of mesh-zipper laparostomy with conventional closure of abdominal wall. Patients with poor general condition with high APACHE II score and when closure of abdominal wall was difficult especially if it was leading to raised intra abdominal tension, were included in mesh zipper technique group. In these patients commercial zippers with mesh were used on all. We analyzed 28 patients of peritonitis, divided in two different groups of 14 each.

Key words: Mesh - Zipper technique; Generalized peritonitis; Residual abscess; APACHE II scores.

INTRODUCTION

The treatment of peritonitis is multidisciplinary, with complimentary application of medical, operative and non-operative interventions. Early control of the septic source is mandatory. Staged abdominal repair had been used in patients with intra-abdominal infections¹. Despite many technical advances in surgery, mortality from severe abdominal sepsis remains unacceptably high². The reason for high mortality may be unsatisfactory drainage of the peritoneal cavity, residual sepsis or multiple organ failure. In an effort to reduce the mortality, various surgical procedures like continuous peritoneal lavage³, staged laparotomy⁴ and radical peritoneal debridement⁵ have been tried previously. In recent years several authors have used an open abdomen technique using a 'zipper', with or without a mesh with promising results^{6,8}. In effort to reduce the mortality, we have used mesh laparostomy and compared it with conventional closure of abdominal wall in APACHE II score patients.

MATERIALS AND METHODS

This study had been conducted in School of Medical Sciences & Research, Greater Noida after obtaining the

permission from the institutional ethical committee. This is a prospective analysis of two different techniques of closure of abdomen in case of exploratory laparotomy conducted for peritonitis, admitted during a period of one year from January 2009 to December 2009. All the patients, who underwent exploratory laparotomy, were divided into two groups. In one group simple closure of abdomen was done where as in the second group closure was done by putting a mesh with attaching a zip to it. The criteria for mesh & zipper application were:

1. Patients in whom adequate elimination of the toxic source and the infectious source was not possible.
2. Compromised anastomosis or impending perforation.
3. Patients with poor general condition with high APACHE II score.
4. Closure was difficult and intra abdominal tension was raised.

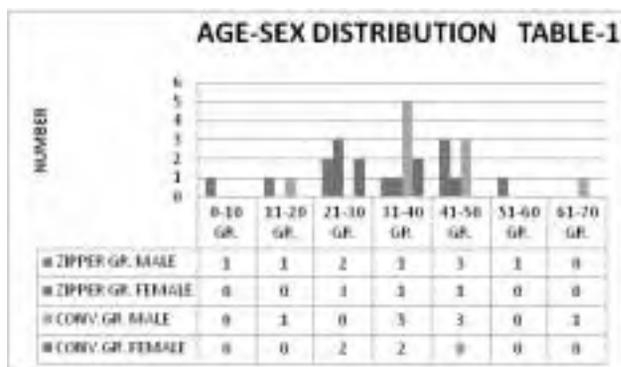
All the patients were resuscitated in the emergency. Exploration was done with midline incision under general anaesthesia. Intra peritoneal collections were taken for culture and sensitivity. After performing definitive surgery thorough peritoneal lavage was done with at least 4-6 litres of sterile saline and drains

were inserted in required spaces. In first group, the abdomen was closed en masses or with tension suturing; where as in second group, a strip of sterile polypropylene (Marlex mesh) of wound size was anchored with either rectus sheath or skin with Prolene- 00 as interrupted sutures circumferentially and wound was dressed. In this second group no drains were placed in the peritoneal cavity. After 24 hours a pre-sterile zipper was sutured in the middle of mesh after dividing it in the middle. This zip could be unzipped to inspect the peritoneal cavity and for debridement of necrotic materials, for irrigation of abdominal cavity. As the sign of sepsis abated, the zipper and mesh were removed and the abdomen was closed either en masse or putting tension sutures under general anaesthesia. Post operatively we analyzed the incidence of wound dehiscence, burst abdomen, and death. This study was conducted with the aim to establish whether zipper mesh technique has any

advantages over conventional closure en mass or not, so that a protocol of its management could be devised to minimize the morbidity and mortality.

OBSERVATION

There was a male predominance in both groups with mean age of 33 years in zipper-mesh group as opposed to 36 years in conventional closure group (table-1). In mesh laparostomy and zipper group, 50% had undergone single surgery, 28.57% had two surgeries, whereas 14.28% had three surgeries and 7.14% had four surgeries. This figure was 64.28% for single surgery, 28.57% had two and 7.14% had three surgeries in conventional group (table-2). Total ten surgeries were performed through the zip, single surgery in 5 patients, twice in one and thrice in one patient.



In conventional group, 7(50%) patients had residual abscesses, which was detected either by ultrasonography or on re-exploration of abdomen. Out of seven patients, 4 had single, 3 had two pocket of collections. The 5 patients were operated and 1 patient was kept on conservative line of management, while one patient died on the day of diagnosis (Table-3).

laparostomy group were high (n=6) as compared to conventional group (n=4), although the rate of burst abdomen and basal atelectasis incidence were higher in conventional group (table-4). One patient in mesh laparostomy group developed DVT, who died later on due to pulmonary embolism.

Table 3. Comparison of Residual Abscesses In Conventional Group

Number of Residual Abscess	Total Patients	Operated	Conservative
0	7	0	7
1	4	3	1
2	3	2	1
3	0	0	0

Table 4.

Complications	Mesh Laparostomy & Zipper Group	Conventional Group
Intestinal Leak	6	4
Burst Abdomen	2	5
Residual Abscesses	0	7
Skin Dehiscence	4	4
Deep Vein Thrombosis	1	0
Basal Atelectasis	5	7

In mesh laparostomy and zipper group, as all patients had frequent intra-peritoneal lavages, the incidence of collection was nil. The average hospital stay in mesh laparostomy group was 34 days, as compared to 30 days in conventional group. The incidence of intestinal leak complications in mesh

The mortality observed in case of mesh laparostomy group was 35.71% as opposed to 50% in conventional group. The majority of the expired patients were with APACHE score more than 20 Table-5. The cause of death in majority of the patients in both groups was multiple organ failure, except one

patient of mesh laparostomy patient, who died due to deep vein thrombosis and pulmonary embolism.

Table 5. Showing comparison of mortality in relation to APACHE II score

Patient Number	APACHE II Score	Mesh laparostomy Gr.	Conventional Gr.
1	22	A	D
2	27	D	D
3	14	A	A
4	14	A	A
5	25	D	D
6	12	A	A
7	16	A	A
8	22	A	D
9	13	D	A
10	23	D	D
11	29	D	D
12	15	A	A
13	18	A	D
14	14	A	A

D=Dead, A-Alive

DISCUSSION:

Despite the advent of powerful parenteral antibiotics, technologically advanced surgical intensive care units, the management of peritonitis is still individual and it depends on several factors like severity of disease, host factors, the amount and type of peritoneal contaminations. Recently, newer approach of temporary closure of abdomen with zipper, slide fasteners and Velcro analogues have tried to facilitate daily exploration, drainage and cleaning of peritoneal cavity. Selection of patients for proper application of the technique is an important factor. Hedderich et al⁹ had given more emphasis on extent and severity of intra-abdominal infection as well as age and status of patient, whereas Walsh et al¹⁰ and Garcia et al¹¹ had given more emphasis on the APACHE score. High APACHE II score indicate late presentation of the patients and also the advance stage of the disease process. The mean APACHE II score in this present study was 19 points excluding arterial blood gas analysis predicting a mortality of 42%. In case of zipper technique, daily lavage was possible, along with direct visual examination of the peritoneal cavity. Residual abscesses were easily detected during daily lavage through zipper. While in conventional group ultrasound abdomen was required for detection of intra-peritoneal collection and another re-exploration was required to drain the collection. Walsh reported the formation of adhesions even when the abdomen was being lavaged thrice daily. In contrast we have found only filmy adhesions, which were fragile and

broken without significant bleeding. These findings were also encountered by Singh et al¹². We had not used drain in mesh laparostomy and zipper technique group. Some authors recommended & reported that these were helpful in removing irrigation fluid during and after lavage(?), but Walsh and Chiasson¹⁰ considered the use of drains as redundant.

The average closure of abdominal wall in our study was 8th day; Teichmann et al¹³ closed the wound on an average of 12th day. The primary closure of wound was preferred in 79% of cases by Teichmann et al, Whereas Walsh et al allowed the wounds to close by secondary intention. We performed closure in 9 patients in mesh laparostomy with zipper group; out of these 9 patients 5 under went for tension suturing and 4 patients for mass closure. In mass closure 2 developed wound dehiscence and 2 burst abdomen, which was treated by subsequent secondary suturing. The mass closure was performed in 12 patients in conventional group, out of which 6 died postoperatively. Out of 6 alive patient of mass closure, 5 developed burst abdomen and 1 skin dehiscence. The skin dehiscence was treated by delayed suturing after the clearance of infection. Burst abdomen after definitive closure was more in conventional group might be due to abdominal tension present during closure. Basal atelectasis was more in conventional group. We did not encountered spontaneous or traumatic fistulization due to mesh or zipper, used in our study. The patients with mesh laparostomy & zipper technique were kept on both hyper- alimentation or Ryle’s tube feeding or jejunostomy feeding as in conventional treatment, because lavages did not precipitate or unduly prolong the paralytic ileus. In mesh laparostomy & zipper group, patients can be made ambulatory postoperatively earlier as compared to conventional group. The outcome of patients in whom the initial standard surgery associated with first attempt mesh and zipper insertion was better than the patient in whom mesh was used in subsequent surgeries.

CONCLUSION

The mesh was applied to those patients who had gross sepsis, compromised anastomosis, high APACHE II scores or tension at closure. These patients were compared with conventional group where abdomen was closed after exploration, definitive surgery and peritoneal lavage. Comparison was done in patients with same APACHE II scores in both groups. The results were same with conventional and mesh laparostomy group with low APACHE II scores, whereas with high APACHE II scores the result of mesh laparostomy has an edge over the conventional group. Intra-abdominal residual abscesses and secondary pathology could be easily detected on daily

exploration during lavage in mesh laparostomy group, while in conventional group 35.71% patients underwent re-exploration for residual abscesses and secondary pathology, which was detected after a significant time lapse. The mean hospital stay was almost equal in both groups, 34 days in mesh laparostomy as oppose to 30 days in conventional group. We found better survival outcome in mesh laparostomy group. The mortality was 50% in conventional group, whereas it was as low as 35.71% in mesh laparostomy group.

Since the mesh laparostomy allowed effective continuing drainage of the septic abdomen, better prognosis and almost equal hospital stay; the mesh laparostomy group had some edge over the conventional group. Although this is a very small study to propagate mesh laparostomy as an ideal procedure for abdominal wall closure in case of acute bacterial peritonitis, but there is some scope for its further trials and other re-modalisation of this technique.

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Nail the Culprit: Dental Identification

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ABSTRACT

Forensic dentistry plays a major role in identification of deceased individuals⁹. Dental identification of humans occurs for a number of different reasons and in a number of different situations¹⁵. The bodies of victims of violent crimes,^{16,13} fires,³ motor vehicle accidents⁷ and work place accidents can be disfigured to such an extent that identification by a family member is neither reliable nor desirable¹⁰. Persons who have been deceased for some time prior to discovery and those found in water also present unpleasant and difficult visual identifications. Dental identifications have always played a key role in natural and manmade disaster situations and in particular the mass casualties normally associated with aviation disasters^{4,1,5,6}. Because of the lack of a comprehensive fingerprint database, dental identification continues to be crucial.

Key words: Human identification, Dental identification, Bite marks, DNA profiling, Comparative Identification, postmortem profiling.

INTRODUCTION

As we enter a new millennium, society is faced with fresh challenges in every conceivable area. Despite leaps in modern technology, medical breakthroughs and the geographical changes that the last century has brought, crime still persists in all aspects of our lives. Violent and heinous activities that shatter the lives of victims, their friends and families occur everyday. Often, little can be done to repair such damage. The apprehension and subsequent prosecution of the perpetrator(s) is essential to maintain law and order. Through the specialty of forensic odontology, dentistry plays a small but significant role in this process. By identifying the victims of crime and disaster through dental records, dentists assist those involved in crime investigation. Always part of a bigger team, such personnel are dedicated to the common principles of all those involved in forensic casework: the rights of the dead and those who survive them¹².

The most common role of the forensic dentist is the identification of deceased individuals⁹. Dental identification takes two main forms. Firstly, the most frequently performed examination is a comparative

identification that is used to establish to a high degree of certainty that the remains of a decedent and a person represented by antemortem (before death) records are the same individual. Information from the body or circumstances usually contains clues as to who has died. Secondly, in those cases where antemortem records are not available, and no clues to the possible identity exist, a postmortem (after death) dental profile is completed by the forensic dentist suggesting characteristics of the individual likely to narrow the search for the antemortem materials¹⁴.

Role of DNA in dental identifications

With the introduction of polymerase chain reaction, (PCR) a technique that allows amplification of DNA at pre-selected, specific sites, this source of evidence is now increasingly popular. Comparison of DNA preserved in, and extracted from the teeth of an unidentified individual can be made to a known antemortem sample (stored blood, hairbrush, clothing, cervical smear, biopsy etc) or to a parent or sibling¹⁴.

Genomic DNA

Genomic DNA is found in the nucleus of each cell and represents the DNA source for most forensic applications, (there are no nuclei, and hence there is no DNA, in red blood cells.) When body tissues have decomposed, the structures of the enamel, dentine and pulp complex persist. It is necessary to extract the DNA from the calcified tissues. Teeth represent an excellent source of genomic DNA. PCR-based analysis produces

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a DNA profile that can be compared with known antemortem samples or paternal DNA. The identification of individuals is not the only use for dental DNA. The technique has allowed criminal investigators to link victims to crime scenes once the body has been removed and incinerated¹².

Mitochondrial DNA

In addition to genomic DNA, cells contain mitochondrial DNA (mtDNA), the sequence of building blocks of which can be determined to assist in identification. The main advantage of mtDNA is that there is a high copy number in each cell caused by the high number of mitochondria present in most cells. This infers that in cases where genomic DNA cannot be analyzed, possibly because it is too degraded, mtDNA may be present in sufficient quantity. In addition to its higher copy number, mtDNA is maternally inherited.

This maternal inheritance pattern confers the same mtDNA sequence, barring mutations, upon siblings and all their maternal relatives. This has important implications for the identification of individuals for which there is no antemortem comparison sample. Although mitochondrial DNA is still in its infancy in forensic casework, it is a powerful technique that is likely to become commonplace in the future¹².

Comparative dental identification

The puzzle that surrounds dental identification is that postmortem dental remains can be compared with antemortem dental records, including written notes, study casts, radiographs etc to confirm identity. Individuals with numerous and complex dental treatments are often easier to identify than those individuals with little or no restorative treatment. The teeth are a reservoir for such unique features and can survive most postmortem events that can change other body tissues¹³.

Human remains are found and reported to the police and they then initiate a request for dental identification. A tentative identification like a wallet or driving license is sometimes found which enables the antemortem records to be located. Sometimes the geographical location in which the body is found enables an identification to be made using data from the missing persons database. Antemortem records are then obtained from the dentist of record⁸.

The forensic dentist produces the postmortem record by careful charting and written descriptions of the dental structures and radiographs. If the antemortem records are available at this time, a postmortem radiograph should be taken to replicate the type and angle of these. Radiographs should be marked with a rubber-dam punch to indicate antemortem and postmortem to prevent confusion-one

hole for antemortem films and two holes for postmortem films. Once the postmortem record is complete, a comparison between the two records is carried out. A methodical and systematic comparison is required, examining each tooth and surrounding structures in turn. While dental restorations are important in the identification process, many other oral features are assessed. Such additional features play an increasingly important role in those individuals with minimal restorations. Because of the decrease in dental caries, non-restorative cases are on the rise¹¹.

Postmortem dental profiling

When antemortem dental records are not available and other methods of identification are not possible then postmortem dental profiling is done. This is done by limiting the population pool to which the deceased individual is likely to belong and thus increase the likelihood of locating antemortem records. It provides information on the age of the deceased, his ancestral background, sex and socio-economic status. Sometimes information can also be obtained on the occupation, dietary habits, habitual behaviour and dental and systemic diseases¹⁴.

Forensic anthropologists most often provide details of osteological studies, but forensic dentists can assist in the process. The determination of sex and ancestry can be assessed from skull shape and form. Generally, from skull appearance, forensic dentists can determine race within the three major groups: Caucasoid, Mongoloid and Negroid. Additional characteristics, such as cusps of Carabelli, shovel-shaped incisors and multi-cusped premolars, can also assist in determination of ancestry. Sex determination is usually based on cranial appearance, as no sex differences are apparent in the morphology of teeth. Microscopic examination of teeth can confirm sex by the presence or absence of Y-chromatin and DNA analysis can also reveal sex¹².

Other methods of dental identification

The two processes described above, comparative identification and post-mortem profiling, represent the most common methods of dental identification. However, in some instances more novel and innovative techniques have been applied. There have been a number of requests from individuals and dental organizations over the years to insist that dental prostheses are labelled with the patient's name or a unique number. Unlabelled dentures have been recovered from patients and then fitted to casts retained by the treating dentist or laboratory, and this has been an accepted method of identification. Other dental appliances, such as removable orthodontic braces have also been used for identification purposes. Whittaker describes a case where a removable orthodontic appliance was used to identify a victim of a house fire¹².

Dental Identification in mass disaster

The identification of large numbers of casualties in mass disasters are complex and fraught with hazards, both physically and emotionally. The identification process is fundamentally the same as that in a routine comparative dental identification, but the inherent problems are magnified. Problems of body fragmentation, mutilation, commingling and incineration, idiosyncratic dental records from numerous regions, poor working conditions and psychological stresses all confound the identification process. The key to successful mass disaster identification is preparedness. Many jurisdictions have dental identification teams and disaster plans in place. Mock disaster scenarios that help dentists prepare for the disaster situation have proven to be successful¹².

Reporting a Dental Identification

The American Board of Forensic Odontology recommends that reporting a dental identification is limited to the following four conclusions:

- Positive identification- The antemortem and postmortem data match in sufficient detail, with no unexplainable discrepancies, to establish that they are from the same individual.
- Possible identification- The antemortem and postmortem data have consistent features but, because of the quality of either the postmortem remains or the antemortem evidence, it is not possible to establish identity positively.
- Insufficient evidence- The available information is insufficient to form a basis of conclusion.
- Exclusion- The antemortem and postmortem data are clearly inconsistent².

CONCLUSION

Although we are a civilized and cultured society, we still see deaths due to suicides, homicides and accidents. Natural disasters such as floods, cyclones earthquakes and other activities such as air and rail disasters, fires, industrial accidents and terrorism also wreck havoc in society.

Identification of the criminal and the victim is of paramount importance from a social, emotional and legal view-point. The most reliable means of identification include: fingerprints, dental comparisons and biological methods such as DNA profiling. Although forensic medicine is by and large involved in this, identification by dental records is also possible.

Forensic odontology is one of the most unexplored and intriguing branch of forensic medicine. Dental evidence plays a vital role in establishing the identity

of the dead. In this process dental records that can be used are tooth, arch shape, saliva, bitemarks and pulp tissue from which personal identification can be made accurately.

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Ulcer Foot - Malignant Melanoma - A Case Report

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ABSTRACT

Malignant melanoma is fatal skin cancer when detected and treated early prognosis will be good. Recent reports indicate rising incidence globally. This case study indicates how the people neglect the problems so much. A female patient aged 65 years presented with a painful non healing ulcer with pigmented margins of eighteen months duration on plantar aspect of the right heel. Three lymph nodes were present in the right inguinal region aspirated and obtained tarry coloured fluid revealed malignant melanoma cells with melanin pigment. Biopsy report confirmed the diagnosis that nodular aggregates of infiltrating melanoma cells with melanin pigment in the background of necrosis. Malignant melanoma remains one of the most challenging malignant neoplasm, particularly in developing countries where majority of patients present with late stage disease. Size of the ulcer indicates negligence of the patient. Health education may lead to future decline in morbidity and mortality.

Key words: : Ulcer foot, Pigmented margins, Malignant melanoma.

INTRODUCTION

Melanoma is most dangerous type of skin cancer arising from melanocytes which produce a skin pigment called melanin. Melanin is responsible for colour of hair and skin. Melanocytes predominantly present in skin and also in bowel & eye. Melanoma is one of the less common types of skin cancer but causes majority of skin cancer deaths. Melanoma can appear on normal skin or may arise from a birth mole. It is also called malignant melanoma because it spreads to other areas of the body as it grows beneath the surface of the skin. The development of melanoma related to long term exposure of strong sun light or ultra violet radiation particularly in fair skinned people.

There are 4 types of melanoma

A. **Superficial spreading melanoma:** is most common type, 70% of melanomas. Usually flat irregular in shape and colour, with different shades of black and brown. It may occur at any

age and body site and most common in caucasians.

- B. **Nodular melanoma:** constitutes 15% of melanomas usually starts as a raised area with bluish blue or bluish red or may be amelanotic.
- C. **Lentigo maligna melanoma:** Constitute 10% of melanomas and usually occurs in the elderly. Commonly seen in sun damaged skin of face, neck & arms. Usually large flat and tan in colour.
- D. **Acral lentiginous melanoma:** least common form of melanoma 5%. Common in African Americans and occurs on the palms & soles.

Rarely melanomas may appear in mouth, iris of the eye or retina. It may be noticed at the time of dental or eye examination. It can also develop in vagina oesophagus anus, urinary tract & small intestine.

Primary symptoms are mole, sore, lump or growth on the skin.

ABCD system for easy remembering of symptoms

- A. Asymmetry - in the affected area.
- B. Borders - irregular edges.
- C. Colour changes - shades of tan, brown or black.
- D. Diameter - usually larger than 6 mm.

Biopsy may confirm the diagnosis. Prognosis depends on the early diagnosis and treatment⁶.

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CASE REPORT

A 65 years old female presented with painful ulcer over the plantar aspect of the right heel for 18 months duration of size 7.5 x 5cms. Slowly growing ulcer with pigmented margins Figure 1. Not a known diabetic. No history of pre existing naevus or ulcer. Patient complaining of loss of appetite, loss of weight and swelling in the inguinal region. Three lymph nodes

found were aspirated and obtained blakish tarry coloured fluid which shows melanoma cells with melanin pigment suggestive of malignant melanoma Figure 2. An incisional biopsy was taken from the foot lesion confirmed the diagnosis, that nodular aggregates of infiltrating melanoma cells with melanin pigment in the background of necrosis Figure 3 & 4. Immunohistochemical stains S 100 & HMB-45 not done as it is well differentiated malignant melanoma¹. CT scan revealed no metastasis of chest and abdomen. As per TNM staging it was labeled Stage III C. No similar history in the family members.



Fig.1: Ulcer heel with pigmented margins.

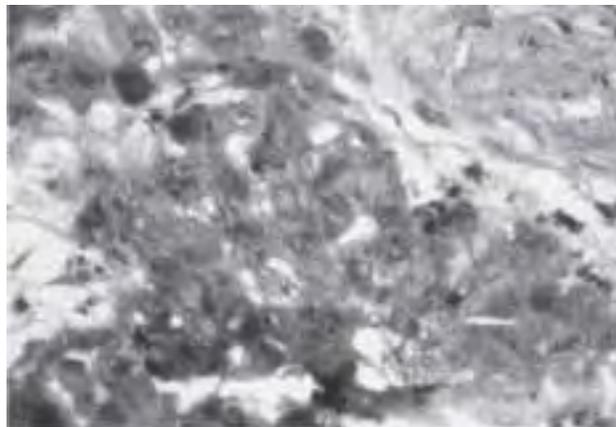


Fig.3: Melanoma cells with melanin pigment [H&EX800].

DISCUSSION

Worldwide incidence of melanoma is increasing at a faster rate than any other neoplasm. Around 60 thousand new cases of invassive malignant melanoma are diagnosed in U.S each year. As per WHO 48 thousand melanoma related deaths registered worldwide per year that is approximately 1% of all cancer deaths. Queensland, Australia & Israel has highest incidence of melanoma in the world⁴. Increased incidence of uveal melanoma is seen in France, Italy and Japan. It is interesting that when Jews residing in various parts of the world were studied those in Asia & Africa had the lowest incidence. India is one of the low incidence regions of the world. Indian ethnic migrants to Great Britain also enjoy low mortality in relation to melanoma¹.

Melanoma may occur at any age. The risk of developing melanoma increases with age, highest among those in their eighties. It is one of the more common cancers in young adults and otherwise healthy people. People who begin using tanning devices [U V radiation] before 30 years of age are 75% more likely to develop melanoma. The rarity of the tumour before puberty indicates hormonal influence². Melanoma more common in whites than blacks and Asians. It is the 5th most common malignancy in men and 6th most common in women. Approximately 10%



Fig.2: Melanoma cell in FNAC [H&E X800].



Fig.3: Nodular aggregates of melanoma cells in the background of necrosis & melanin pigment [H&E x400].

of all patients with melanoma have a family history⁴. Familial melanoma is genetically heterogeneous. Loci for familial melanoma have been identified on the chromosome arms 1p, 9p&12q. Multiple genetic events have been related to the pathogenesis of melanoma. Mutation of the MD M2 SNP 309 gene is associated with increased risk of melanoma in younger women. Mutations that cause the skin condition Xeroderma Pigmentosum also seriously predispose one to melanoma⁵.

Acral lentiginous melanoma, first described by Rene, is the most common melanoma type that presents on the plantar aspect of the foot and is frequently misdiagnosed due to its less common location and because it does not fit the 'changing mole' pattern. This type is commonly amelanotic. Plantar melanomas are more commonly ulcerated than melanomas on the leg. Ulcerated and amelanotic melanomas still present a considerable clinical challenge. Aggressive tumors grow quickly and can ulcerate early. It does not exhibit the classic signs of malignant melanoma associated with the mnemonic acid³. The Bombay cancer group found sole of foot and internal mucous membranes as major anatomic sites in Indians. Plantar acral melanomas constituted ¼ of all melanomas in a study from Manipal. In Hong Kong & China cutaneous malignant melanoma is found predominantly at an older age with the acral lentiginous type, located mainly on the feet¹. Its thickness at the time of diagnosis is crucial to the prognosis but there is no significant difference between the mean thickness of melanomas on plantar surface. Ulceration is equivalent to having a thicker, more advanced tumour. Past history of melanoma must be elicited as there is increased risk of second melanoma⁴. Melanoma is one of the most notorious tumors both for metastasis at unusual locations or after a long latent period¹. Brain is a common site of metastasis associated with poor prognosis⁴. Incidence of inguinal lymph node metastasis reported in 4% of cases without primary lesion may be due to spontaneous regression of primary lesion².

Although Immunohistochemical stains usually are not necessary for diagnosis, they are generally performed for completeness. S-100& HMB 45 stains are positive in melanoma. S-100 is highly sensitive, but not specific for melanoma. HMB 45 is highly specific but moderately sensitive for melanoma. These stains are useful for poorly differentiated melanomas.

Acral melanoma has been mistaken for plantar warts, fungal infections, hyperkeratotic lesions and non-healing ulcers. Non healing diabetic foot ulcers should be biopsied to rule out melanoma. A black malignant melanoma can also be mistaken for gangrene. Squamous cell carcinoma ulceration is extremely rare on skin, which was not previously damaged by radiation, burns or chronic inflammation.

Early detection of malignant melanoma greatly enhances the prognosis which depends on age, sex, site, mitotic divisions & ulceration. Younger patients have better prognosis & Male have worse. Primary melanoma of the foot has been associated with a poorer survival rate than secondary type. Head & neck melanomas have worse prognosis than limbs⁵.

Melanoma that occurs in the foot or ankle often goes unnoticed during its earliest stage, when it would be more easily treated. By the time melanoma of the foot or ankle is diagnosed, it frequently has progressed to an advanced stage, accounting for a higher mortality rate. The existence of malignant melanoma though uncommon in our country, needs to be recognized and considered in the diagnosis of poorly differentiated lesions at any site.

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A Study of Incidence of Fulminant Hepatic Failure in Paediatric Age Group and Knowledge, Behaviour & Attitude Regarding Etiology of Jaundice in Society

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ABSTRACT

Object: To study the incidence and etiology of fulminant hepatic failure (FHF) in children and to study, attitude, behavior and knowledge regarding etiology and treatment of jaundice among the accompanying persons of cases of Jaundice.

Material & methods: The present study was conducted in the Department of Pediatrics, Saraswathi Institute of Medical Sciences (SIMS), Anwarpur, Hapur. 38570 children between 6 months to 18 years of age belonging to both rural and urban areas with signs and symptoms suggestive of liver disease and Children who fulfilled diagnostic criteria of FHF were included. Children were investigated for incidence and etiology of liver disease. A questionnaire was prepared to study the knowledge, attitude and behavior regarding etiology and treatment of jaundice among the accompanying persons of Jaundice Patients.

Result: Incidence of FHF was 1.4 per 1000 per year. Out of total 1010 jaundiced patients, incidence of FHF was 2.5%. Cases of FHF were maximum 61.1% in 5-15 year age group, Male: female ratio was almost equal in case of FHF (1.25:1). In our study etiological diagnosis was possible in 68.48% cases, out of which 61.08% were of viral etiology. 31.48% were idiopathic. Drug induced FHF was in 7.4%. Out of 1010 Jaundice patients, 370 patients (36.63%) were from urban area and 640 patients (63.36%) were from rural area. Commonest misconception was that the cause of hepatitis is super natural and they go to supernatural healers (Quacks) for treatment, 50% from urban area and 78.12% from rural area had this belief. They follow a special diet, they restrict protein, fat, Yellow Edible things like turmeric and not use full milk, in urban area 70.54% and In Rural area 84.37% had this belief. Knowledge and Awareness about immunisation, safe Injection and safe water was observed in accompanying persons of rural and urban area. it was found that there is less awareness in rural area then urban area. it was observed that there is significant co-relation between knowledge, attitude and behavior of public on the occurrence and complication of jaundice.

Conclusion: It is concluded that there is need to increase the public awareness by different educational programs regarding etiology of hepatitis and its prevention by immunisation for hepatitis A and B, use of safe injection, safe water and hygienic Sanitary habits. Early detection of liver disease and management of case by a competent doctor is the mainstay to decrease the mortality from jaundice.

Type of Study: Prospective hospital based mortality.

Keywords: : Jaundice, FHF, Hepatitis, immunization,

INTRODUCTION

FHF is usually defined as the severe impairment of hepatic functions in the absence of pre-existing liver disease. FHF is a clinical syndrome resulting from massive necrosis of hepatocytes or from severe functional impairment of hepatocytes. The currently accepted definition in children includes¹.

- (1) Biochemical evidence of acute liver injury (usually <8 week duration)
- (2) No evidence of chronic liver disease and Hepatic based coagulopathy defined as a prothrombin time (PT) > 15 seconds or international normalized ratio (INR) > 1.5 not corrected by vitamin K, in the presence of clinical features of hepatic encephalopathy or PT > 20 seconds or INR > 2

regardless of the presence or absence of clinical features of hepatic encephalopathy

CAUSES OF FHF

Infectious agents: In approximately 50% of patients, FHF is caused by acute viral hepatitis, common hepatotropic viruses are A, B, C, D, & E. Many non hepatotropic viruses other than hepatitis are also recognized as cause of FHF in childhood, including Epstein Barr virus, cytomegalovirus (CMV); paramyxovirus, varicella zoster virus, herpes virus types 1, 2 and 6; parvovirus and adenovirus.

Hepatotoxic drugs: These agents are the second most common causes of FHF, responsible for approximately 25% of cases, eg. Acetaminophen overdose, sodium Valproate etc.

Circulatory causes: Is uncommon cause of FHF. They include congestive heart failure, cardiomyopathy, sepsis, shock, cyanotic heart disease.

Other **causes** include Hodgkin's disease, leukemic infiltration, and autoimmune hepatitis.

Idiopathic: Idiopathic FHF remains significant in children.

MATERIAL & METHODS: The present study was conducted in the Department of Pediatrics, SIMS Anwarpur Hapur for a period of 24 months from January 2010 to Dec. 2011. Random sampling was done and cases are selected from indoor and OPD, Department of Pediatric SIMS (Tertiary Level Care Center) Anwarpur Hapur. The study was conducted in collaboration with Departments of Pathology and Biochemistry.

Inclusion Criteria: The cases were selected randomly from OPD and ward; they comprised children between 6 months to 18 years of age belonging to both rural and urban areas and of various religions and socio-economic status, Children with signs and symptoms suggestive of liver disease and Children who fulfilled diagnostic criteria of FHF.

Exclusion Criteria: Children with pre existing liver disease were excluded.

A detailed case history was taken and a thorough clinical examination was done in each case. The findings were recorded in a specially prepared Performa.

The cases were subjected to following investigation: HB, TLC, DLC, ESR, Hepatic Enzymes- SGPT, SGOT, Serum Alkaline Phosphatase, S. Bilirubin- Direct & Indirect, RBS, Renal Function - S. Creatinine, S. Phosphorous, Serum Electrolytes - S. Na⁺, S. K⁺,

S. Ca⁺⁺, Coagulation Profile - PT, APTT, Viral Studies- HBs Ag, IgM anti HBcAg, Anti HAV IgM, Anti HCV antibody, Anti HEV IgM IgG or IgM antibody against CMV, EBV and Herpes virus, Toxin and drug level in serum whenever indicated. A questionnaire was prepared to study the knowledge, attitude and behavior regarding etiology and treatment of jaundice & FHF.

OBSERVATIONS

In this study following observations were made.

Out of sample size 38570, 54 Patients were diagnosed as FHF. Incidence rate calculated and it was found 1.4 per 1000 per year. (Table I). Out of total 1010 jaundiced patients, 40 patients were diagnosed as FHF. It was found that cases of FHF were maximum (61.1%) in 5-15 year age group (Table II). The table shows that male female ratio is almost equal in case of FHF (1.25:1) (Table III). In our study etiological diagnosis was possible in 68.48% cases, out of which 61.08% were of viral etiology. Idiopathic FHF remains a significant cause in children (31.48%). Drug induced FHF was in 7.4% Cases and all cases were due to Paracetamol drug injury (Table IV). Jaundice in Urban and Rural Area was 36.63% and 63.36% respectively (Table V). Regarding misconceptions among accompanying person, commonest misconception was that the cause of hepatitis is super natural and there is no need to go to Doctor, It was found 50% and 78.12% in Urban and Rural Areas Respectively. They go to super natural healers (Quacks) for treatment, who use Bhaboot and Necklace of Special Wood. Super natural healers also do Jharphook (Mantra Tantra) to treat this disease and they also use special herbs for treatment, 50% of Urban and 78.12% of rural accompanying person visited these so called healers before coming to hospital. About 70.54% from urban area and 84.37% from rural area think that they had to follow a special diet with restricted protein and Fat. They do not give Yellow Edible Things to eat like turmeric they also think that full milk should not be used. These thought misbeliefs lead to more malnourishment and increased risk of complications (Table VI). Knowledge and Awareness about immunisation safe Injection and Safe Water was observed, Immunisation against hepatitis A and hepatitis B is available but accompanying persons were not aware about Immunisation against these Viruses. Regarding awareness about immunization 50% and 30% accompanying persons were aware from Urban and Rural area respectively. Safe Injection and use of disposable syringes is must to prevent hepatitis B and hepatitis C. In urban area 74.86% and in rural area only 50% had knowledge of safe Injection. Use of safe water is must to reduce the faeco-oral transmission of hepatitis A and E. In Urban area 74.86% and in rural

area 39.06% had knowledge of safe water. (Table VII)

Table I. Incidence of FHF

Total Patients (OPD + IPD)	No. of fulminant hepatic failure Patients	incidence
38570	54	1.4 per 1000

Table II. Age Incidence of FHF

Age group	No. of patients	%
Below 5 year	12	22.22
5-10 year	15	27.77
11-15 year	18	33.33
16-18 year	9	16.66
Total	54	100

Table III. Gender Incidence of FHF

Sex	No. of patients	%
Male	30	55.5
Female	24	44.44
Total	54	100%

Table IV. Etiology of FHF

Etiology	No. of Patients	0/o
Hepatitis A	18	33.33
Hepatitis B	5	9.25
Hepatitis C	2	3.70
Hepatitis E	8	14.8
Drugs	4	7.40
Idiopathic	17	31.48
Total	54	100%

Table V. Demographic Pattern of Jaundice Patients

N=1010 Jaundice Patients

AREA	No of Patient of Jaundice	%
URBAN	370	36.63
RURAL	640	63.36

TABLE VI. Misconceptions regarding Jaundice in Rural and Urban Area

Misconception	Urban/ Rural	No of Patients	%
Disease is Super Natural	Urban	185	50%
	Rural	500	78.12%
Goes to Quacks for treatment	Urban	185	50%
	Rural	500	78.12%
Dietary Restriction	Urban	261	70.54%
	Rural	540	84.37%

TABLE VII. Knowledge and Awareness about immunization safe Injection and Safe Water

Have Knowledge of	Urban/ Rural	No of Patients	%
Immunisation of hepatitis A and B	Urban	185	50%
	Rural	192	30%
Safe Injection	Urban	277	74.86%
	Rural	320	50%
Taking Safe Water	Urban	277	74.86%
	Rural	250	39.06%

DISCUSSION

The Incidence of FHF was 1.4 per 1000 per year. In the present study most of the patients [58.5%] were in 5-15 year age group. Bradley et al (1983)² reported that disease affects the young adults predominantly. In the present study male: Female ratio was 1.25:1 i.e. males and Females were almost equally affected. Results were comparable with Raju et al (1989)³, Gimson et al (1983)⁴, U poddar et al (2002)⁵. In the present study viral etiology was present in 61.08%, out of which hepatitis A found in about 33.33%. HEV 14.8% and Hepatitis B in 9.25% cases. Similar observation was noted by MD Yohannan (1990)⁶, Thapa et al (1995)⁷, U Poddar et al (2002)⁵. Drug induced FHF was in 7.4% cases, whereas paracetamol overdoses was prominent cause of FHF in Europe (42%) Gagan K Sood, Julian Katz (2011)⁸. No cause was found in 31.48% cases, the observation for idiopathic FHF was similar to Robert H et al (2008)⁹, various misconceptions and lack of knowledge were present in both rural and urban areas but they were more prevalent in rural areas. Misconception like cause of hepatitis is super natural and can be treated by super natural healers was more in rural area (72.12%) then urban area (50%). Misconception regarding restriction of diet in jaundice was more in rural area (88.2 %) then urban area (50 %). Dietary restriction was more in rural area (84.37%) than urban area (70.54%). Knowledge of immunization for hepatitis A and hepatitis B was more in urban area (50%) then rural area (30%) Knowledge of safe injection was present more in urban area (74.86%) then in rural area (39.06%) Use of safe water and safe sanitary practices was more in urban area (74.86%) then rural area (39.06%).

CONCLUSION

On the basis of this study following conclusion were drawn:- FHF has a low incidence. In our study incidence rate was 1.4 per 1000 per year. Incidence of FHF in jaundice patient was 2.5 %, in this study 61.1% patients were of 5-15 year of age group. Our result showed that there is significant co-relation between knowledge, attitude and behavior on the occurrence

of Jaundice and its complications this calls for increasing awareness on all aspects of jaundice to minimize the complications. It is concluded that there is need to increase the public awareness by different educational programs regarding etiology of hepatitis and its prevention by immunisation for hepatitis A and B, use of safe injection, safe water and hygienic Sanitary habits. Early detection of liver disease and management of case by a competent doctor is the mainstay to decrease the mortality from Jaundice.

KEY MESSAGE

- One of the most common causes of FHF is viral, so immunisation against hepatitis A & B must be introduced in immunization programme.

Education programmes regarding safe injection, etiology of hepatitis, immunization, personal and environmental hygiene must be introduced in schools.

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Sero-Prevalence of Rubella infection

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ABSTRACT

Background: The burden of rubella infection in most of the developing countries especially in Africa is not well documented because of limited epidemiological studies. Congenital rubella syndrome (CRS) in the newborn is one of the important complications of rubella infection. Many countries have introduced MMR (measles, mumps and rubella) vaccine to control CRS. Measles has been successfully controlled in many countries by vaccination centered measles control program. However, most of the African countries have not included MMR vaccine in their national immunization program.

Objective: The exact magnitude of Rubella cases in this geographic area is not known. The availability of an effective vaccine to prevent Rubella infection and therefore CRS, has made it necessary to evaluate the burden of disease in a country where MMR vaccine is not covered in the immunization schedule or in vaccination strategy. A retrospective study was undertaken to find out the seroprevalence of rubella infection in Eritrea.

Material and Methods: This study was done in the Immunoserology section of National Health Laboratory of Eritrea which is also National Reference Laboratory. The results of earlier years were collected from the National Measles reference Laboratory and this data is primary and reliable. Rubella specific IgM kit was used using Dade-Behring, Germany ELISA kit. Specimen collection, handling, transport and processing were done as per the instructions given by the manufacturer.

Results: The seroprevalence of rubella cases (69) were high in the year 2006, when compared to other years. Like in most of the studies, the distribution of Rubella cases was maximum in children of below 14 years. Seasonal distribution of the rubella cases shows, 96% were recorded in January to May 2006 with highest number occurring in the month of April.

Conclusion: The results analysis indicate the prevalence of Rubella virus in this geographic area and in the absence of MMR vaccine in the immunization schedule there is every possibility of acquiring Rubella infection during pregnancy and therefore CRS.

Key words: *Rubella, Seroprevalence, Congenital rubella syndrome*

INTRODUCTION

In viral disease control measures, killer diseases of children that are preventable by vaccination are given top priority. These include diseases like Polio, Hepatitis, Measles, and Rubella. Rubella has a worldwide distribution. Before the introduction of vaccination, outbreaks tend to occur in spring and summer. Children of 3-10 yrs are most frequently

affected. Rubella is generally mild childhood viral disease. The disease is of very important public health problem because infection acquired during early pregnancy often results in number of fetal malformations called as Congenital Rubella Syndrome (CRS). Despite the vaccination program 5-10% of women of child bearing age are susceptible to rubella infection. Many nations have not introduced MMR vaccination and as a result, protection against Rubella is not provided to children. Thus making children vulnerable for Rubella infection¹. Congenital rubella is a major global cause of preventable hearing impairment, blindness and intellectual disability. The incidence rate of CRS is estimated to be 0.5 to 2.2 per

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1000 live births in developing countries. Only 28% of developing countries vaccinate against Rubella². In countries where vaccination is uncommon, the incidence of rubella infection is high and epidemics are frequent. Serology is the mainstay of diagnosis of rubella infection. A reliable method of diagnosing rubella infection in a laboratory is by detection of rubella-specific IgM antibodies.

Rubella has been a special concern of ophthalmologists for more than 60 years. In 1941, Greg reported cataracts in 78 infants, many of whom were also affected by congenital heart disease and failure to thrive. Subsequent studies confirmed that the risk of rubella defects was high in infants whose mothers were infected by rubella virus in the first 16 weeks of pregnancy³. WHO estimates that, worldwide, more than 100000 children are born with CRS each year, most of them in developing countries⁴.

Eritrea is situated in the horn of Africa with an area of 122,000 sq.kms, with a population of ~3.5 million. To the east, the country is bordered by the Red Sea, Djibouti borders in the South-East, Ethiopia in the South, the Sudan in the North & West. As per demographic & Health Survey, 2002, published by the National Statistics and Evaluation Office, Asmara, Eritrea, May 2003, the infant mortality rate is 48 and 93 per thousand live births.

Like any part of the world, Rubella cases are reported in Eritrea. In Integrated Disease Surveillance and Response Program, which was adopted in 1998 and implemented in 2001, Measles is one of the priority diseases. Rubella is not included in the priority diseases. A Measles Reference Laboratory, aided by WHO was established within National Reference Health Laboratory, in the year 2002. In Eritrea, Surveillance on the prevalence of Rubella by immunoserological studies, guides ministry of health in intervention measure. When referred to data available on measles and rubella, it appeared that measles cases are on down trend and rubella cases on up trend. The actual burden of rubella infection in most of the developing countries especially in Africa is not well documented. The availability of an effective vaccine to prevent Rubella infection and therefore CRS, has made it necessary to evaluate the burden of disease in a country where MMR vaccine is not covered in the immunization schedule or in vaccination strategy. This prompted us to take up this research study to find out the reality of rubella cases in Eritrea by taking immunoserological prevalence as a parameter.

MATERIAL AND METHODS

This study was done as part of senior research paper of second author in the Immunoserology section

of National Health Laboratory of Eritrea which is also National Reference Laboratory. The Measles Reference laboratory is located within National Health Laboratory and conducts tests for Measles and rubella suspected cases. The results of the other years were collected from the National Measles reference Laboratory and this data is primary and reliable. In brief, 5 ml of Blood specimen from each suspected patient was collected and serum was separated using biocentrifuge. Rubella specific IgM kit was used using Dade-Behring, Germany ELISA kit. Elisa test was done using standard protocol given by the manufacturer. Specimen collection, handling, transport and processing were done as per the instructions given by the manufacturer.

RESULTS

The number of suspected rubella cases ranged from 43 to 112 per year over the years 2002 to 2007 (Table 1 & Figure 1). The maximum number was in the year 2006. Of the 112 cases, 69 were laboratory confirmed rubella cases. However, trend was different in the year 2007, where the number of cases were 4. For the last 6 years, maximum of 69 cases were detected in 2006. These are confirmed cases of Rubella and usually referred to Measles Reference Laboratory for the detection of measles. Thus, clinical cases which were not referred to the reference center are likely to be high.

Table 1. Number of cases of Rubella - year wise

Year	Positive	Negative	Total
2002	18	37	55
2003	4	59	63
2004	1	33	34
2005	15	72	87
2006	69	43	112
2007	4	39	43
	111	283	394

In the year, 2006, a total of 127 suspected measles cases were investigated by immunoserology section and found 3 confirmed cases of measles by ELISA IgM

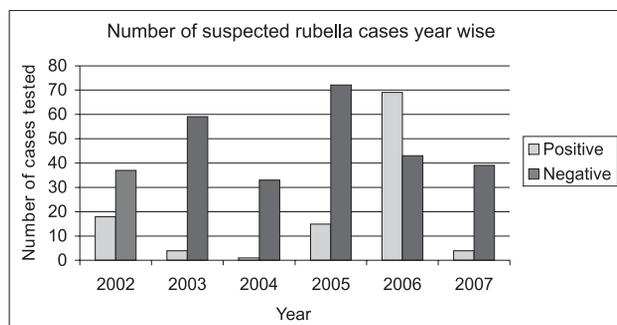


Fig. 1. Rubella cases - Year wise

specific for measles. On the other hand, of the 128 cases; 69 cases were confirmed by immunoserology laboratory as rubella. From the year 2006 data, it is evident that there is widespread presence of rubella in the community. 60 of the 65 cases were of below 14 years age group (Table 2 & Figure 2). Seasonal distribution of the rubella cases shows, 96% were recorded in January to May 2006 with highest number occurring in the month of April (Table 3 & Figure 3). The number of measles cases was 11,16, and 3 for the years 2004, 2005 and 2006, respectively.

Table 2. Rubella Cases – Age wise (Year 2006)

Age Group	Positive	Negative	Total
Less than 9 months	1	3	4
9 to <12 months	0	3	3
24 to < 60 months	10	7	17
5 to <14 years	49	21	70
14 years and above	5	3	8
Missing	4	6	10
Total	69	43	112

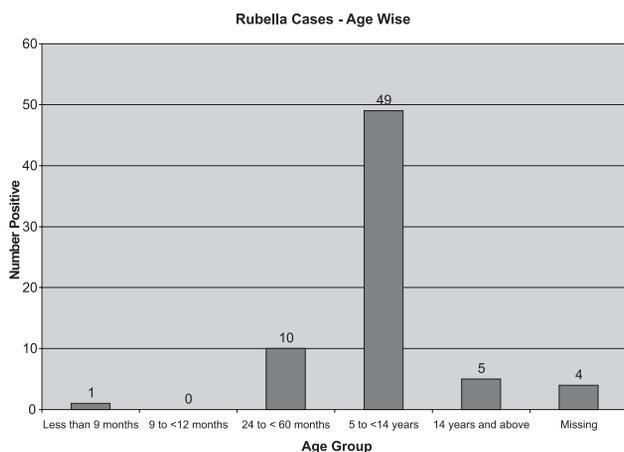
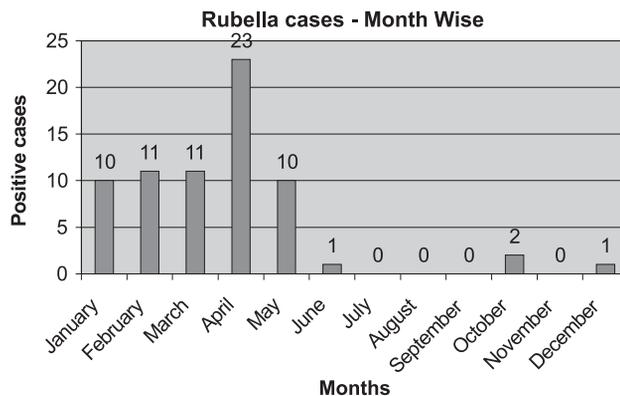


Table 3. Rubella cases - Month wise (Year 2006)

Month	Positive	Negative	Total
January	10	6	16
February	11	9	20
March	11	5	16
April	23	6	29
May	10	4	14
June	1	2	3
July	0	1	1
August	0	1	1
September	0	1	1
October	2	4	6
November	0	2	2
December	1	2	3
	69	43	112



DISCUSSION

Like in most of the studies^{4,5,6} the distribution of Rubella cases was maximum in children of below 14 years. Most of the cases recorded were in the months of January, February, March, April and May. It is difficult to draw any conclusion about seasonal distribution, just based on one year data. However, in many studies^{7,8} most of the rubella cases were recorded in winter. In the present study most of the cases were recorded in January to May period. In one of the studies involving screening 2300 cases for rubella infection, no seasonal pattern was observed⁹.

In a unvaccinated case low seroprevalences and late encounter of mumps and rubella was observed¹⁰. In another study, CMV infection was prevalent in a significantly higher number of children with hepatospleen-omegaly than rubella while in infants with congenital malformations a significantly higher number had rubella infection. It is concluded that rubella and CMV infections are commonly seen in children with intrauterine infections¹¹. In a study, involving 917 women and 99 newborn babies who were jaundiced, or who died within a few days of birth or who showed gross congenital abnormalities, IgM antibodies to cytomegalovirus (CMV), Herpes simplex virus type 2 (HSV-2) and rubella virus were detected indicating the importance of this virus in intra-uterine infection¹². Congenital rubella syndrome (CRS) and congenitally infected babies were born from 12 high-risk mothers in Japan and authors strongly advocated more intensive immunization to eradicate CRS completely in Japan⁷. An outbreak of Rubella was recorded in Brazil and an attempt was made to prevent by vaccination⁸.

The epidemiology of rubella and CRS has changed significantly in the last decade. These changes and molecular typing suggest that the United States is on the verge of elimination of the disease. This is mainly achieved by vaccination program. During the 1990s, the incidence of rubella in children younger than 15

years decreased (0.63 vs 0.06 per 100 000 in 1990 vs 1999), whereas the incidence in adults aged 15 to 44 years increased (0.13 vs 0.24 per 100 000). 23 CRS infants were born to foreign-born mothers. The findings indicate sustained low incidence of rubella and CRS since 1992^{13,14}. Rubella vaccine has emerged as the most effective public health measure against the well known crippling consequences of congenital rubella infection (CRI). After the devastating pandemic of rubella between 1962 and 1965, United States licensed the use of vaccine in 1969, which resulted in 99% reduction of cases¹⁵. In 1996, the Immunization Working Group of the Mexico-United States Binominal Commission was established to enhance coordination of disease surveillance, assure high vaccination coverage in both countries, and hasten the elimination of vaccine-preventable diseases. The United States and Mexico share the Pan American Health Organization (PAHO) goal of measles elimination by 2000¹⁶.

No country in sub-saharan Africa vaccinate against rubella. It is recommended that countries wishing to undertake prevention program for CRS should either mount vaccination programs for adolescent girls or women of reproductive age or offer universal vaccination in infancy as part of routine childhood immunizations, accompanied by serological surveillance of women of reproductive age¹⁷. In this laboratory of Eritrea, the number Rubella cases detected in 2006 was 69 and measles 3. At outset, it appears that the number of Rubella cases is on the rise, while the number of measles cases is on decline. The cases were referred as suspected measles cases which were also tested for rubella antibodies to detect rubella infection. Therefore it is likely that the actual number of rubella cases in the community could be higher than actual numbers reported. This indicates the vaccine against measles is effective. Many studies¹⁸⁻²² conducted recently in different countries around the globe, emphasize the need for a continued strong public health commitment to increase the proportion of vaccinated individuals and with priority to immunize women of child bearing age.

CONCLUSION

Introduction of Measles vaccine and control program successfully controlled the cases of Measles in Eritrea but not Rubella. Many countries have adapted MMR vaccine (Mumps, Measles, and Rubella) and successfully controlled Rubella cases. Rubella causes periodic outbreaks. In Eritrea, effective Measles control program by vaccination resulted in decrease in number of measles cases in children. Results of this study strongly advocate the introduction of MMR vaccine and effective surveillance of Rubella cases. The presence of Measles Reference Laboratory which also

screens specimens for rubella makes surveillance and detection effective. Although exact picture of Rubella cases in community and incidence of CRS in infants is not known, all these cases can be prevented by effective vaccination.

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Histomorphological Study of Malignant Tumours of Liver

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INTRODUCTION

Liver tumours are usually detected either by routine physical examination or by different imaging techniques¹. In spite of the rapid development of these diagnostic tools, histopathological study of liver tissue has retained its central place².

Liver is affected by both benign and malignant tumours. The majority of the primary tumours can be classified according to the indigenous cells of the liver (hepatocytes; bile duct epithelium and endothelium) from which they arise.

MATERIALS AND METHODS

This study was undertaken to observe the histomorphological features in primary and metastatic malignant tumours of the liver. The material for the present study was collected from the data available in the Pathology Department, J.J.M. Medical College, Davangere, during the period of ten years from January 1993 to December 2002. The study material consisted a total of 125 liver tissue samples with histologically proven malignancy. It includes 124 ultrasound guided needle biopsies and one wedge biopsy. Benign tumours and non neoplastic lesions of the liver are excluded from this study.

Clinical details are obtained by studying the hospital records in 77 old cases during the period of eight years from January 1993 to December 2000. In the remaining two years, from January 2001 to December 2002, 48 patients were examined and clinical details were noted. Ultrasonography findings of the liver were available for scrutinization in only 24 cases. Liver tissue sampling and method of obtaining liver tissue were at the discretion of the clinician. Liver tissue samples were subjected to naked eye examination and

were fixed in 10% formalin. They were routinely processed to obtain 5-7 micron thick paraffin sections. They were routinely stained with Haematoxylin and Eosin stain. Other stains employed when required were

1. Von Gieson's stain
2. Gomori's reticulin stain
3. Periodic acid schiff stain (with or without diastase) and
4. Prussian blue stain

Patients were subjected to routine haematological and urine investigations. Liver function tests including tests for HBsAg and HCV antibodies were done depending on the clinical requirement. All the cases were subjected to detailed study.

OBSERVATIONS

This study deals with the determination of the histomorphological features in primary and metastatic malignant tumours of the liver. During the period of the present study, 125 patients with histologically proven malignant liver tumours were encountered in the Department of Pathology, J.J.M. Medical College, Davangere. These malignant liver tumours formed 0.23% of 53,273 total surgical specimens received during the same period. During this period, these tumours formed 57.1% of the 219 liver biopsies and 14.42% of the 867 histologically proven malignant lesions present at various sites. The following observations were made in this study.

Age

Age of the patients having malignant liver tumours ranged from 2½ years to 74 years. 39 patients (31.2%) belonged to the age group of 41-50 years.

Table I. Showing Distribution of Malignant Liver Tumours In Different Age Groups

Age group	No. of cases	Percentage
0 – 10	1	0.8
11 – 20	2	1.6
21 – 30	5	4.0
31 – 40	20	16.0
41 – 50	39	31.2
51 – 60	24	19.2
61 – 70	22	17.6
71 – 80	12	9.6
Total	125	100

Sex

In this study, 100 patients, (80%) were males and 25 patients (20%) were females. Male to female ratio was 4:1.

Table II. Sex Distribution of Malignant Liver Tumours

Sex	No. of cases	Percentage
Male	100	80
Female	25	20
Total	125	100

Sex incidence in the different age groups showed male preponderance in all the age groups. Higher incidence of malignant liver tumours in both males (33%) and females (24%) was observed in the age group of 41-50 years.

Table III. Showing Age and Sex Distribution in Malignant Liver Tumours

Age in years	Males	Percentage	Females	Percentage	Total	Percentage
1 – 10	1	1	-	-	1	0.8
11 – 20	2	2	-	-	2	1.6
21 – 30	4	4	1	4	5	4.0
31 – 40	15	15	5	20	20	16.0
41 – 50	33	33	6	24	39	31.2
51 – 60	18	18	6	24	24	19.2
61 – 70	17	17	5	20	22	17.6
71 – 80	10	10	2	8	12	9.6
Total	100	100	25	100	125	100

BLOOD GROUP:

Blood group determination was done in 16 cases. Among these 10 patients belonged to B (positive) blood group. Three patients belonged to A (positive), two patients had O (positive); and remaining one patient had AB (positive) blood group.

Table IV. Showing The Frequency Of Different Clinical Features In Malignant Liver Tumours (125 Cases = 100%)

Sl. No.	Clinical Features	No. of Cases	Percentage
1	Loss of appetite	75	60.0
2	Loss of weight	47	37.6
3	Weakness and lassitude	35	28.0
4	Distension of abdomen	48	38.4
5	Pain abdomen	43	34.4
6	Fever	25	20.0
7	Nausea and vomiting	20	16.0
8	Pedal oedema	21	16.8
9	Diffuse hepatomegaly	53	42.4
10	Jaundice	13	10.4
11	Ascites	25	20.0

Liver Tissue Samples

In this study, of 125 malignant liver tumours, 124 were studied by ultrasound guided needle biopsies (99.2%) and one specimen was operative wedge biopsy (0.8%).

Table V. Showing Types Of Liver Tissue Samples

Sl. No.	Specimen	No. of Cases	Percentage
1	Ultrasound guided needle biopsy	124	99.2
2	Operative wedge biopsy	1	0.8
	Total	125	100

Types of Liver Tumours

In this study malignant liver tumours were classified according to the nomenclature recommended by The World Health Organization, (International Histological classification of tumours, No. 20, WHO 1978)⁴. Among 125 patients of malignant liver tumours, primary malignant epithelial tumours were observed in 106 patients (84.8%) and metastatic

tumours were noted in 19 patients (15.2%). Malignant nonepithelial liver tumours were not encountered in this study. Ratio of primary to secondary malignant tumours was 5.58:1.

Laboratory Investigations

Serum bilirubin with rise in unconjugated fraction was seen in 13 patients with the values ranging from 4mg% to 7mg%. AST was increased in 50 patients with the values ranging from 50 to 110 I.U/L ALT was

increased in 46 patients with the values ranging from 65 to 150 I.U/L. Serum alkaline phosphatase was in the range of 52 to 84 K.A. units in 46 patients. Albumin to globulin ratio in serum was reversed in two cases. Serum was positive for HbsAg in six patients, among 16 patients who were tested for HbsAg. Test for HCV antibodies was done in one patient which showed absence of HCV antibodies. In 20 cases, where ascites was present, malignant cells were non seen in ascitic fluid.

Table XVI. Showing Histological Types In Primary Lesion In Metastatic Tumours of Liver

Sl. No.	Histological type	Primary site	No. of Cases	Percentage
1	Well differentiated adenocarcinoma	Stomach	1	5.27
2	Well differentiated adenocarcinoma	Oesophagus	1	5.27
3	Well differentiated adenocarcinoma	Unknown	12	63.16
4	Poorly differentiated carcinoma	Unknown	4	21.03
5	Embryonal tumour	Unknown	1	5.27
	Total		19	100

Age

Age of these patients having metastatic liver tumours ranged from 11 years to 71 years. Six patients (31.58%) belonged to the age group of 41-50 years.

Sex

In this study of 19 patients, 15 patients (78.95%) were males and four patients (21.05%) were females. Male to female ratio was 3.75:1. Higher incidence of metastatic liver tumour 31.58% was observed in the age group of 41-50 years.

Table XVII. Incidence of Metastatic Tumours in Different Age Groups and Their Sex Distribution

Age in years	Males	Percentage	Females	Percentage	Total	Percentage
11 – 20	2	13.33	-	-	2	10.52
21 – 30	0	-	1	25.00	1	5.27
41 – 50	5	33.33	1	25.00	6	31.58
51 – 60	4	26.68	1	25.00	5	26.32
61 – 70	2	13.33	1	25.00	3	15.79
71 – 80	2	13.33	-	-	2	10.52
Total	15	100	4	100	19	100

Table XVIII. Showing Frequency of Clinical Features in Metastatic Tumour in The Liver in 19 Cases (100%)

Sl. No.	Clinical Features	No. of Cases	Percentage
1	Loss of appetite	6	31.57
2	Loss of weight	1	5.26
3	Weakness and lassitude	9	47.36
4	Distension of abdomen	9	47.36
5	Pain abdomen	7	36.84
6	Fever	9	47.36
7	Nausea and vomiting	7	36.80
8	Pedal oedema	6	31.57
9	Diffuse hepatomegaly	1	5.26
10	Ascites	5	26.31

Ultrasonography reports were available in three cases which showed multiple mixed echoic regions in right lobe of liver, varying in size from 1cm to 5cms.

Serum alkaline phosphatase was markedly increased by 200 K.A. units in one patient. In five patients having ascites, ascitic fluid was a transudate and malignant cells were not seen in the ascitic fluid.

Ultrasound guided liver biopsy was done in all the 19 patients. Linear grey white biopsy material of 0.5cm to 1cm length was obtained in 14 patients. In five patients needle biopsy material was grey white and fragmented.

Microscopy

Metastatic adenocarcinoma was seen in 14 cases,

where liver biopsy showed well differentiated adenocarcinoma. Tumour cells were forming glandular pattern. These tumour cells were large and had large vesicular nuclei with conspicuous nucleoli and pale vacuolated cytoplasm. Subsequently these patients were subjected for detail examination to locate the primary. In one patient repeat ultrasonography revealed an irregular growth in the body of stomach. In one case, patient had growth in the lower end of oesophagus, detected by endoscopy. In the remaining 12 patients primary remained unknown.

In four patients liver biopsy showed metastatic poorly differentiated carcinoma, where tumour cells were forming compact masses and sheets. These tumour cells were large and had large vesicular nuclei pale staining cytoplasm, nuclear chromatin was irregularly condensed. In these patients primary could not be ascertained.

In one patient, who was a 11 year old boy, liver biopsy showed metastatic embryonal tumour, where tumour cells were forming solid nests amidst the hepatocytes. These tumour cells were small having large densely staining nuclei and scanty cytoplasm. Background was myxoid. In this case primary was not ascertained.

DISCUSSION

Liver tumours, come to attention for a variety of reasons. They may generate epigastric fullness and discomfort or be detected by routine physical examination or imaging techniques for other indications. The importance of recognising these lesions, is to perform guided percutaneous biopsies, with subsequent histopathological typing¹. In the present study the relative incidence of different malignant liver tumours and their histomorphological features were analysed.

In this study, 125 patients with histologically proven malignant liver tumours were studied. These malignant liver tumours formed 0.23% of 53,273 specimens received during the period of present study. This indicates the rarity of malignant liver tumours. These lesions formed 57.1% of the 219 liver biopsies performed during the same period, indicating that liver biopsies were performed more frequently for hepatic masses than other liver lesions. Malignant liver tumours formed 14.42% of the 867 malignant lesions at various sites, detected during the period of this study. This indicates that these lesions are one of the common malignant tumours observed in this geographic area.

Malignant liver tumours were frequently seen (31.2%) in the age group of 41-50 years and there was marked male preponderance with male to female ratio

of 4:1. Blood group analysis was possible in only a few cases and these tumours were seen commonly in B-positive blood group individuals. The commonest clinical features associated with these tumours were, loss of appetite, loss of weight, weakness and lassitude, distention of abdomen, pain abdomen, fever, nausea and vomiting, pedal oedema, diffuse hepatomegaly, jaundice and ascites.

In this study among 125 malignant liver tumours, 124 cases were studied by ultrasound guided needle biopsies and only one sample was a operative wedge biopsy. But ultrasonography reports were available for scrutinization in only 24 cases. All these tissue samples were routinely processed to obtain paraffin sections and were studied after Haematoxylin and Eosin stain. PAS stain was useful in demonstrating glycogen in HCC and for demonstrating mucin in cholangiocarcinoma. Gomori's reticulin stain was useful for outlining the thick liver cell plates. VonGieson's stain was useful in demonstrating fibrocollagenous tissue. Prussian blue stain was used to demonstrate iron granules, but there were no cases of haemochromatosis in this study.

In this study the nomenclature and classification recommended by WHO, 1978 was used⁴. Primary malignant epithelial tumours (84.8%) were more frequently observed than metastatic tumours (15.2%). Malignant nonepithelial tumours were not observed. These nonepithelial tumours are infrequent in other studies also. Among primary malignant epithelial tumours, HCC was more frequent (79.2%) followed by cholangiocarcinoma (4.8%) and hepatoblastoma 0.8%. Similar incidence was observed by other authors^{3,4}.

Other tumours like bile duct cystadenocarcinoma, combined hepatocellular and cholangiocarcinoma and undifferentiated carcinoma were not encountered in this study.

Metastatic tumours are more frequent than primary metastatic tumours. In the present study metastatic tumours in the liver were less frequent. This may be attributed to the fact that, most of the malignant tumours after histological examination are referred to referral cancer hospitals for further management. Most of the metastatic lesions in this study were routinely detected when ultrasonography was done for unrelated clinical presentation. ultrasound guided needle biopsies in these cases, showed well differentiated adenocarcinoma in 14 patients, of whom primary was subsequently identified in stomach in one case and oesophagus in another case, and in the remaining 12 cases, primary remained unknown. Needle biopsies showed poorly differentiated carcinoma in four cases where primary was unknown. In a 11 year old boy hepatic lesion showed metastatic embryonal tumour

and primary could not be located. As primary remained unknown in majority of these metastatic lesions, examination by ultrasound guided needle biopsy became essential for establishing the lesion. The strategy of aetiological diagnosis of hepatic metastases is based on histological features of these lesions. In these studies involvement of liver by leukemia, lymphoma and malignant mesenchymal tumours were not observed.

With increasing use of guided needle biopsies in the diagnosis of malignant liver tumours, histopathological study has become an important diagnostic tool. The clinician may now choose from a variety of imaging techniques. It is recommended that these patients have base line and serial liver scans, liver function tests and tumour marker estimations. There is no doubt that rapid technologic improvements will continue to alter our diagnostic approach to this disease⁵.

CONCLUSION

Histomorphological study of primary and metastatic malignant tumours of liver was undertaken during the period of January 1993 to December 2002.

Malignant liver tumours formed 0.23% of the total number of surgical specimens. They formed 57.1% of liver biopsies and 14.2% of the malignant lesions, detected during the same period. Majority of the malignant liver tumour (31.2%) belonged to the age group of 41-50 years. Male to female ratio in malignant liver tumours was 4 : 1. Ultrasound guided needle biopsy was used more frequently (99.2%) to diagnose malignant liver tumours. Primary malignant epithelial tumours were more frequent (84.8%) and metastatic tumours were less frequent (15.2%). Ratio of primary to secondary malignant tumours was 5.58:1. Primary malignant epithelial tumours were hepatocellular carcinoma (79.2%); cholangiocarcinoma (4.8%) and hepatoblastoma (0.8%). Hepatocellular carcinoma formed 79.2% of malignant liver tumours. They formed 0.19% of the surgical specimens; 45.21% of liver biopsies and 11.42% of the malignant lesions at different sites detected during the same period. Hepatocellular carcinoma should rising incidence from 1993 to 2002. Majority of HCC patients belonged to the age group to 41-50 years (30.30%). Male to female ratio in HCC was 5.19:1. Commonest clinical features in HCC were loss of appetite, diffuse hepatomegaly and loss of weight. In HCC, increase in unconjugated bilirubin, increase in transaminases and alkaline phosphatase levels were observed in varying number of cases. A:G ratio was reversed in two cases. Six patients of HCC were positive for HBs Ag. Ultrasonography was useful in detecting solitary, diffuse and multifocal lesions of HCC. There was

ultrasonographic evidence of cirrhosis in two cases. Histological patterns observed in HCC were trabecular; trabecular and psuedoglandular, compact and pseudoglandular pattern's in the decreasing order of frequency. Tumour cell types observed in HCC, in the decreasing order of frequency were hepatic type; pleomorphic type; clear cell type; anaplastic type; and spindle cell type. Intracellular inclusions observed in this study were intranuclear cytoplasmic inclusions globular hyaline bodies and Mallory's hyaline inclusions in varying number of cases. 67.68% of HCC belonged to grade II according to grading system of Edmondson and Steiner. Cholangiocarcinoma formed 4.8% of the malignant liver tumours. Age of the patients of cholangiocarcinoma ranged from 40-70 years. Male to female ratio in cholangiocarcinoma was 1:5. Diffuse hepatomegaly was seen in all the six cases of cholangiocarcinoma. Tumour cells in cholangiocarcinoma were arranged in tubular pattern and compact masses. They were associated with abundant fibrous stroma. Mucin secretion was seen in one case of cholangiocarcinoma. Hepatoblastoma was diagnosed by needle biopsy in 2½ year old boy. Metastatic tumours in liver formed 15.2% of malignant liver tumours. Commonest histological type of metastatic lesions, was well differentiated adenocarcinoma. Primary was detected only in two cases of metastatic well differentiated adenocarcinoma. In the remaining cases, primary could not be located.

In the recent years there are rapid advances in the diagnostic imaging technology. This has led to differences in experiences and results among investigators. Liver biopsy has become an essential tool and diagnostic efficiency can be further improved when combined with immunohistochemistry, electron microscopic study and molecular biology techniques, coupled with serological marker study.

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Management of Bell's Palsy - A Case Study

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ABSTRACT

Facial nerve supplies to muscles of face and responsible for both forcible and smooth closure of eye lids and facial expressions. Facial nerve has three nuclei; 1. Main motor nucleus 2. parasympathetic nucleus 3. sensory nucleus .Motor nucleus supplies to muscles of face and responsible for facial expression and closure of eyelids. Facial nerve carries taste sensations from anterior 2/3 rd of tongue and cutaneous sensations from external auditory metus. In present case patient had sudden onset of left side facial palsy which completed over 24 -36 hours. She underwent lateral tarsal strip surgery, lee medial canthoplasty of lower lid and recession of upper lid retractors of left eye and had good cosmetic and symptomatic improvement.

Key words: Facial nerve, Ectropion, Lagophthalmos, Medial canthoplasty, Lateral tarsal strip surgery.

INTRODUCTION

Bell's palsy is an acute idiopathic, unilateral, most common, peripheral, lower motor neuron facial nerve paralysis. It is named after Scottish anatomist Charles Bell. Possible etiology includes viral infections particularly herpes simplex, diabetes mellitus, hypertension. The symptoms on affected side typically include inability to close the eyes & to smile. Lower eye lid may turn outwards. Wrinkle the forehead & whistle affected. Speech may be mildly slurred. Tearing occur because eye does not close completely. Taste sensation diminished on front half of the tongue. Sounds may appear on louder side. Most people develop maximum weakness within 48 hours. Bilateral involvement in less than 1%. Recurrence & bilateral involvement suggests myasthenia gravis. Incidence of Bell's palsy 20 to 30 cases per one lakh people per year. A strong family history found in 2 to 4% of cases. Incidence equal in both sexes. Average age onset 20 to 40 years but may occur at any age [1]. Incidence is lowest in children under 10 years. Left & right sides of

the face involved with equal incidence. One in 60 people being effected during life time. Incidence is higher in pregnant women. 71% of untreated patients will completely recover; 84% are complete or nearly normal recovery within 6 months.

Prognosis depends on age over 55 years, no recovery by 3 weeks, hypertension, diabetes mellitus, pregnancy, complete facial weakness & parotid tumors. Goal of treatment is preventing sequelae. Both corticosteroids & antiviral agents used as treatment strategies medically. Mime therapy in the form of physiotherapy is another option of treatment. Surgical treatment required to improve cosmetic appearance.

CASE REPORT

Kamamma female 60 years presented with watering of left eye and inability to close left eye for the last 3 years Figure 1. On examination drooping of left half of face, deviation of mouth towards right side, loss of wrinkles on left half of forehead, severe paralytic ectropion of left lower eye lid and lagophthalmos left eye. Left eye is pseudophakia and right eye has immature senile cataract. Patient has good Bell's phenomenon. Visual acuity in right eye is 6/60 and in left eye is 6/12. Blood pressure is 130/80 mm of Hg. No sensory or motor deficits noted. Taste sensations from anterior two thirds of tongue normal. No h/o hyperacusis.

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Preoperative



Fig:1. Paralytic Ectropion lower lid & Lagophthalmos.

A clinical diagnosis of Bell's palsy with severe paralytic ectropion of lower lid and lagophthalmos left eye was made. Routine hematological investigations like TC,DC,ESR and biochemical investigations like blood sugar, renal function tests, serum calcium were normal. H.I.V was negative, V.D.R.L was non reacting.

X ray chest p. a was normal. C.T scan brain was normal. Syringing was patent in both eyes. Lee medial canthoplasty, lateral tarsal strip and recession of upper lid retractors done under local anesthesia to improve cosmetic appearance and symptoms Figure 2. Post-operative period was uneventful. Skin sutures removed on 7th day.

Post operative



Fig:2. Lee medial Canthoplasty & Lateral Tarsal Strip Surgery.

DISCUSSION

Bell's palsy or idiopathic facial nerve palsy is dysfunction of cranial nerve V11 (the facial) that results

in inability to control facial muscles on effected side. Several conditions like brain tumors, stroke, Lyme's disease, HSV Type 1,diabetes mellitus, sarcoidosis, brucellosis, Ramsay Hunt syndrome, Gullian –Barre syndrome, Leprosy, Melkersson-Rosenthal syndrome can cause acute fascial nerve palsy. If no specific cause can be identified the condition is called Bell's palsy. It is named after Scottish anatomist Charless Bells. Bell's palsy is the most common acute mononeuropathy and is the most common cause of acute facial nerve paralysis.

Bell's palsy is usually self-limiting and unilateral. Bilateral cases occur in 1% of cases¹.It affects approximately 1 person in 60 during a lifetime. Familial inheritance in 4-14%cases⁵.It is three times more common In pregnant women than non-pregnant women.[6].Four times more common in diabetics than general population⁷.

Facial nerve nuclei are in brainstem and facial nerve supplies all muscles concerned for facial expression. Sensory component is through nervous intermedius. It conveys taste sensations from anterior two thirds of tongue and cutaneous impulses from anterior wall of external auditory metus. Motor nucleus lies anterior and lateral to abducens nucleus.

It is thought that an inflammatory condition leads to swelling of facial nerve. During its course, as nerve travels through a narrow bony canal beneath ear swollen nerve compressed, leads to nerve inhibition and damage or death. No readily identifiable cause for Bell's palsy has been found. Exposure to trauma, environmental factors, metabolic and emotional disorders, emotional stress, environmental stress (e.g. cold), physical stress (e.g. trauma) etc. may precede onset.

Corticosteroids have been found to improve outcome while anti-viral drugs have not³.Most of people recover spontaneously and achieve near normal function.

Facial nerve controls a number of functions like blinking, closing the eyes, smiling, frowning, lacrimation and salivation, innervates stapedius and carries taste sensations from anterior two thirds of tongue. Onset of Bell's palsy is abrupt and maximum weakness attained in 48 hours.Pain in ear may precede the paralysis for a day or two. Taste sensations may be lost unilaterally and hyperacusis may present.

Bell's palsy characterized by facial drooping on effected half, inability to control movements of facial muscles, paralytic ectropion, inability to close upper lid, exposure keratitis and its complications. The paralysis is of lower motor neuron type.

Clinician should determine whether fore head muscles are spared. Fore head muscles receive innervations from both hemispheres of brain. In upper motor neuron type of facial palsy fore head muscles are spared. But Bell's palsy is lower motor neuron type and fore head muscles are involved. The degree of nerve damage can be assessed using House - Brackmann scoring.

Bell's palsy is a diagnosis of exclusion; by elimination of other reasonable possibilities. No specific cause can be ascertained. Bell's palsy is commonly referred to as idiopathic or cryptogenic i.e. unknown cause. Morris A. M, et. al described that a large number of patients (45%) are not referred to a specialist, which suggest that Bell's palsy is considered by physicians to be a straight forward diagnosis that is easy to manage⁴. Since diagnosis of Bells palsy is by exclusion it requires through investigations specialist opinion before starting treatment.

Investigations: E.S.R, Blood Sugar, Lyme titer, ACE levels, chest imaging studies, lumbar puncture, Gadolinium enhanced M.R.I scan, H.I.V screening, V.D.R.L, F.T.A -ABS . Electro diagnostic tests like stapedius reflex test, electromyography, audiography may help in accessing prognosis.

TREATMENT

Medical therapy: Systemic therapy with oral steroids such as prednisolone significantly improves recovery at 6 months and is recommended.

Anti-viral like acyclovir proscribed due to theoretical link between Bell's palsy and herpes simplex and varicella zoster virus³.

Local therapy- Topical lubricants eye drops, lubricant eye ointments at night, advised to wear dark glasses in outdoors, Occluding lids with tape, external eye lid weights, Punctual plugs, Injecting Botullinum toxins into upper lid and lower lid retractors. Topical antibiotics and cycloplegic if exposure keratitis present.

SURGICAL THERAPY

- A. **Correcting lower lid droop and ectropion** - Face lift, Lee medial canthoplasty, lateral tarsal strip surgery, Facial sling with facia lata, recession of lower lid retractors.
- B. **Correcting lagophthalmos** - Implantable devices like gold plate surgery, Trasorrhaphy, transpositioning temporalis muscle, reinnervation of facial nerve, upper lid retractor recession .
- C. **Correcting brow ptosis** - By direct or indirect brow lifts.

D. Correcting cheek ptosis - By mid face lift.

Prognosis: Prognosis is usually better for younger individuals and in patients older than 60 years prognosis is worse. Even without any treatment Bell's palsy tend to carry good prognosis. In a 1982 study when no treatment was available, of 1,011 patients, 85% showed first signs of recovery within three weeks after onset. For the other 15% recovery occurred 3-6 months later. After a follow-up of at least one year or until restoration, complete recover had occurred in more than two thirds (71%) of al patients. Recovery was judged moderate in 12% and poor in 4% of patients⁴. the patients who regain movements within the first two weeks nearly always remit entirely. When remissions does not occur until the 3rd week or later, patients develop complications⁵.

Major complications are chronic taste loss (ageusia), chronic facial spasm exposure keratitis and its complications, during regeneration some nerves may side track leading to silkiness and around 6% of patients exhibit crocodile tear syndrome or gustatolacrimal reflux syndrome.

Although defined as mononeurotic, patients diagnosed with Bell's palsy may have myriad of neurological symptoms including facial tingling, moderate or severe headache, neck pain ,memory problems, balance problems, ipsilateral limb parasthesias, ipsilateral limb weakness that are unexplained by facial nerve dysfunction. This is yet an enigmatic facet of this condition.

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Correlation Between Body Mass Index With Fasting Blood Sugar and Lipid Profile in Young Adult College Students of South Indian Population

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ABSTRACT

Objectives: To investigate fasting blood sugar (FBS) and lipid profile in young adult college students to correlates with BMI to find out risk factor for cardiovascular diseases. (CVD)

Design: Observational cross sectional study.

Materials & Methods: Students of SS Institute of Medical Science and Research Center, Davanagere, Karnataka were assessed for anthropometric measures, fasting blood sugar and their lipid profiles at central Lab of Biochemistry department during Jan 2010 to Jun 2010.

Results: Among 257 students male were 130 and female were 127. In 130 male students 11 were underweight i.e., their BMI was < 19 Kg/m², 94 were of normal that is their BMI was between 19 Kg/m² - 26 Kg/m² and 25 were overweight with BMI of >26 Kg/m². In 127 female students 21 were underweight i.e., their BMI was < 19 Kg/m², 82 were of normal that is their BMI was between 19 Kg/m² - 26 Kg/m² and 24 were overweight with BMI of >26 Kg/m². The mean BMI of males is 22.5±6.36 Kg/m² and females is 22±5.65 Kg/m² Mean BMI of the three groups in the 130 male students was 22.66±3.36 and that in 127 female is 21.36±3.49. Mean fasting blood sugar level in male is 82.25±9.48 mg/dl, and in female 83.03±10.62 mg/dl. Mean total cholesterol level in male is 155.75±28.05 mg/dl and in Female 161.43±27.33 mg/dl. Mean Triglyceride level was in male 95±39.65 mg/dl and in female 96.08±29.66 mg/dl. Mean HDL-C level was in male 39.41±3.94 and in female 39.29±4.60. Mean LDL-C level was in male 96.51±23.17 and in female 103.17±24.57. Mean VLDL level in male was 18.48±7.78 and that in female 18.95±6.21.

Conclusion: The prevalence of obesity in adult college students shows 1.5% in male and 1.16% in female. Compare to male and female the fasting blood sugar, Cholesterol, LDL and triglycerides levels are higher and significant in female than male. This result indicates females are more prone to develop cardiovascular diseases.

Key words: Facial nerve, Ectropion, Lagophthalmos, Medial canthoplasty, Lateral tarsal strip surgery.

INTRODUCTION

Obesity is a state characterized by a relatively absolute excess fat stored in the adipose tissue. Fatty tissues are normally present in the organism in

reasonable quantity that is proportional to the height of an individual. The exact measurement of these fatty tissues is difficult¹. Several anthropometric measures have been used to investigate the association between adiposity and cardiovascular disease. Body mass index is perhaps the most commonly used measurement². The BMI is also referred to as the Quetelet index i.e., defined as weight/height². Risk of obesity begins when the BMI is greater than 25(Kg/m²)³. It is the most commonly used indicator of health risks associated with over weight (type II diabetes mellitus, insulin resistance and cardiovascular diseases) and underweight (Osteoporosis, infertility)⁴.

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It has been suggested that the rate of weight gain during childhood may be a more significant factor for adult cardiovascular risk than an isolated measurement of weight at any single point in time⁵. Lipids and lipoproteins are well known risk factors for ischemic heart diseases. Elevated levels of triglycerides, cholesterol and LDL-C are documented as risk factors for atherogenesis⁶. Significant proportions of morbidity & mortality in obese adults are due to sudden cardiac arrest and congestive heart failure related to obesity⁷. Considering the probable disorders of lipid profile & acceleration of atherosclerosis process in high risk groups, this work assessed the lipid profile of a randomly selected group of adult college student populations. The prevalence of lipid risk factors was found to be mostly affected by age rather than by sex⁸.

Few studies have been conducted in order to determine the correlation of cardio vascular risk factors with simple anthropometric measurements in Indian population. No study had examined as CVD risk in young adult college students asymptomatic for CVD. To give a proxy profile on the CVD risk studies among such people the present study was conducted. We observed a high prevalence of CVD RISK factors among a relatively young population across the selected industrial population⁹. Cardiovascular diseases are the leading causes of death worldwide. Their incidence particularly coronary heart disease (CHD) is increasing among young adult. Few data exist on the prevalence of risk factors in young adult college students⁸.

Present study is aimed to identify distribution of lipid profile and the prevalence of overweight and

obesity in non diabetic adult Indian population. Recent studies have indicated that the life expectancy of adults with sever obesity might be 15 to 20 years lower than normal individual⁷. Prevention of risk factors for cardiovascular diseases (CVD) such as obesity and dyslipidemia has been an important change in developing countries due to the westernization of diet and life style changes¹⁰.

MATERIAL & METHODS

Two hundred fifty seven healthy individuals of both sex with confirmed consent aged between 18 to 23 years. Their height and weight were recorded. Body mass index was calculated by using their height (m²) and weight (Kg). On the basis of BMI all students were divided into three groups ie., underweight whose BMI was less than 19 Kg/m², normal whose BMI was between 19-26 Kg/m² and overweight whose BMI was more than 26 Kg/m². Plasma was prepared from blood samples collected in plain and fluoride bulbs for measurements from subjects in the morning after an overnight fast of 12 hours. Plasma glucose was determined by Trinder,s method (GoD) and Serum triglycerides are estimated by McGowan et al and Fossati et al. HDL-C estimated by Burstein et al. Total Cholesterol by modified Roeschlau’s method on XL 600 auto-analyzer. Low-density lipoprotein cholesterol (LDL-C) and VLDL were estimated using the Friedwald, Levy and Fredrickson formula. Stastical analysis was done on Epi-Info-6. The means of the three groups were compared by ANOVA at the significance level of a=0.05. Correlation co-efficient was determined for the dependent variables of lipid profile with BMI (Kg/m²) as the independent variable.

RESULT

Table 1. Biochemical parameters, Fasting blood sugar and Lipid Profiles, in male students of different BMI groups.

Parameters	Underweight(n=11)	Normal Subject(n=94)	Overweight(n=24)
Fasting blood sugar	78.27±8.86	80.93±8.91	89.00±9.02
Triglycerides(mg/dl)	67.45±17.32	88.47±31.00	131.68±49.74
Total Cholesterol(mg/dl)	138.09±15.34	147.93±22.93	192.96±16.42
HDL-C(mg/dl)	39.55±2.42	39.34±3.95	39.60±4.53
LDL-C(mg/dl)	82.82±14.04	90.50±19.71	125.12±14.77

Table 1 shows the mean FBS, TAG, Total Cholesterol, HDL, LDL and VLDL values are higher in overweight than the normal subject of the male students.

Table 2. Biochemical parameters, fasting blood sugar and Lipid Profiles, in Female students of different BMI groups.

Parameters	Underweight(n=21)	Normal Subject(n=82)	Overweight(n=24)
Fasting blood sugar	78.24±6.59	80.90±10.07	94.71±6.64
Triglycerides(mg/dl)	83.62±20.39	92.15±27.70	120.42±30.69
Total Cholesterol(mg/dl)	140.79±15.58	156.37±25.21	190.71±22.03
HDL-C(mg/dl)	40.38±3.92	39.22±8.78	38.58±4.51
LDL-C(mg/dl)	89.62±15.50	99.51±23.55	127.50±17.36
VLDL(mg/dl)	16.9±5.12	17.94±5.71	24.21±6.12

Table 2. Shows the mean FBS, TAG, Total Cholesterol, HDL, LDL and VLDL values are higher in overweight than the normal subject of the female students.

Table 3. Comparison of biochemical parameters in Male & Female Medical students

Parameter	Males		Females				
	Mean	SD	Mean	SD	Mean Difference	t Value	P* Value, sig
BMI	22.66	3.36	21.36	3.49	1.32	3.07	P<0.05 S
FBS	82.25	9.48	83.07	10.62	0.82	0.65	0.5NS
Triglycerides	95	39.15	96.08	29.66	1.08	0.24	0.8 NS
Total cholesterol	155.76	28.06	161.43	27.33	5.68	1.64	0.1 NS
HDL-C	39.41	3.94	39.29	4.60	0.12	0.21	0.8 NS
LDL-C	96.51	23.17	103.17	24.53	6.66	2.20	0.02 S
VLDL	18.48	7.78	18.95	6.21	0.48	0.54	0.5

*Students unpaired t test

Table 3. shows that the p value is significant in LDL-C and BMI than the other parameters.

Table 4. Correlation Coefficient of BMI, FBS and Lipid Profiles in both male and female medical students.

Parameters	Males		Females	
	Correlation Coefficient	Sig	Correlation Coefficient	Sig
FBS	0.38	P<0.01 S	0.52	P<0.01 S
Triglycerides	0.46	P<0.01 S	0.41	P<0.01 S
Total cholesterol	0.53	P<0.01 S	0.51	P<0.01 S
HDL-C	-0.005	P>0.05 NS	-0.1	P>0.05 NS
LDL-C	0.5	P<0.01 S	0.51	P<0.01 S
VLDL	0.52	P<0.01 S	0.39	P<0.01 S

Table 4. Shows correlation coefficient is non significant in HDL-C but all other parameters have significant coefficient in both male and female.

DISCUSSION

How to define overweight and obesity among Asian individuals as not yet been formally decided. Western countries have been using the general criteria for overweight (BMI> 25) and obesity (BMI>30) with Asian population in their countries, while WHO and Asian countries have recommended or adapted lower BMI cut off points for overweight and obesity¹¹. Body mass index (BMI) used as a marker of adiposity, but it may not be a good measurement of fatness, mainly in extremes of stature and with advancing age¹². Obesity has been largely diagnosed based upon

anthropometric measurements like waist circumference WC and body mass index¹⁰.

Weight gain is of concern during early development because adult obesity and its cardiovascular consequences appear to have their origins during childhood. Young children with obese parents tend to become obese adult¹³. Young adults (mean age, 22 years) in the beaver county lipid study had positive significant correlation between BMI and LDL-C and Triglycerides¹⁴, Conversely weight loss reduces risk in overweight individual¹⁵. A higher body mass index (BMI) has been shown to account for up to 16% of the

global burdens of disease, expressed as percentage of disability/ adjusted life years. In the developed world, 2-7 percent of total health care cost is attributable to obesity. Weight is directly correlated with cardiovascular disease¹⁶. More over the growing prevalence of type II diabetes, cardiovascular disease and some cancers are tied to excesses weight¹⁶.

Cardiovascular diseases (CVD) are the major causes of morbidity and mortality in our society with dyslipidemia contributing significantly to atherosclerosis, thus measurement of plasma lipids would help in identifying people at risk for CVD¹⁷. The cardiovascular diseases burden afflicts both men and women with death accounting the 34% of the deaths in women and 28% in men 2007 (Rosamind et al 2007)¹⁸. The ability to prevent the development of atherosclerosis or alternatively to decrease established atherosclerotic plaques, often referred as regression, has major implications for public health¹⁹.

The casual association between plasma lipid level and risk of coronary artery diseases is established. Raised serum cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) level and decreased high density lipoprotein (HDL) are associated major risk factor for cardiovascular diseases²⁰. The blood level high density lipoprotein cholesterol (HDL-C) in contrast bears an inverse heart diseases²¹.

Although obesity has strong genetic determinants, the increasing prevalence of obesity in populations around the world suggests that environmental factors are promoting or exacerbating the problem²². Increased genetic propensity to develop CVD and increasing prevalence of cardiovascular risk factors are the reasons postulated for high prevalence and greater severity and extent of CVD in Indians. During the past three decade's prevalence of most of the CVD risk factors including diabetes mellitus, hypertension, dyslipidemia etc has increased markedly in India²³.

A 40-year following in Stockholm, Sweden, showed a significant relation between overweight in adolescence and adult premature death and cardiovascular disease²⁴, similarly, a recent evaluation of adults who were enrolled as children in the Harvard Growth Study in the 1920s showed that increased adult morbidity and mortality from coronary heart disease were related to overweight in adolescence²⁵.

Steady increase of cholesterol level has been reported in other Asian countries during the last decades of the 20th century, considerably increase in hypercholesterolemia, hypertriglyceridemia and abnormally low HDL in all age groups of professional populations since past years has recently been reported from China²⁰. A recent study conducted in Greece and

in particular in the Attica region verified this major health issue and showed that the prevalence of adult overweight and obesity were 53% and 20% in men and 31% and 15% in women respectively²⁶.

The health profile of Greeks has dramatically changed during the last decades, leading to high rates of obesity as well as one of the most rapidly increasing death rates from CVD²⁶. Today more than 11 billion adults worldwide are overweight, of which 312 millions are obese¹⁶. A high prevalence of some cardiovascular risk factors in Basra college students was observed⁸. There is a lot of data on the prevalence rates of obesity in the general population in Bahrain and other Arabian Peninsula States²² where the prevalence rate among adults is among the highest in the world²². Prevalence of trend of overweight and obesity has been increasing among adults Arab, probably due to the effects of modernization, affluence, increased food consumption and the concomitant changed to sedentary life styles²².

In this study the mean FBS, TAG, Total Cholesterol, HDL, LDL and VLDL values are higher in overweight than the normal subjects of the male and the p value is significant in LDL-C, the correlation coefficient is not significant in HDL-C but all other parameters have significant coefficient in both male and female.

The present study shows higher values of FBS level in overweight group as well obesity but it is normal range comparatively in other subject groups. The TAG level is higher in overweight groups. The FBS and TAG levels were higher in female than male subjects. This result shows females were more prone to develop DM which leads to CVD

In this study the prevalence of overweight and obesity is 9.72% and 1.5% in male and that in female 9.3% and 1.16% of about 257 students, was higher than that reported in European countries¹⁴ where the prevalence overweight and obesity were 8% and 1% respectively, and among the medical students of Greece University⁸ the prevalence of obesity was 43%. It was lower than that reported in some Arab gulf countries⁸. For example, among Kuwait college students overweight and obesity were prevalent as 38.5% and 11% respectively⁸. Obesity is a major health problem in Kuwait, more than half of adult females and almost 1/3rd of adult males are obese²⁷. Tunisia's adult population, not unlike the expressions of those in industrialized countries, is a currently taking an increase in chronic non communicable diseases, especially CVD²⁸.

As 19.06% students of our total study populations are overweight, so number of risk individuals is much higher. Therefore strategical design to limit

cardiovascular risk should address weight reduction during childhood and adolescence. However, the influence of obesity on cardiovascular risk begins before adulthood and overweight during adolescence is associated with an increased risk of coronary heart diseases in male and female subjects²¹.

The prevalence of obesity in western population varies greatly, but a weighed estimate suggests prevalence between 15% and 20%²². In the United States about one third of the population was overweight and another third was obese²⁵. The prevalence of adult overweight (BMI range 25-29,9) and obesity is increasing regardless of age socioeconomic or ethnicity differences²⁷. As the prevalence of obesity is increasing worldwide, data from epidemiological studies in grebe demonstrate that a considerable proportion of the population is overweight or obese²⁶.

Obesity has been extensively studied as main causes of metabolic disturbance, including metabolic syndrome, nonalcoholic fatty liver diseases and Type-II diabetes mellitus. As a simple and non invasive method for a detection of obesity and dyslipidemia, anthropometric measurements could be efficiently used in clinical and epidemiologic fields¹⁰.

CONCLUSION

The low percentage adult college students with controlled lipid concentrations suggest that there is a need for awareness programs for the prevention and control of dyslipidemia and impaired blood sugar levels. The alarming prevalence of risk factors in such young adult population demonstrates the need for organized efforts for the implementation of local and national level programs to prevent cardiovascular diseases. It has a significant association with different cardiovascular risk factors especially high total cholesterol, LDL, impaired FBS and hypertension.

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Tympanoplasty with and without Mastoidectomy for Non-Cholesteatomatous Chronic Otitis Media

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ABSTRACT

Chronic otitis media is an inflammatory process of the mucoperiosteal lining of the middle ear space and mastoid. Infection represents the single major cause for the failure of tympanoplasty and can result from a hidden mastoid disease. Cortical mastoidectomy is an effective means of repneumatizing the mastoid and eradicating the mastoid source of infection. The effect of mastoidectomy on patients without evidence of active infection remains highly debated and unproven.

Key words: Type I tympanoplasty, Cortical mastoidectomy.

INTRODUCTION

Chronic otitis media is an inflammatory process of the mucoperiosteal lining of the middle ear space and mastoid. Although much has been written about the pathology, treatment modalities and outcome of cholesteatomatous ear disease, little has been mentioned about management of non cholesteatomatous Chronic Suppurative Otitis Media (CSOM)¹. It is well accepted that the main purpose of operation is to obtain permanently dry ear and close the perforation and improve the hearing. The use of mastoidectomy as a means to establish drainage of a complicated infection of the ear sparks little controversy². Well trained, experienced otologists currently remain divided as to the importance of mastoidectomy in the treatment of chronic non-cholesteatomatous suppurative otitis media. However, the use of mastoidectomy to treat chronic drainage or suppuration from otitis media remains an issue of debate. Some authors have thought that mastoidectomy is justified in cases of chronic suppurative otitis media, which have been refractory to maximal antibiotic therapy³. Other authors have argued that closure of tympanic membrane perforations and elimination of chronic drainage can be achieved effectively when performing tympanoplasty with or without mastoidectomy. The non-mastoid causes of graft failure include general disability, technical error, and most importantly – eustachian tube dysfunction.⁴ Mastoid factors include the extent of mastoid pneumatization and the presence of inflammatory disease in mastoid, while there is little

controversy over the importance of non-mastoid factors; otologists have debated the role of mastoid in tympanic membrane reconstruction. Some argue that tympanic membrane perforations should be repaired by type I tympanoplasty alone, regardless of the status of the mastoid, others advocate mastoidectomy coupled with tympanic membrane repair when mastoid condition warrants. Ventilation of middle ear is an essential predictor of functional results following middle ear reconstruction⁵. It is a complex and dynamic process depending upon a number of factors. Most important of which include the functional status of the eustachian tube, the degree of pneumatization of mastoid air cells and the condition of middle ear mucosa. The role of mastoid pneumatization in the middle ear aeration is not exactly known. But it forms an air reservoir and acts as a surge of tank to minimize pressure fluctuation^{6,7}. The exact mechanism of the pneumatization of the mastoid air cell system and the factors influencing the pneumatization are poorly understood. The pneumatization has been linked to hereditary and genetic factors. It has also been related to the size of the skull and the height of the individual⁸. The functional status of the eustachian tube has been correlated to the pneumatization of the mastoid air cells by some authors, whereas, others do not confirm a significant correlation between the two. However, the ears with chronic suppurative otitis media have consistently shown a reduction in the size of mastoid air cell system. The purpose of this study is to examine the role of the mastoid air cells in the tympanic membrane reconstruction^{9,10}. The goal is to determine whether mastoidectomy is an effective means of repneumatizing the mastoid air cell system and eradicating mastoid sources of infection, to analyse the post-operative results for non-cholesteatomatous CSOM treated by tympanoplasty with or without mastoidectomy and to determine whether mastoidectomy is helpful or not.

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MATERIALS AND METHODS

This study comprises of 60 patients with chronic suppurative otitis media safe type in quiescent stage. All the cases were operated during a period of 2 years between June 2005 to June 2007 in the department of ENT, Father Muller Medical College, Mangalore: 30 of these cases were selected for type I tympanoplasty alone (Group A) and 30 cases were selected for type I tympanoplasty with cortical mastoidectomy (Group B).

The work up for these cases consisted of a detailed history and a complete general physical, systemic and ear, nose and throat examination. In all the patient a routine blood and urine examination, X-ray of paranasal sinuses and mastoids, examination under microscope and puretone audiometry were done. Eustachian tube function was assessed clinically. The size of the mastoids was roughly measured by using a graph paper, on which the X-ray film of the mastoid taken in the lateral oblique view was superimposed.

RESULTS

Sixty cases of type I tympanoplasty were studied during a period of two years from June 2005 to June 2007 in the Department of ENT, Father Muller Medical College, Mangalore. The study group comprised of 55 patients, five of whom operated on both the ears, thus making the total number of operated cases sixty. Out of 60 patients 30 cases were selected for type I tympanoplasty alone (Group A) and other 30 cases were selected for type I tympanoplasty with cortical mastoidectomy (Group B).

Table 1. Showing groups

Type I tympanoplasty (Group A)	Type I tympanoplasty with cortical mastoidectomy (Group B)
30 cases	30 cases
Total no. of cases 60	

The age and sex incidence and various factors influencing the success of Type I tympanoplasty were analysed and the following results were observed.

Table 2. Showing range of age

Age (in years)	No. of patients	%
10-19	13	23.6%
20-29	21	38.2%
30-39	14	25.4%
40-49	6	11%
>50years	1	1.8%
Total	55	100%

$\chi^2_{(4)} = 21.636, p = 0.001$ significant

In present study, number of patients were seen in the age group of 20-29 years (38.2%), ($p = 0.001$) with a

mean age of 26.4 years. The youngest patient was 14 years and the oldest 55 years.

Table 3. Age Factor in Successful Type I Tympanoplasty

Age (in years)	No. of cases	Failures	Take-up rates
10-39 years	52	8 (15.3%)	44 (84.7%)
40 years and above	8	2 (25%)	6 (75%)
Total	60	10	

$\chi^2_{(1)} = 0.029, p = 0.865$ (Not significant)

In present series only eight type I tympanoplasties were performed on patients aged over 40 years. The graft take up rates were found to be lower in these patients (75%) compared to that of the younger age groups (84.7%) but statistically not significant.

Table 4. Graft Takeup Rates in Patients with Bilateral CSOM

CSOM-Safe type	No. of cases	Failures	Take-up rates
Unilateral	26	4 (15.4%)	22 (84.6%)
Bilateral	34	6 (17.6%)	28 (82.4%)
Total	60	10	

$\chi^2_{(1)} = 0.054, p = 0.816$ (Not significant)

Presence of bilateral CSOM at the time of Type I tympanoplasty did not seem to have any influence on the graft take up. In present study, 29 patients had bilateral ear disease, but the graft take up rates were similar to that with unilateral CSOM.

Table 5: Size of Perforation with Regard to Graft Up-Take and Audiological Benefit

Size of perforation	No. of cases	Failures	Take-up rates	Average hearing gain
Medium	19	Nil	19 (100%)	6.8 dB
Large	29	3 (4%)	26 (89%)	12.6 dB
Subtotal	12	7 (58%)	5 (42%)	13.4 dB

Adjusted $\chi^2_{(2)} = 18.476, p = 0.0001$ (significant)

Table 6: Audiological Benefits between the types of perforations

	N	Mean	Std. deviation	95% confidence interval for mean		Minimum	Maximum
Medium	19	6.84	4.682	4.59	9.10	0	18
Large	26	11.85	6.044	9.40	14.29	0	28
Subtotal	5	13.40	3.507	9.05	17.75	8	17
Total	50	10.10	5.877	8.43	11.77	0	28

$F_{(2,47)} = 5.808, p = 0.006$ (Significant)

Higher failure rates were noticed with increasing size of perforation, irrespective of the surgical approach. However, in successful cases of type I tympanoplasty, patients with subtotal and medium sized perforations showed a better audiological improvement (13.4 dB).

According to multiple comparison test significant difference observed between Large and medium central perforations, medium and subtotal perforations.

Table 7. Relation of the Mastoid Size of Graft Uptake Type I tympanoplasty (Group A)

Size of mastoids	No. of cases	Take up rate	Failure rate
Small	6	4 (66.6%)	2 (34.4%)
Medium	18	14 (77.7%)	4 (22.3%)
Large	6	6 (100%)	0

Adjusted $\chi^2_{(2)} = 3.317$ p = 0.190 (Not significant)

Cortical mastoidectomy + type I tympanoplasty (Group -B)

Size of mastoids	No. of cases	Take up rate	Failure rate
Small	13	10 (76.9%)	3
Medium	15	14 (93.3%)	1
Large	2	2 (100%)	0

Adjusted $\chi^2_{(2)} = 2.167$ p = 0.338 (Not significant)

As seen from the above charts a larger mastoid gives a much better take up rate, as compared to a smaller mastoid, irrespective of whether Type I tympanoplasty was done with or without cortical mastoidectomy. However, with a cortical mastoidectomy, the take up rates were found to be better even for smaller mastoids.

Table 8. Post – Operative Clinico-Audiological Evaluation

Procedure	No. of cases	Take up rates	Failures	Freedom from discharge	Audiological benefit
Group-A	30	24 (80%)	6 (20%)	25	10.4 dB
Group-B	30	26 (86.7%)	4 (13.3%)	30	9.7 dB

$\chi^2_{(1)} = 0.480$ p = 0.488(Not significant)

Table 9. To test the significant difference between the two groups with respect to Audiological Benefit

Procedure	No. of cases	Medium	Maximum	Mean	Std. Deviation
Group-A	24	0	28	10.46	6.547
Group-B	26	0	18	9.77	5.294

$T_{(48)} = 0.41$, p = 0.685(Not significant)

In group A (type I tympanoplasty only) patients the graft take – up rates were 80% compared to 86.7% of group B (type I tympanoplasty with cortical mastoidectomy). Although there was failure of the graft to take up in 4 cases of Group B, all the patients were free from ear discharge post operatively. However in the failed cases of Group A, there was no clinical improvement in five cases and ear discharge persisted even after surgery. The audiological improvement was found to be almost equal in both Group- A and Group – B.

Table 10. Audiological Assessment

Hearing	No. of cases	Percentage
Improvement	47	78.33%
No change	12	20%
Worsened	1	1.7%
Total	60	100%

$\chi^2_{(1)} = 21.6$ p = 0.0001(Significant)

In our study of 60 cases, there was an average hearing improvement of 10.74 dB in speech frequencies in 78.3% of cases. 10 cases were not taken into account, as there was failure of graft take up. 2 cases showed no post operative audiological benefit inspite of graft take up. In one case there was deterioration from moderate conductive hearing loss to moderately severe mixed hearing loss after surgery.

CONCLUSION

Infection represents the single most important cause of graft failure and can result from a hidden mastoid disease. A simple mastoidectomy is an effective means of repneumatizing the mastoid air cell system as well as eradicating the mastoid source of infection. Our study proves that type I tympanoplasty along with a cortical mastoidectomy gives better results than type I tympanoplasty alone.

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Prevalence of ABO and Rhesus Blood Groups Among Blood Donors

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ABSTRACT

Background: ABO and Rhesus (Rh) blood group antigens are hereditary characters and are useful in population genetic studies, in resolving medico-legal issues and more importantly for the immunologic safety of blood during transfusion.

Objectives: To document the distribution pattern of the ABO and Rh blood groups among blood donors in and around Davangere (Karnataka).

Methods: The distribution of ABO and Rh blood group was analyzed among 19,413 blood donors, over a period of 5 years (2005 to 2009). The age group and sex of donors, frequency of ABO blood groups and Rh status were calculated.

Results: The predominant donors belonged to the age group between 18-35 years (86.18%). Male to female ratio among donors was 86:1. The most prevalent blood group was O (36.76%), followed by group B (29.85%) and group A (26.15%). The least common blood group was AB (7.24%). The prevalence of Rh positive and negative distribution in the studied population was 94.48 and 5.52% respectively. The highest frequency of coexisting ABO-Rh phenotypes was that of O positive (34.67%) followed by B positive (29.85%) and A positive (26.15%).

Conclusion: Knowledge of frequencies of the different blood groups is very important for blood banks and transfusion service policies that could contribute significantly to the National Health System.

Keywords: Blood groups, ABO, Rhesus, Phenotypes, Blood donors.

INTRODUCTION

Over 700 erythrocyte antigens have been reported in the literature and have been organized into 30 blood group systems by the International Society of Blood Transfusion¹. The two most significant blood group systems were discovered by Karl Landsteiner during early experiments with blood transfusion: the ABO group in 1901² and in co-operation with Alexander S Wiener the Rhesus group in 1937³. The discovery of the ABO system marked the beginning of modern blood banking and transfusion medicine. The ABO system is the single most important blood groups which hold a respectable position in view of the safety of blood/blood component transfusion to date^{4,5}.

Blood groups are genetically determined and exhibit polymorphism in different populations.⁶ The knowledge of the distribution of ABO and rhesus (Rh) blood group is essential for effective management of blood banks inventory, be it a facility of a smaller local transfusion service or a regional or national transfusion service. Apart from their importance in blood transfusion practice, ABO and Rh blood groups are useful in population genetic studies, researching population migration patterns, as well as resolving certain medico-legal issues, particularly of disputed parentage. It is, therefore, imperative to have information on the distribution of these blood groups in any population⁷.

The frequencies of ABO and Rh blood groups vary from one population to another. There are very few documented works devoted to the study blood groups in India and no data is available for Davangere, Karnataka. Our aim was to determine the ABO and Rh blood group distribution pattern among blood donors in a tertiary care hospital and to compare our results with other studies in India and elsewhere.

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MATERIALS AND METHODS

ABO and Rh blood group of 19,413 blood donors (includes both voluntary and replacement donors) who donated blood for various reasons at the S S Blood Bank, Davangere, were analyzed from the inception of blood bank in 2005 to 2009 (five years). Donors were also recruited from various blood donations camps held in association with Indian Red Cross society and district hospital Davangere. The blood group phenotypes were detected by the classic slide and tube method by the antigen-antibody agglutination test with appropriate positive and negative control by mixing whole blood with appropriate anti-sera. In case of doubt, the test was examined under a microscope or the results were confirmed by reverse grouping using known group A and B red cells. Results of donors' age, male to female ratio and frequency of ABO and Rh blood groups were analyzed.

RESULTS

A total of 19,413 blood donor's blood groupings were done. The donors were aged 18-60 years with the maximum donors between 18-35 years (86.18%)

Table 2. The frequency of combined ABO and Rh blood groups among blood donors

Blood Group	Rh positive	%	Rh negative	%	No. of Donors	Prevalence (%)
A	4778	24.61	300	1.54	5078	26.15
B	5486	28.26	309	1.59	5795	29.85
AB	1348	6.94	59	0.3	1407	7.24
O	6727	34.67	406	2.09	7133	36.76
Total	18339	94.48	1074	5.52	19413	100

Rh-D negative was common to the blood group O (2.09 % of all blood groups) as compared to blood group of AB (0.30%). The Rh group negativity for blood groups A and B were close (1.54% and 1.59% respectively). There was no association between ABO blood group and Rh status.

DISCUSSION

Both ABO and Rh blood grouping is very important for safe blood transfusion. Dangerous hemolytic transfusion reactions may occur when blood is transfused into an individual with an incompatible blood type.⁸ The severity of the resulting transfusion reaction may vary from an asymptomatic minor rise in the plasma bilirubin level to severe jaundice and renal tubular damage, with anuria and death. Another complication due to "Rh incompatibility" arises when an Rh negative mother carries an Rh positive fetus (erythroblastosis fetalis).⁵

ABO and Rh genes and phenotypes vary widely across races and geographical boundaries⁹⁻¹¹ despite the

Table 1. Male donors (19189, 98.85%) were more than females (224, 1.15%) with male to female ratio of 86:1. The number of voluntary and replacement donors were 1197 (6.17%) and 18216 (93.83%) respectively.

Table 1. Age distribution of blood donors

Age Group (Years)	No. of Donors	Percentage
18- 25	8950	46.11
26- 30	5119	26.37
31- 35	2659	13.70
36- 40	1562	8.05
41- 45	691	3.55
46- 50	336	1.73
51-55	78	0.40
56-60	18	0.09
Total	19413	100

The most common ABO blood group was found to be group O (7133, 36.76%), followed by group B (5795, 29.85%) and group A (5078, 26.15%). The least common blood group was AB group (1407, 7.24%) i.e., O > B > A > AB. Rh antigen was detected in 18,339 (94.48%) donors while Rh negative phenotype was found in 1074 (5.52%) donors (Table 2 and Figure 1).

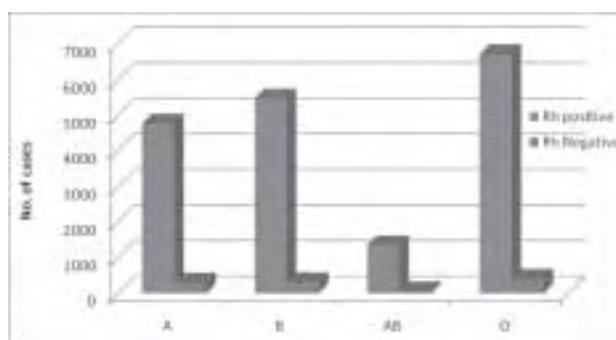


Fig. 1. Frequency of ABO and Rh phenotypes among donors.

fact that the antigens involved are stable throughout life. The resultant polymorphism remains important in population genetic studies, estimating the availability of compatible blood, evaluating the probability of hemolytic disease in the new born, resolving disputes in paternity / maternity and for forensic purposes^{4,12}.

In our study, maximum donors were between 18-35 years because young adults usually volunteer

to donate blood than older age group. It was also evident that numbers of female donors were less because of their low body weight, low hemoglobin concentration, ignorance, lack of motivation and awareness and fear among the females regarding blood donation. The similar findings were noted by Ahad et al¹³ Hence, general population needs more motivation and many voluntary blood donation camps need to be conducted to meet the increasing demand for blood. We have compared the frequency of distribution of blood groups ABO and Rh to previous studies Table 3. The present study is useful in providing information about the status of ABO and Rh blood group among blood donors which might represent ABO and Rh frequency in general population.

Table 3. Comparison of distribution of ABO and Rh blood groups in the present study and other countries. (DNA-data not available)

Study	A	B	AB	O	Rh +	Rh -
Present	26.15	29.85	7.24	36.76	94.8	5.52
Bangalore ¹⁴	23.85	29.95	6.37	39.82	94.2	5.79
Mysore ¹⁵	34.3	25.3	6	37.4	97.3	2.67
Mysore ¹⁶	26.6	28.72	12.77	31.91	96.8	3.19
Chittoor ¹⁷	18.95	25.79	7.89	47.37	90.6	8.42
Vellore ¹⁸	18.85	32.69	5.27	38.75	94.5	5.47
Gujarat ¹⁹	23.3	35.5	8.8	32.5	94.2	5.8
Punjab ²⁰	21.9	37.6	9.3	9.3	97.3	2.7
Bangladesh ¹³	24.17	34.54	8.27	33.05	97.1	2.89
Pakistan ²¹	23.8	38	10	10	89.1	10.9
Nepal ²²	34	29	4	33	96.7	3.33
Niger-Delta ⁷	23.8	20.7	2.8	52.7	93.9	6.12
Yemen ²³	29.6	16.5	2.3	2.3	92.9	7.1
Iran ²⁴	33.1	23.3	8.9	8.9	88.7	11.3
Saudi Arabia ²⁵	33.4	6	3.8	56.8	92.8	7.2
Bahrain ²⁶	21.5	24.4	4.5	4.5	94.5	4.5
Australia ²⁷	38	10	3	49	DNA	DNA
United Kingdom ²⁸	42	8	3	47	DNA	DNA
USA (Blacks/Whites) ²⁸	27/40	20/11	4/4	49/45	DNA	DNA
World's population ²⁸	32	24	7	37	DNA	DNA

As far as distribution of ABO blood group is concerned, the group O is the most frequently encountered phenotype in the population under study. This observation is in accordance with previous reports from other parts of South India^{14, 15, 18}. Another south Indian study conducted on the population of Chittoor district of Andhra Pradesh also showed similar pattern of distribution of blood groups¹⁷.

With regard to the other ABO blood group phenotypes, the frequency of group 'A' in the present

study is in proximity to the reported frequency among the Bangaloreans¹⁴. Slightly higher frequency for group A was reported in Gangadikara Vokkaligas of Mysore¹⁵.

A proportion of group 'B' as in our study is similar to report by other studies from South India^{14, 18} whereas in north India blood group 'B' was found to be commonest ABO subtype^{19, 20}. The discrepancy between our findings and that reported by Wadhwa et al¹⁹ and Sidhu²⁰ may be attributed to the ethnic difference among the population of India, or it could be due to the smaller sample size as against a relatively larger sample size in the present study. A Study done by Nanu and Thapliyal²⁹ also reports that group B is the most predominant ABO group in the north Indian population as also in neighboring Pakistan.²¹ Bombay group was not found in our study.

The frequency of Rh negative phenotype is close to those reported from other parts of South India^{14, 18} and north-India^{19, 29}. This indicates that frequency of Rh-D negative phenotype in India is around 5% in sharp contrast to the frequency of about 15% phenotype reported in other nations^{6, 11}.

CONCLUSION

This study establishes that there is a significant difference in ABO blood groups between south and north India, and India as well as different parts of the world. Among blood donors, the various ABO and Rh blood groups in south India, group O is the commonest, followed by blood groups B and A, where as in north India group B is the commonest phenotype. The frequency of Rh-negative in India is similar to other series. The results of this study could contribute significantly to the National Health System in aiding the prediction of percussions of certain diseases related to blood groups, as well as the requirement for certain blood groups within the blood donation programme. Knowledge of the frequencies of the different blood groups in this part of India is very important for blood banks and transfusion service policies. Knowledge of blood group phenotype distribution is also important for clinical studies (for example disease association), as well as for population studies.

Thinking about the life threatening complications and dangerous sequel of transfusion reaction we should be very careful regarding ABO and Rh blood grouping starting from blood collection, blood grouping and cross matching and up to transfusion to the recipient. Only sincerity and awareness can bring these dangerous transfusion reactions to zero.

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A Study of Research Pattern of Postgraduate Dissertations in Pathology

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ABSTRACT

This is a descriptive study undertaken to analyze the pathology dissertation topics of MD pathology students. 107 dissertation topics obtained through the website of RGUHS were analyzed. Skin, Female Genital System, Gastrointestinal system and Blood were the most common systems chosen for the study and maximum sample size was from Female genital system. Studies incorporating immunohistochemistry, immunofluorescence, flow cytometry, and other newer and sophisticated techniques were very rare.

Key words: Pathology dissertation, Clinicopathology, Cytology, Hematology, Histopathology.

INTRODUCTION

Research in the form of thesis / dissertation work is an integral part of most postgraduate curriculums. Exposure to research helps to train the mind in adopting a scientific approach to medical and clinical problems.

The goal of medical research is to improve health and the purpose is to learn how systems in human body work, why we get sick and how to get back to health and stay fit. Research is the basic foundation to improve medical care. It can also provide evidence for policies, decisions on health development and finds new ways to treat and prevent disease.

Pathology is a scientific study of the nature of disease and its causes, processes, development, and consequences. Pathology is a unique medical specialty, touches all branches of medicine, as diagnosis is the foundation of all patient care. In fact, more than 70 percent of all decisions about diagnosis and treatment, hospital admission, and discharge rest on medical test results. Thus Pathology serves as the bridge between the basic sciences and clinical medicine and is the scientific foundation for all of medicine¹.

There are 31 colleges teaching Post Graduate course in Pathology in Karnataka, out of which 26 colleges are affiliated to Rajiv Gandhi University of Health Sciences (RGUHS), Bangalore. This paper analyses the studies which are undertaken by Post Graduates of Pathology of various medical colleges attached to RGUHS.

107 studies have been taken for analysis, as per the RGUHS web site www.rguhs.ac.in² dissertation subject wise list on greenstone platform as on 21.12.2010. Details of 67 studies obtained are analyzed. The present study helps to know about the various studies done by the Post Graduates of pathology for their dissertation and to know thrust areas which require studies.

MATERIAL AND METHODS

This is a descriptive study undertaken to analyze the pathology dissertation topics of postgraduates of pathology doing MD, in various medical colleges attached to Rajiv Gandhi University of Health Sciences. Material for the study was obtained through the website www.rguhs.ac.in on the greenstone plot form. As on 21.12.2010, there were 107 dissertation topics uploaded in the website covering dissertations undertaken from 2005 to 2008. Out of 107 topics, proper link was obtained for 67 titles, the details of which were taken and analyzed for the type of study, sample size and the organ system to which the study was confined. There was a wrong link for 40 titles which are excluded from the study.

RESULTS

107 titles obtained initially, showed the following distribution pattern of the topics.

Histopathology 30 (28%), Cytology 12 (11.2%), Clinicopathology 9 (8.4%), Cytology / histology

correlation 3 (2.8%), Hematology 12 (11.2%), Histochemistry 1 (0.9%)

Table 1. Types of study undertaken by pathology postgraduates is as follows:

Type of study	No. of studies	%
Clinicopathological	9	8.4
Cytology	12	11.2
Cytology/Histology	3	2.8
Hematology	12	11.2
Histochemistry	1	0.9
Histopathology	30	28.0
Wrong link	40	37.38
Total	107	100

Table 2. The various systems to which the study was confined are as shown below.

System	No of studies	No of studies with wrong link	Sample Size
Blood	13	2	50-500
Bones	2	2	-
Breast	7	3	50-180
Cardiovascular system	1	-	50
Central Nervous System	1	-	62
Female Genital System	14	4	85-9945
Gastrointestinal	14	4	30-265
Gastrointestinal/Salivary gland	1	1	-
Head & Neck	2	1	197
Liver	3	2	56
Lungs/ Respiratory System	2	1	-
Lymph Node	7	2	50-244
Male Genital System	4	3	93
Mediastinum	1	-	71
Nerve	1	1	-
Nose	3	1	51
Renal System	1	1	-
Salivary Gland	1	1	-
Skin	16	6	28-198
Soft Tissue	3	2	138
Thyroid	7	2	82-162
Others	3	1	56-100
Total	107	40	

Sample size was obtained only in 67 studies to which a proper link was obtained. Overall sample size varied from 28-9945. Highest number of sample studied ie 9945 was from histopathology of female genital system. Least number of samples for the study ie 28 was from skin.

Skin, followed by gastrointestinal system, female genital system and blood were the most frequently chosen system for the study, as shown in the above Table.

DISCUSSION

Medical research and projects also have several benefits, such as improving students' ability to interpret the scientific literature critically when working as physicians or dentists, increasing the potential number of scientists who will pursue medical research and improving independent analytical problem-solving skills³.

Improving the quality of research is more a question of attitude than hard work. The amount of work required for doing mediocre research is exactly the same as that for the best of research. Research aims at the production of new knowledge and new skills that can be used in society⁴.

Both quantitative and qualitative approaches to research evaluation can be used to connect the aims of health research to its perceived value of research outcomes, whether this is tied to scientific excellence or usefulness⁵. Pathologists play an important role in patient care and management with other doctors, as a diagnostician, consultant, experimentalist, auditor of the quality of medical practice, teacher and administrator, etc⁶.

Histopathology (28%) was the commonest study chosen for the dissertation topic and the different systems which were commonly preferred for the study were Female genital system, gastrointestinal system and Skin.

Histochemistry, respiratory system, nerve, Mediastinum was the least common topics for study. Sample size was highest for female genital system, as maximum number of specimen received for histopathology to any medical college laboratories is from female genital system, of which hysterectomy, cervical biopsy and endometrial samples are the commonest.

With advances in technology, there are new and sophisticated diagnostic methods available for disease diagnosis. Because of lack of availability of such investigation in all the medical colleges and also they are not cost effective, students opt for histopathology and Clinicopathological studies for their dissertation work. Histopathology still remains the gold standard for confirmation of diagnosis and since the facility is available in all the medical colleges, students choose to take up histopathological studies. Postgraduate students should be encouraged to take up research activities, which adopt other types of investigations and skill. This calls for all the medical colleges to have sophisticated laboratory for such investigations and also trained personnel. This can happen when medical council of India mandates the establishment of

laboratory with sophisticated methods of investigations in all medical colleges.

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Site Distribution of Different Types of Cutaneous Malignancy

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ABSTRACT

Background: Dermatological malignancies are relatively uncommon. Since the investigation, at an individual level, of various aspects of lifetime sun exposure, however, remains difficult, comparison of the site distribution and age pattern of different types of skin cancer can be an important source of aetiological clues. This study sought to evaluate the site distribution and age pattern of three main types of skin cancer in our setting.

Methods: The present study is a descriptive analysis of three main skin cancers seen in a tertiary hospital in Davangere. Histologically diagnosed various skin cancers i.e. malignant melanoma (MM), basal-cell carcinoma (BCC) and squamous-cell carcinoma (SCC) from January 2005 to December 2009 were reviewed and analyzed according to age, gender and site of distribution.

Results: During the study period forty tissue samples received were histologically confirmed to be of common primary skin cancers. The ages of the patients ranged from 18 and 80 years (mean: 51.4years). Squamous cell carcinoma (SCC) was the most common malignancy consisting of 26 (65 %) cases followed by melanoma with 9 (22.5%) cases and basal cell carcinoma (BCC) with 5 (12.5%) cases. The most common incidence was among the age group 40-60 years with 20(50%) cases detected. The head and neck was the commonest site of involvement for SCC and BCC, whereas for melanoma it was lower extremities.

Conclusion: Squamous cell carcinoma, Basal cell carcinoma and malignant melanoma constitute three main histotypes of skin cancer. SCC and BCC compared to malignant melanoma affect body locations which are usually sun exposed. Age-related behavior (i.e., another indirect indicator of duration of exposure to UV light) is consistent with the anatomical distribution of skin cancer.

Key words: *Squamous cell carcinoma, Basal cell carcinoma, Malignant melanoma, Site distribution.*

INTRODUCTION

Three most frequent primary skin cancers are basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and malignant melanoma (MM). BCC and SCC, in combination are referred to as nonmelanoma skin cancers (NMSC). Exposure to ultra-violet (UV) radiation plays a major role in the aetiology of three main skin cancer types. The doses and patterns of sun exposure most strongly related to the risk of various

skin cancer types seem, however, to vary substantially.¹

While SCC is believed to rise steadily with continuous intense sun exposure, the strongest evidence for MM has been intermittent exposure. BCC has been less often studied, but some data indicate that the risk of BCC may not increase beyond a certain level of sun exposure.^{2,3} Since the investigation, at an individual level, of various aspects of lifetime sun-exposure however, remains difficult, comparison of the site distribution and age pattern of different types of skin cancer can be an important source of aetiological clues, especially if based on unselected population based series⁴.

This study sought to evaluate the site distribution and age pattern of three main types of skin cancer and an attempt was made in understanding the possible etiological clues in these malignancies.

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MATERIALS AND METHODS

The present study was done in the department of pathology, S.S. institute of Medical Sciences and Research Centre, tertiary care hospital, Davangere which caters largely to the surrounding village population. A total of 40 cases with histological diagnosis of cutaneous malignancy i.e. malignant melanoma (MM), basal-cell carcinoma (BCC) and squamous-cell carcinoma (SCC) from January 2005 to December 2009 were analyzed. Malignancies of skin adenexa and anogenital region were excluded from the study. The variables evaluated included age, gender and site distribution of three main types of skin cancer the details of which were obtained from case records.

RESULTS

During the study period forty tissue samples received were histologically confirmed to be of common primary skin cancers. Table 1 shows the relative incidence of skin cancer types. Squamous cell carcinoma (SCC) was the most common malignancy consisting of 26 (65 %) cases followed by melanoma with 9 (22.5%) cases and basal cell carcinoma (BCC) with 5 (12.5%) cases. Age of patients ranged from 18 years to 80 years with mean age of 51.4years (Table 2). 29 cases (72.5%) were males and 11 cases (27.5%) females with a male to female ratio of 1: 0.37. The most common incidence was among the age group 40-60 years with 20(50%) cases detected. Tumors were rare below the age of 30 years with only 4 cases.

Table 3 shows the Age and sex distribution of skin cancer. High Incidence of malignant melanoma was

between 41-50 yrs, basal cell carcinoma 61-70 yrs and squamous cell carcinoma 51-60 yrs. Distribution of primary sites involved is shown in Table 4. Most cases of SCC (50%) were seen in the head and neck region with majority in face including lip. Equal number of SCC (38.4%) were also seen in lower limb especially involving the foot. Melanoma occurred more on the lower extremities (66.7%) frequently involving the foot. Among the BCC, majority of the cases i.e. 80% were reported in the head and neck region with the predilection for face.

Table 1. Relative incidence of skin cancer.

Type	Number	Percentage
Squamous cell carcinoma	26	65.0
Malignant melanoma	09	22.5
Basal-cell carcinoma	05	12.5
Total	40	100

Table 2. Age/gender distribution.

Age range	Gender		Total (%)
	M	F	
01-10	0	0	0 (0)
11-20	2	0	2 (5)
21-30	1	1	2 (5)
31-40	4	2	6 (15)
41-50	7	2	9 (22.5)
51-60	9	2	11 (27.5)
61-70	4	3	7 (17.5)
71-80	2	1	3 (7.5)
Total	29(72.5)	11(27.5)	40(100)

Mean: 51.4 years; age range: 18-80 years.

Table 3. Age/sex distribution of Skin cancer.

AGE	MM		BCC		SCC		Total
	M	F	M	F	M	F	
01-10	0	0	0	0	0	0	0
10-20	1	0	0	0	1	0	2
21-30	0	0	0	0	1	1	2
31-40	0	1	0	0	4	1	6
41-50	3	1	0	0	4	1	9
51-60	1	1	1	0	7	1	11
61-70	0	0	2	2	2	1	7
71-80	1	0	0	0	1	1	3
Total	6	3	3	2	20	6	40

MM: Malignant melanoma, BCC: Basal cell carcinoma, SCC: Squamous cell carcinoma

Table 4. Site distribution of different types of skin cancer

Site Distribution	Number			Total (%)
	Malignant Melanoma	Basal-cell carcinoma	Squamous cell carcinoma	
Head & neck	1(11.1)	4(80)	13(50)	18(45)
Scalp	-	1	3	4
Ear	-	-	1	1
Face	1	3	9	13
Upper limb& shoulder	2(22.2)	-	2(7.7)	4(10)
Axilla	1	-	-	1
Arm	-	-	2	2
Hands	1	-	-	1
Lower limb	6(66.7) 17(42.5)	1(20)		10(38.4)
Thigh	-	-	2	2
Popliteal fossa	1	-	2	3
Leg	-	-	2	2
Foot	5	1	4	10
Unknown	-	-	1(3.9)	1
Total (%)	9(100)	5(100)	26(100)	40(100)

DISCUSSION

Squamous cell carcinoma, Basal cell carcinoma and malignant melanoma constitute three main histotypes of skin cancer⁴. Skin cancers occur mainly in the sixth, seventh and later decades^{12, 14-15}.

In the present series, nearly 70% of all reported cases of cancer relate to the fifth and later decades. The frequency of skin cancers in men and women is different. Present study shows male preponderance comparable to other studies¹³⁻¹⁵. Skin cancers occur mainly in the sun exposed regions predominantly involving face and neck areas of the body^{13,16}. Present study also shows that 45% of the reported skin cancer types were found in the head and neck region which demonstrate the major influence of sun exposure in the development of skin cancers.

SCC was the commonest skin cancer in the present series similar to other studies^{11,13}. SCC commonly occurs on sun damaged skin. Our results indicate that SCC compared to malignant melanoma affect body locations which are usually sun exposed, such as the face, scalp and upper arm. This corroborates previous studies by Franceschi et.al¹ and the findings are in line with continuous chronic sun exposure playing a more important role for SCC than melanoma. Present study shows predominant clustering of SCC over fifth decade and later.

Melanoma ranked the second most frequent tumor after SCC. The site distribution of melanoma does not accord with sun exposure in comparison with the non-melanoma skin tumours¹⁰. Foot was the major site of

involvement in the present study thus indicating the role of non-solar risk factor similar to other studies.¹¹ Melanoma showed clustering of cases over fourth decade. BCC was the third most common lesion in the present study contrast to other studies^{14,15}. BCC in this series predominantly involved the face comparable to other studies⁹ and showed high incidence rate over sixth decade.

In conclusion Squamous cell carcinoma, Basal cell carcinoma and malignant melanoma constitute three most frequent primary skin cancers. SCC and BCC compared to malignant melanoma affect body locations which are usually sun exposed. Age-related behavior (i.e., another indirect indicator of duration of exposure to UV light) especially for nonmelanoma skin cancer is consistent with the anatomical distribution of skin cancer.

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Comparison of Pain Response to Heel Prick and Venepuncture in Term Babies

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ABSTRACT

Objective: The objective of the study was to know the difference in the behavioural pattern that appear with painful stimuli in term neonates and also to compare the pain response to venepuncture & heel prick for blood sampling in term neonates.

Method: 70 healthy term neonates between 37 weeks to 42 weeks of gestational age, who required blood sampling for bilirubin or blood sugar estimation within the first week of life, were selected for the study. Selected cases were equally divided into 2 groups. In group 1, blood sampling was done by venepuncture and in group 2, blood sampling was done by heel prick. The state of arousal in neonates was assessed before the procedure with prechtl and beintema score. The pain following the procedure was measured in terms of behavioural pain score. Oxygen saturation, heart rate and respiratory rate were monitored by a single observer. The data collected was statistically analyzed by using Fisher's 'Z' test.

Results: 1. The behavioural pain response scores were increased in both the groups. 2. In response to painful stimuli, there was increase in heart rate and respiratory rate and decrease in oxygen saturation in both the groups. 3. The study revealed that term neonates who underwent heel prick had higher pain score than venepuncture. 4. There was no difference in pain response score between male and female babies in both the groups.

Conclusion: Pain response was more during heel prick than venepuncture. Like adults, babies do experience pain. Hence it is necessary to use analgesia during any painful procedures.

INTRODUCTION

Pain is defined by the International Association for the Study of Pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage".¹ Acute pain is a highly complex, dynamic subjective experience that is useful to growing children, serving to warn them of danger and limiting exposure to additional injury. This definition is problematic when considering neonates and infants who are incapable of self report and may not have had previous experience with injury.

Anand and Craig² propose that pain perception is an inherent quality of life that appears early in

development to serve as a signaling system for tissue damage. This signaling includes behavioural and physiological responses that are valid indicators of pain and can be inferred by others.

The pain in neonates has been historically underestimated & undertreated. It was thought that neonates do not feel pain because of inadequate myelination of sensory nerves, immaturity of pain receptors & reduced localization of pain. The effects of pain are also deleterious⁴. First pain experience has profound effects on subsequent pain perception and responses. Pain experience in the neonatal ICU may alter the normal course of development of pain expression in toddlers and pre-school children. Pain & stress in the neonatal period also alters pain sensitivity, decreases weight gain & decreases ability to learn. Extreme preterm neonates requiring many painful procedures during NICU care will have high prevalence of clinical & subclinical neurologic deficits, neurobehavioural disorders and psycho social problems during their pre-school and school years⁵.

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Behaviour is the main source of expression of pain in non-verbal neonates. It is considered that there is increased sensitivity of pain in preterm babies as pain threshold is directly related to gestational age. Preterm babies having low threshold are highly sensitive to pain and term babies having higher threshold have lesser sensitivity to pain.

The early and abundant expression of putative neurotransmitters mediating nociception together with the delayed appearance of neurotransmitters associated with descending inhibitory fibers is responsible for increased excitability in the dorsal horn of the premature spinal cord. The magnitude of hormonal, metabolic, cardiovascular and immune response to invasive procedures is high in preterm and term babies. Because of high magnitudinal response, higher plasma concentration of analgesia and anesthesia are required to produce effect in neonates as compared to older age group.

There is still uncertainty about the extent of perception of pain by preterm babies as compared to term babies. Thus there is need to define differences in the common behaviours that consistently appear with painful stimuli in term and preterm babies. There is a gap in knowledge regarding this, hence present study was undertaken.

METHOD

The present study, a prospective study was carried out in the Department in Pediatrics in a reputed medical college hospital in Karnataka, India. The ethical clearance for the study was obtained from the institutional review board. The sample size for the study was determined to be 70. Healthy term neonates between 37 weeks to 42 weeks of gestational age, who required blood sampling for bilirubin or blood sugar estimation within the first week of life, were selected for the study. Selected cases were equally divided into 2 groups. In group 1, blood sampling was done by venepuncture and group 2; blood sampling was done by heel prick. Babies with significant morbidity like Septicemia, Birth Asphyxia, Congenital Malformation, neurological involvement and those received Nalaxone were excluded from the study.

Mothers of the selected neonates were always present during blood samplings & informed consent was taken before the procedure.

The state of arousal of neonates was assessed before the procedure using Prechtl and Beintema score as:

1. Eyes closed, regular respiration, no movements.
2. Eyes closed irregular respiration.
3. Eyes open, no gross movements

4. Eyes open, continual gross movements, no crying
5. Eyes open or closed, fussing or crying

Neonates in state 5 were not included in the study. The Dorsum of the hand was selected and venepuncture was done using a 24 gauge hypodermic needle. A cotton wool ball was applied to prevent bleeding. For the heel prick group, the heel was wiped with alcohol and pricked with a lancet to collect blood. A cotton wool ball was applied to prevent bleeding.

The pain during the procedure was scored in terms of behavioral pain score as

1. Brow Bulge
2. Eye Squeeze
3. Nasolabial Furrow
4. Open mouth
5. Cry

Each response was given a score of 1 if present and '0' if absent. Total score ranging from 0 to 5 were possible. Oxygen saturation was monitored using pulse oximeter. Heart rate, respiratory rate and behavioural scores were monitored by single observer.

Heart rate, respiratory rate and saturation were measured before and after the procedure. The maximum response during first five minutes of procedure was taken into consideration and the results were compared between groups I and II. The data collected was analyzed for statistical significance by student t test for continuous numerical values and the results were expressed in frequency, percentages, mean and SD. $P < 0.05$ was considered as significant.

RESULTS

In present study 70 term neonates were selected, to know the difference in the behavioural pattern that appear with painful stimuli and also to compare the pain response to venepuncture & heel prick. Among selected neonates, 42 were males and 28 were females. (Table 1)

Table 1. Gender distribution

Group	Male	Female
Group I: Term Venepuncture	21	14
Group II: Term Heel prick	21	14

Most of the babies selected were having a score of 3 in Prechtl & Beintema score. In this study almost all neonates exhibited brow bulge & eyes squeeze during the procedure. Nasolabial furrow & open mouth were next commonly observed response. Cry as a response was consistently high in heel prick group when compared to venepuncture group. (Table2)

Table 2. Behavioural pain score

Facial actions	Term Venepuncture	Term Heel prick
Brow bulge	35	35
Eyes squeeze	34	35
Nasolabial furrow	31	35
Open mouth	25	33
Cry	18	29

There was significant difference in behavioral pain response score ($p < 0.002$) between venepuncture and heel prick group. The mean behavioural pain response score for venepuncture being 4.086 & for the heel prick 4.723, which suggest that response was high in heel prick. (Table 3a, 3b)

Table 3a. Behavioral pain score

Behavioural Pain score	Number of babies	
	Term Venepuncture	Term Heel prick
2	4	-
3	7	2
4	6	5
5	18	28

Table 3b. Mean total behavioural pain score

Groups	Mean B.P.S.
I	4.086
II	4.743

Table 4. Changes in heart rate, respiratory rate & Sp_o₂ in response to venepuncture in term neonates

Variables	Before	During 1 st 5 min of procedure	Mean difference	95% CI for mean	P value
HR	127.71±15.038	149.26±17.68	+21.543	17.25+25.836	.000
RR	47.54±8.41	60.06±15.05	+12.114	8.19+16.04	.000
Sp _o ₂	95.8±2.08	91.2±2.99	-4.6	-5.63-3.56	.000

Table 5. Changes in heart rate, respiratory rate & Sp_o₂ in response to heel prick in term babies

Variables	Before	During 1 st 5 min of procedure	Mean difference	95% CI for mean	P value
HR	130.37±12.21	147.943±11.36	+17.57	14.31 to+20.83	.000
RR	45.94±10.38	59.57±9.3	+13.63	10.49 to+16.77	.000
Sp _o ₂	96.37±1.85	90.6±2.56	-5.77	-6.58 to-4.96	.000

Table 6. Comparison of pain response in term neonates for venepuncture & heel prick

	Variables	Group I (term venepuncture)	Group II (Term heel prick)	p value
Before	HR	127.71	130.37	.42
	RR	47.94	45.94	.379
	Sp _o ₂	95.8	96.37	.229
During 1 st 5 min.	HR	149.25	147.94	.713
	RR	60.057	59.57	.872
	Sp _o ₂	91.2	90.6	.371

In this study, venepuncture and heel prick groups exhibited increase in mean heart rate, respiratory rate during the first five minutes of procedure resulting in significant statistical differences ($P < 0.01$). The O₂ Saturation fell significantly during the procedure ($P < 0.01$) (Table 4 & 5)

When pain response to venepuncture and heel prick compared, there were no statistically significant differences in heart rate, respiratory rate & Sp_o₂ changes before & during first five minutes of procedure. The behavioural pain response score was statistically significant in heel prick group (Table 6).

There was no statistical significant difference in the male & female preterm infants in behavioural response score. (Table 7)

DISCUSSION

Until recently, it was believed that neonates & infants do not feel pain due to immaturity of their nervous system.

Previous studies have clearly shown that the anatomical, physiological & neurochemical structures which convey pain are well developed in both preterm & term neonates²⁰. Most of the term & preterm neonates admitted to NICU undergo repeated multiple diagnostic & therapeutic procedures that result in pain & discomfort.

Table 6a. Comparison of pain response in term neonates for venepuncture & heel prick

	Group I (TV)	Group II (TH)	p value
State of arousal score	3.057	3.086	.82
Behavioural response score	4.086	4.723	.002*

* Highly significant.

Frequent & prolonged pain may be potentially harmful to the developing nervous system & may threaten the physiological stability of premature & sick infant.^{4,6}

Table 7. Comparison pain response between Male & Female term neonates (Venepuncture and heel prick group)

Variable	Male	Female	T	P value
State of arousal	3.048± .6228	3.11± .315	.467	.642
Behavioural response score	4.476±.92	4.32±.94	.683	.492

In our study, brow bulge & eyes squeeze were most often seen facial action (97-100%). Open mouth was seen in 82% of term babies & cry in 67%.

When comparing the physiological parameter in response to pain, Harmesh Singh et al⁸, in their study reported that mean heart rate was increased during the procedure in both the groups with statistically significant differences (p<0.01). There was significant rise in respiratory rate during the procedure as compared to baseline (P<0.01). All newborn experienced a significant decrease in oxygen saturation during procedure (p<0.01).

Neil MC In tosh et al⁹ studies concluded that mean heart rate & respiratory rate increased significantly

Venepuncture & heel prick are the common methods of collecting blood in neonates. The present study clearly indicates that all newborns responded to painful stimuli in one or the other way. Various studies also reported that neonates have characteristic & predictable response to painful stimuli.

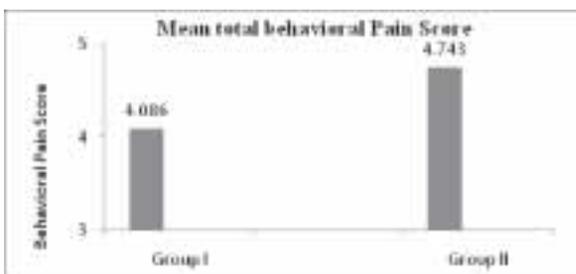
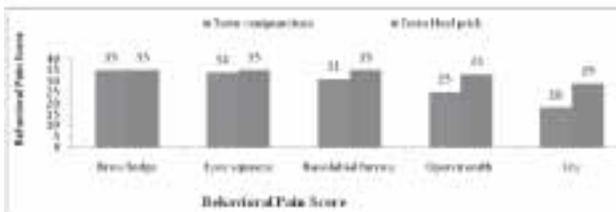
J. Alison Rush forth et al⁷ study reported that 90% of term and 84% of preterm babies exhibited an increase in behavioural response to heel prick. In term babies the brow bulge & nasolabial furrow were seen most often (83%). Eyes squeeze was observed in 78% of babies where as open mouth and cry were seen in 75% of term babies.

with pain. In our study, it was observed that heart rate & respiratory rate increased significantly in both the groups following venepuncture and heel prick procedures (p<0.001) & on the other hand oxygen saturation was decreased significantly (p<0.001). Similar responses were also seen in studies done by Brown. L. et al¹⁰, Owen ME et al¹¹, Berg.K. M. et al¹², Lindli V.et al¹³, Gonsalves S. et al¹⁴.

In a study conducted by Vibhuti S Shah,¹⁵ neonatal pain response and its adverse effects and maternal anxiety were assessed in 27 neonates using neonatal infants Pain scale [NIPS]. It was concluded that NIPS scores were higher in heel stick group compared to venepuncture group. This suggests that venepuncture is less painful than heel prick in newborns.

In our study, there was significant difference in behavioral pain response score (p<0.002) between venepuncture and heel prick group. The mean behavioural pain response score for venepuncture being 4.086 & for heel prick 4.743, which suggest that response was high in heel prick. Changes in physiological parameters i.e. heart rate, respiratory rate & oxygen saturation were uniformly present in both the groups. This implies pain response to heel prick was high compared to venepuncture.

Greisburg R et al¹⁶ & Grunau et al¹⁷, in their study concluded that female newborn babies of all gestational age expressed more facial features of pain than male babies. J. Alison Rush forth et al⁷ study concluded that term female babies were associated with increased pain scores compared to male babies. In contrast to above studies, there was no statistical



significance in behavioral response scores in male & female term babies in our study.

In Summary, the behavioural response score was increased in both the groups. In response to pain, there was increase in heart rate and respiratory rate, where as oxygen saturation was decreased in both the groups. The study revealed that term neonates who underwent heel prick had higher pain score than venepuncture. There was no difference in pain response score in male or female babies in both the groups.

CONCLUSION

Pain response was more during heel prick than venepuncture. Like adults, babies do experience pain. Hence it is necessary to use analgesia during any painful procedures.

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A Clinical and Histopathological Study of Efficacy of Chlorhexidine on Gingival Healing

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ABSTRACT

Background: The burden of rubella infection in most of the developing countries especially in Africa is not well documented because of limited epidemiological studies. Congenital rubella syndrome (CRS) in the newborn is one of the important complications of rubella infection. Many countries have introduced MMR (measles, mumps and rubella) vaccine to control CRS. Measles has been successfully controlled in many countries by vaccination centered measles control program. However, most of the African countries have not included MMR vaccine in their national immunization program.

Objective: The exact magnitude of Rubella cases in this geographic area is not known.

The availability of an effective vaccine to prevent Rubella infection and therefore CRS, has made it necessary to evaluate the burden of disease in a country where MMR vaccine is not covered in the immunization schedule or in vaccination strategy. A retrospective study was undertaken to find out the seroprevalence of rubella infection in Eritrea.

Material and Methods: This study was done in the Immunoserology section of National Health Laboratory of Eritrea which is also National Reference Laboratory. The results of earlier years were collected from the National Measles reference Laboratory and this data is primary and reliable. Rubella specific IgM kit was used using Dade-Behring, Germany ELISA kit . Specimen collection, handling, transport and processing were done as per the instructions given by the manufacturer.

Results: The seroprevalence of rubella cases (69) were high in the year 2006, when compared to other years. Like in most of the studies, the distribution of Rubella cases was maximum in children of below 14 years. Seasonal distribution of the rubella cases shows, 96% were recorded in January to May 2006 with highest number occurring in the month of April.

Conclusion: The results analysis indicate the prevalence of Rubella virus in this geographic area and in the absence of MMR vaccine in the immunization schedule there is every possibility of acquiring Rubella infection during pregnancy and therefore CRS.

Key words: Rubella, Seroprevalence, Congenital rubella syndrome

INTRODUCTION

In viral disease control measures, killer diseases of children that are preventable by vaccination are given top priority. These include diseases like Polio, Hepatitis, Measles, and Rubella. Rubella has a worldwide distribution. Before the introduction of

vaccination, outbreaks tend to occur in spring and summer. Children of 3-10 yrs are most frequently affected. Rubella is generally mild childhood viral disease. The disease is of very important public health problem because infection acquired during early pregnancy often results in number of fetal malformations called as Congenital Rubella Syndrome (CRS). Despite the vaccination program 5-10% of women of child bearing age are susceptible to rubella infection. Many nations have not introduced MMR vaccination and as a result, protection against Rubella is not provided to children. Thus making children vulnerable for Rubella infection¹. Congenital rubella is a major global cause of preventable hearing

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impairment, blindness and intellectual disability. The incidence rate of CRS is estimated to be 0.5 to 2.2 per 1000 live births in developing countries. Only 28% of developing countries vaccinate against Rubella². In countries where vaccination is uncommon, the incidence of rubella infection is high and epidemics are frequent. Serology is the mainstay of diagnosis of rubella infection. A reliable method of diagnosing rubella infection in a laboratory is by detection of rubella-specific IgM antibodies.

Rubella has been a special concern of ophthalmologists for more than 60 years. In 1941, Greg reported cataracts in 78 infants, many of whom were also affected by congenital heart disease and failure to thrive. Subsequent studies confirmed that the risk of rubella defects was high in infants whose mothers were infected by rubella virus in the first 16 weeks of pregnancy³. WHO estimates that, worldwide, more than 100000 children are born with CRS each year, most of them in developing countries⁴.

Eritrea is situated in the horn of Africa with an area of 122,000 sq.kms, with a population of ~3.5 million. To the east, the country is bordered by the Red Sea, Djibouti borders in the South-East, Ethiopia in the South, the Sudan in the North & West. As per demographic & Health Survey, 2002, published by the National Statistics and Evaluation Office, Asmara, Eritrea, May 2003, the infant mortality rate is 48 and 93 per thousand live births.

Like any part of the world, Rubella cases are reported in Eritrea. In Integrated Disease Surveillance and Response Program, which was adopted in 1998 and implemented in 2001, Measles is one of the priority diseases. Rubella is not included in the priority diseases. A Measles Reference Laboratory, aided by WHO was established within National Reference Health Laboratory, in the year 2002. In Eritrea, Surveillance on the prevalence of Rubella by immunoserological studies, guides ministry of health in intervention measure. When referred to data available on measles and rubella, it appeared that measles cases are on down trend and rubella cases on up trend. The actual burden of rubella infection in most of the developing countries especially in Africa is not well documented. The availability of an effective vaccine to prevent Rubella infection and therefore CRS, has made it necessary to evaluate the burden of disease in a country where MMR vaccine is not covered in the immunization schedule or in vaccination strategy. This prompted us to take up this research study to find out the reality of rubella cases in Eritrea by taking immunoserological prevalence as a parameter.

MATERIAL & METHODS

This study was done as part of senior research paper of second author in the Immunoserology section of National Health Laboratory of Eritrea which is also National Reference Laboratory. The Measles Reference laboratory is located within National Health Laboratory and conducts tests for Measles and rubella suspected cases. The results of the other years were collected from the National Measles reference Laboratory and this data is primary and reliable. In brief, 5 ml of Blood specimen from each suspected patient was collected and serum was separated using biocentrifuge. Rubella specific IgM kit was used using Dade-Behring, Germany ELISA kit. Elisa test was done using standard protocol given by the manufacturer. Specimen collection, handling, transport and processing were done as per the instructions given by the manufacturer.

RESULTS

The number of suspected rubella cases ranged from 43 to 112 per year over the years 2002 to 2007 (Table 1 & Figure 1). The maximum number was in the year 2006. Of the 112 cases, 69 were laboratory confirmed rubella cases. However, trend was different in the year 2007, where the number of cases were 4. For the last 6 years, maximum of 69 cases were detected in 2006. These are confirmed cases of Rubella and usually referred to Measles Reference Laboratory for the detection of measles. Thus, clinical cases which were not referred to the reference center are likely to be high.

Table: 1 Number of cases of Rubella - year wise

Year	Positive	Negative	Total
2002	18	37	55
2003	4	59	63
2004	1	33	34
2005	15	72	87
2006	69	43	112
2007	4	39	43
	111	283	394

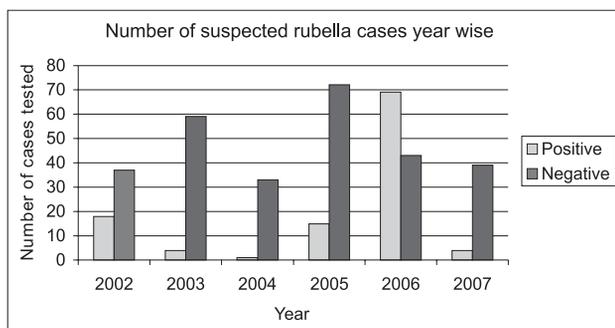


Fig. 1. Rubella cases - Year wise

In the year, 2006, a total of 127 suspected measles cases were investigated by immunoserology section and found 3 confirmed cases of measles by ELISA IgM specific for measles. On the other hand, of the 128 cases; 69 cases were confirmed by immunoserology laboratory as rubella. From the year 2006 data, it is evident that there is widespread presence of rubella in the community. 60 of the 65 cases were of below 14 years age group (Table 2 & Fig.2). Seasonal distribution of the rubella cases shows, 96% were recorded in January to May 2006 with highest number occurring in the month of April (Table 3 & Fig 3). The number of measles cases was 11,16, and 3 for the years 2004, 2005 and 2006, respectively.

Table 2. Rubella Cases – Age wise (Year 2006)

Age Group	Positive	Negative	Total
Less than 9 months	1	3	4
9 to <12 months	0	3	3
24 to < 60 months	10	7	17
5 to <14 years	49	21	70
14 years and above	5	3	8
Missing	4	6	10
Total	69	43	112

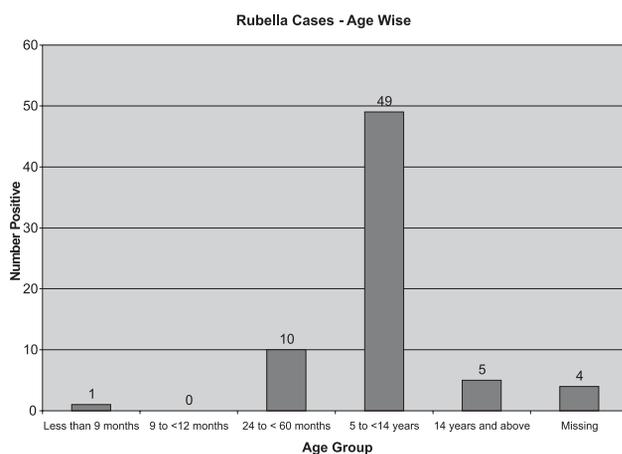
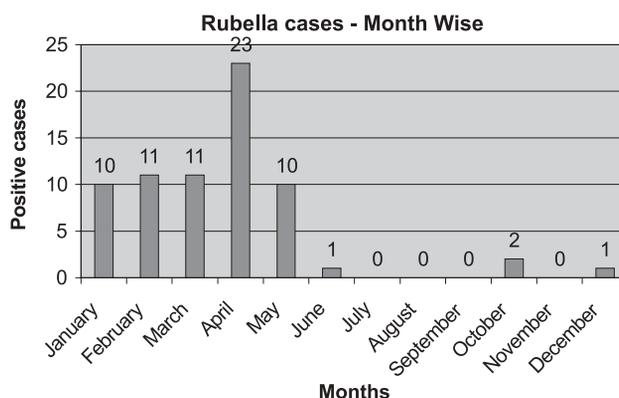


Table 3. Rubella cases - Month wise (Year 2006)

Month	Positive	Negative	Total
January	10	6	16
February	11	9	20
March	11	5	16
April	23	6	29
May	10	4	14
June	1	2	3
July	0	1	1
August	0	1	1
September	0	1	1
October	2	4	6
November	0	2	2
December	1	2	3
Total	69	43	112



DISCUSSION

Like in most of the studies^{4,5,6} the distribution of Rubella cases was maximum in children of below 14 years. Most of the cases recorded were in the months of January, February, March, April and May. It is difficult to draw any conclusion about seasonal distribution, just based on one year data. However, in many studies^{7,8} most of the rubella cases were recorded in winter. In the present study most of the cases were recorded in January to May period. In one of the studies involving screening 2300 cases for rubella infection, no seasonal pattern was observed⁹.

In a unvaccinated case low seroprevalences and late encounter of mumps and rubella was observed¹⁰. In another study, CMV infection was prevalent in a significantly higher number of children with hepatosplen-omegaly than rubella while in infants with congenital malformations a significantly higher number had rubella infection. It is concluded that rubella and CMV infections are commonly seen in children with intrauterine infections¹¹. In a study, involving 917 women and 99 newborn babies who were jaundiced, or who died within a few days of birth or who showed gross congenital abnormalities, IgM antibodies to cytomegalovirus (CMV), Herpes simplex virus type 2 (HSV-2) and rubella virus were detected indicating the importance of this virus in intra-uterine infection¹². Congenital rubella syndrome (CRS) and congenitally infected babies were born from 12 high-risk mothers in Japan and authors strongly advocated more intensive immunization to eradicate CRS completely in Japan⁷. An outbreak of Rubella was recorded in Brazil and an attempt was made to prevent by vaccination⁸.

The epidemiology of rubella and CRS has changed significantly in the last decade. These changes and molecular typing suggest that the United States is on the verge of elimination of the disease. This is mainly achieved by vaccination program. During the 1990s,

the incidence of rubella in children younger than 15 years decreased (0.63 vs 0.06 per 100 000 in 1990 vs 1999), whereas the incidence in adults aged 15 to 44 years increased (0.13 vs 0.24 per 100 000). 23 CRS infants were born to foreign-born mothers. The findings indicate sustained low incidence of rubella and CRS since 1992^{13,14}. Rubella vaccine has emerged as the most effective public health measure against the well known crippling consequences of congenital rubella infection (CRI). After the devastating pandemic of rubella between 1962 and 1965, United States licensed the use of vaccine in 1969, which resulted in 99% reduction of cases¹⁵. In 1996, the Immunization Working Group of the Mexico-United States Binominal Commission was established to enhance coordination of disease surveillance, assure high vaccination coverage in both countries, and hasten the elimination of vaccine-preventable diseases. The United States and Mexico share the Pan American Health Organization (PAHO) goal of measles elimination by 2000¹⁶.

No country in sub-saharan Africa vaccinate against rubella. It is recommended that countries wishing to undertake prevention program for CRS should either mount vaccination programs for adolescent girls or women of reproductive age or offer universal vaccination in infancy as part of routine childhood immunizations, accompanied by serological surveillance of women of reproductive age¹⁷. In this laboratory of Eritrea, the number Rubella cases detected in 2006 was 69 and measles 3. At outset, it appears that the number of Rubella cases is on the rise, while the number of measles cases is on decline. The cases were referred as suspected measles cases which were also tested for rubella antibodies to detect rubella infection. Therefore it is likely that the actual number of rubella cases in the community could be higher than actual numbers reported. This indicates the vaccine against measles is effective. Many studies^{18,19,20,21, 22} conducted recently in different countries around the globe, emphasize the need for a continued strong public health commitment to increase the proportion of vaccinated individuals and with priority to immunize women of child bearing age.

CONCLUSION

Introduction of Measles vaccine and control program successfully controlled the cases of Measles in Eritrea but not Rubella. Many countries have adapted MMR vaccine (Mumps, Measles, and Rubella) and successfully controlled Rubella cases. Rubella causes periodic outbreaks. In Eritrea, effective Measles control program by vaccination resulted in decrease in number of measles cases in children. Results of this study strongly advocate the introduction of MMR vaccine and effective surveillance of Rubella cases. The

presence of Measles Reference Laboratory which also screens specimens for rubella makes surveillance and detection effective. Although exact picture of Rubella cases in community and incidence of CRS in infants is not known, all these cases can be prevented by effective vaccination.

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Dentigerous cyst - A case report

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ABSTRACT

Dentigerous cysts are most common cystic lesions of jaws. It is most prevalent odontogenic cyst associated with an erupted or developing tooth, particularly mandibular 3rd molar. Other teeth that are commonly affected are maxillary canine, maxillary 3rd molars, canines and central incisors. Radiologically cyst appears as ovoid well demarcated unilocular, radiolucency with a sclerotic border. In the present case dentigerous cyst involving unerupted left mandibular canine tooth. Clinical and radiographical findings suggestive of dentigerous cyst which is confirmed by histopathological examination. Careful evaluations of history clinical and radiological findings help the clinician for accurate diagnosis and appropriate treatment.

Key words: Unerrupted canine tooth, Dentigerous cyst.

INTRODUCTION

Dentigerous cysts are most common developmental odontogenic cysts of jaws approximately account for 20 to 24% which apparently develops by accumulation of fluid between reduced enamel epithelium and tooth crown of an erupted tooth⁶. Dentigerous cyst or follicular cyst is an odontogenic cyst thought to be of developmental origin associated with the crown of an unerupted or partially erupted tooth. The cyst cavity lined by epithelial cells derived from reduced enamel epithelium of tooth forming organ. In addition to developmental origin some authors have suggested that periapical inflammation of non vital deciduous teeth in proximity of follicle of unerupted permanent successors may be a factor triggering this type of cyst formation⁴. Histologically a normal dental follicle lined by anomalous epithelium where as dentigerous cyst lined by non keratinized stratified Squamous epithelium. Since dentigerous cyst develops from follicular epithelium it has more potential for growth differentiation than radicular cyst. About 90% of

dentigerous cysts involved with permanent dentition. Only 5% associated with supernumerary teeth¹.

CASE REPORT

A female patient aged 18 years presented with left mandibular swelling of 2x3 cm size of ten month duration. History of gradual enlargement, swelling was bony hard in consistency and fixed to left mandible below lower lip. Radiological examination showed large circular well defined and unilocular radiolucent area surrounding unerupted permanent left mandibular canine tooth. Histopathological examination showed cystic lumen with loosely arranged fibrous connective tissue cyst wall lined by 3 to 4 layers of cuboidal epithelial cells resembling reduced anomalous epithelium. There was no inflammatory cell infiltration. After correlating the clinical, radiological and histopathological features a final diagnosis of dentigerous cyst was made.

DISCUSSION

Dentigerous simply means containing teeth. Dentigerous cyst is most common intra bony lesion of jaws in children⁴. These cysts are more commonly seen with mandibular third molar and maxillary canine and followed by mandibular premolars, maxillary third molar, supernumerary teeth and rarely the central incisor⁶. No tooth is spared, but deciduous teeth are scarcely ever affected. In our case left permanent mandibular canine is effected which is a rare

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presentation. Dentigerous cyst is a benign odontogenic cyst. These are second most common cysts after radicular cysts¹. Very rarely both cysts may be seen on the same patient. Males are more commonly affected than females⁶. Two types of dentigerous cysts occur. The first is developmental in origin and occurs in mature teeth usually as a result of impaction. These cysts usually occur in the late second and third decades, and predominantly involve mandibular third molars. The second type is inflammatory in origin and occurs in immature teeth as a result of inflammation from a nonvital deciduous tooth follicle. These are diagnosed in the first and early part of the second decade. It may occur at any age, our patient is 18 years female. Frequency in the general population has been estimated at 1.44 cysts for every 100 unerupted teeth³. Dentigerous cyst arises from alterations of reduced enamel epithelium after development of enamel resulting in accumulation of fluid between the unerupted tooth and the surrounding dental follicle is the accepted etiology. What precipitates this fluid accumulation is unknown. Sizes of the cysts are variable. These cysts are often asymptomatic therefore these lesions are diagnosed in routine radio graphical examination. Swelling, rarely pain occurs late or with infection. Multiple dentigerous cysts have been reported with associated syndromes like cleidocranial dysplasia, mucopolysaccharoidosis and basal cell nevus syndrome⁵. Radiographically, a dentigerous cyst should always be differentiated from a normal dental



Fig.2: Histopathological picture of Dentigerous cyst [H&E X400].

follicle. So these cysts cannot be diagnosed using radiographic evidence alone but must be based on both macroscopic and microscopic examination. Unicystic amyloblastoma and odontogenic kercocyst also mimic dentigerous cyst radiologically⁴. Dentigerous cyst should be differentiated from other lesions like adenomatoid odontogenic tumour, odontogenic kercocyst, amyloblastic fibroma, unicystic amyloblastoma, odontogenic adenomatoid tumour & large apical cyst⁶. Histopathological examination shows cystic lumen with loosely arranged fibrous connective tissue cyst wall lined by 3 to 4 layers of cuboidal epithelial cells resembling reduced anomalous epithelium. Hyperplastic stratified squamous epithelial lining usually seen in older patients. Secondary changes like chronic inflammation, ulceration, reactive hyperplasia, metaplsia and dysplasia may be seen. Complications associated with dentigerous cyst include pathologic bone fractures, loss of permanent tooth, bone deformation, development of Squamous cell carcinoma, mucoepidermoid carcinoma and amyloblastoma⁶. Treatment depends on size, location, disfigurement and requires variable bone removal to ensure total removal of the cyst². Surgical removal of cyst avoiding damage to the permanent tooth and enucleation of cyst along with removal of involved tooth. Recurrence very unusual. Dentigerous cyst associated with anterior teeth will result in failure of eruption and leads to esthetic and orthodontic problems.

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Fig.1: Radiographic picture of Dentigerous cyst

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Implant Considerations in Children and Adolescent Patients

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ABSTRACT

There are some congenital disorders which can lead to absence of teeth in children. Such children require replacement of teeth for functional and psychological reasons. As the growth of the jaws is still incomplete, it was generally accepted that removable partial denture is the treatment of choice in children.

Various authors have debated the pros and cons of placing implants in children and adolescent patients. All are of the opinion that an understanding of dental development and cranio facial growth is a must for anyone trying implants in children. Hence, an understanding of the direction of growth of the jaws, the problems of placing implants and the importance of vigilant recare programme in children is a necessity before attempting implants in children.

Key words: Growth, Implants, Children, Adolescence, Implant supported prosthesis,

INTRODUCTION

The reasons for missing teeth in children's include congenital disorders, pathology, trauma and others. Prosthodontic rehabilitation is required in such children depending on the individual status of the existing dentition, the functional status of mastication, phonetics, esthetic aspects and psychological well being. The replacement of missing teeth in children differs from that of adults and there are some important factors to be considered in treatment planning.

THE FACTORS INCLUDE

Growth: Jaw growth in children is continuous till 18 to 22 years and the presence of teeth is vital for the development of anatomy and physiology in the adjacent structures. Any interim prosthesis should not interfere with the growth of these structures.

Space management: There is a need for space management to facilitate proper eruption of permanent teeth. The clasps and the temporary denture base should not interfere with the eruption of natural teeth.

Neuromuscular skills: The neuromuscular skills in child are not as developed as that of adult. The better the neuromuscular coordination, the better is the adaptation to the temporary denture.

Patient and parent management: The child patient must understand the need for the prosthetic replacement; its maintenance and the importance of good oral hygiene. The child's cooperation needs to be gained through behavioral management. The parents' attitude, motivation and understanding of the proposed treatment and its limitations need to be carefully evaluated before any treatment is rendered.

Modification in the procedures: The modification of existing teeth for their preservation and maximum support, alteration of the techniques in fabrication of prosthesis and the modification and/or replacement of the prostheses is to be kept in mind during child rehabilitation.

Numerous treatment options for edentulous space in children and adolescence include; removable prostheses and recently the dental implants.

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Removable prosthesis which includes removable partial dentures, complete dentures and overdentures are often the treatment of choice to replace missing teeth and/or restore vertical dimension of occlusion prior to definitive treatment. The advantages of overdentures in cases of hypodontia are well documented. Removable prostheses are easily modified or remade during the growth period offering an easy, affordable, and reversible method of dental rehabilitation. Fixed Prosthodontic treatment is seldom used even as an interim prosthesis in the treatment of hypodontia. Fixed partial dentures with rigid connectors should be avoided in young, actively growing patients as it may interfere with jaw growth.

The successful use of implants in adults has aroused the interest of the clinicians to try them in younger patients. There is no doubt that the children who have congenital anomalies can benefit remarkably from an implant supported oral rehabilitation carried out in childhood.¹ However, dental and skeletal growth is a major compounding variable related to the use of dental implants in adolescent patients.² Clinicians should have an understanding of the potential risks involved in placing implants in jaws that are still growing and developing and consider the effect that implants have on craniofacial growth³.

For a stable implant position, it is generally recommended to wait for the completion of dental and skeletal growth. In a growing child, the growth and development of maxilla and mandible are different as are those in the specific areas of each arch^{4,7}. Transversal skeletal or alveolar dental changes are less dramatic in mandible than maxilla⁸. However if implants are to be placed in children or adolescents, the two primary concerns are the effect of growth on the long term relative position of the implant and the effect of implant supported prosthesis on future dental and skeletal growth².

Normally the early growth in maxilla is due to growth of the cranial base and the later growth is extremely variable and can be vertical, transverse and antero posterior. Transverse growth occurs at the midpalatal suture and implant prosthesis crossing the suture will restrict growth. In the mandible, the growth in the posterior region occurs predominantly in late childhood with large amounts of anteroposterior, transverse and vertical growth apart from rotational growth [Downward and forward, mediated by oppositional condylar growth]. Where as in anterior mandible, there is minimal alveolar growth when teeth are missing due to early stabilization of the mandibular symphysis. Major transverse growth is complete in early childhood. It is the most suitable site for implant placement. Placing implants in this region also will diminish the residual alveolar resorption.

In the absence of maxillary teeth, the alveolar ridges will not develop, and the maxilla will be underdeveloped both sagittally and vertically. In contrast, Mandibular growth is not dependent on the presence of teeth. Therefore, in the presence of hypodontia or anodontia, the relationship between the two jaws will tend to be disproportionate with class III development as growth continues throughout the normal growth period⁹.

DISCUSSION

Anodontia is a genetic disorder defined as the absence of all teeth and is extremely rarely encountered in a pure form without being part of a syndrome. Rare but more common than anodontia are hypodontia and oligodontia. Hypodontia is genetic in origin and usually involves the absence of 1 to 6 teeth. Oligodontia is genetic as well and is the term most commonly used to describe conditions in which more than six teeth are missing. These conditions may involve the primary or permanent sets of teeth, but most cases involve the permanent teeth.

One of the commonest causes of congenitally missing teeth in children reported in the literature is due to ectodermal dysplasia (ED). Young children with ED and anodontia in the mandible, present special challenges while placing implants.¹⁰ Implant survival rates vary between 88.5% and 97.6% in patients with ED and between 90% and 100% in patients with tooth agenesis. Implants placed in adolescent ED patients do not have a significant effect on craniofacial growth, while implants placed in ED patients younger than 18 years have a higher risk of failure¹¹. The main risk factors could be the small jaw size, the pre-operative condition, lack of patient monitoring following surgery and orofacial motor dysfunction, rather than the ED itself.^{10,11} Some of the authors have argued that endosseous implants can be successfully placed and can provide support for prosthetic restoration in patients with ectodermal dysplasia¹². Studies have shown that these patients benefit remarkably from an implant supported oral rehabilitation¹³ particularly because children do not use removable partial dentures. The loaded implants help to ensure maintenance of ridge height, prevent supra eruption, and maintain stable occlusion.

Although the development of techniques for osseointegrated implants offer new possibilities for the prosthodontic rehabilitation of such children, it was concluded that implant surgery in small children must not be considered routine treatment¹⁴. It is recommended to wait for the completion of dental and skeletal growth except for severe cases of ectodermal dysplasia¹⁵. It is accepted by most of the authors that

the safest time to place implant in such children seems to be during the decline of adolescent growth curve determined by cephalometric radiographs, serial measure of stature or hand-wrist radiograph⁸.

PROBLEMS AND PRECAUTIONS

Implants in the maxilla can behave like ankylosed tooth¹⁶, cannot participate in growth resulting in growth disturbances, unpredictable implant dislocations in vertical and antero posterior direction and even implant losses due to resorptive aspects of growth at the nasal floor and anterior surface of maxilla. It is concluded that insertion of implant in growing maxilla should be avoided until early adulthood⁸.

In the posterior mandible, implants may become submerged resulting in both functional and esthetic disadvantages later like infra occlusion and multidimensional dislocation when compared with the developing teeth. As a result there are no reported implant insertions in the posterior mandible⁸.

Overall, implants in any region can interfere with the position and eruption of adjacent tooth germs. There may be morphological changes due to trauma to tooth germs and disorders of eruption. Osseointegration may be lost as the growth takes place. In order to avoid these problems, some clinicians have tried placing implants buccally with success. Implants placed after 15 years in girls and 18 years in boys or when two annual cephalograms show no change in the position of the adjacent teeth and alveolus are said to have the most predictable prognosis^{6,9}.

If a decision is made of implant placement, it is advisable to restore larger edentulous areas with implants than to place a single implant supported crown^{1,16,17}. Considering the anatomical and morphological features in pediatric patients mini and micro implants are being introduced⁸. A combination of well executed Implant-supported/tooth-supported, overdenture (hybrid) prosthesis would be an excellent choice in rehabilitation of congenital subtotal anodontia later in life in contemporary dental practice¹⁸.

However, the decision for implant placement is based not only on growth, but also the number and location of the missing teeth. In patients who present with complete anodontia, implants can be planned in the maxilla and anterior mandible as early as age 7. These may be classified under provisional implants. It has to be kept in mind that surgery [segmental osteotomy or distraction osteogenesis] may be necessary once growth is complete to reposition of

the implant segment to a more favorable position there by to correct the jaw size discrepancy. Implants may have to be replaced⁷ or the implant prosthesis may have to be modified or remade over time by utilizing pinc porcelain or acrylic resins for fixed or removable implant supported prosthesis⁹.

Some studies have shown excellent long term results achieved after appropriate case selection, careful handling of the soft and hard tissues and good occlusal harmony. But usually a common problem faced in case of missing teeth is lack of sufficient bone for implant placement and this may be due to local to general decrease of growth stimuli of the jaw due to absence of large numbers of teeth.

CONCLUSION

Ideally the implants are placed once the skeletal growth is completed, but in cases of partial or complete anodontia the use of implants is becoming popular. Placing implants in a child patient should be a team effort consisting of surgeon, pedodontist, prosthodontist, orthodontist and periodontist. There is no doubt that implants would greatly assist in prosthesis support. The clinician should understand the disadvantages of early placement and weigh those factors against esthetic and functional advantages afforded by implants.

Patients with implant assisted restorations should be evaluated frequently to ensure the health of the implant and its surrounding tissue as well as to assess the effect of the prosthesis on the overall growth and development of the jaws. An extremely vigilant recare programme is necessary.

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Correlation of Apoptotic Index and Bcl-2 Protein with Other Histological Prognostic Factors in Prostate Carcinoma

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ABSTRACT

This study was conducted to evaluate the correlation of Apoptotic Index and Bcl-2 protein expression immunohistochemically in Prostate Cancers with known histological prognostic factors in prostate Carcinoma including Gleason's score and Angiogenic index (AgCD-31). The study group consisted of 35 cases of prostate adenocarcinoma obtained from the patients admitted in Dept. of Surgery and from cancer registry of Department of SN Medical Collage Agra. The specimens were subjected to hematoxylin and eosin staining, Bcl-2 immuno histochemical staining, Apoptotic index calculation, Gleason's grading. Univariate analysis showed no correlation between apoptotic index (A.I.) & Gleason's grade [mean A.I. 2.23 ± 1.72 (intermediate grade) and 1 ± 0.85 (high grade); $p > 0.05$], negative correlation between apoptotic index and angiogenic index [mean angiogenic index = 109.82 (intermediate grade) & 247.35 (high grade); $p < 0.05$]. Bcl-2 showed a positive correlation with Gleason's grade (intermediate grade 7.69% & high grade 21.82%), but Bcl-2 positive immunoreaction was not correlated with apoptotic index ($p > 0.05$). Besides grading, quantification of Bcl-2 antiapoptotic protein and angiogenic index can be of value to predict prognosis of prostate carcinoma. Bcl-2 immunostain can be used on TURP specimens where often grading may not be representative of the entire specimen.

Keywords: Apoptotic Index, Bcl-2, Angiogenic index, Prostate cancer.

INTRODUCTION

The incidence of prostate adenocarcinoma has risen dramatically in the past decade, probably owing to early detection, by employing digital rectal examination, serum Prostate Specific Antigen (PSA) assay and transrectal ultrasonography. Latest estimates show that it has now become the most common form of cancer and second leading cause of cancer death in men¹. This change predominantly represents an increase in the number of cancers diagnosed rather than a real increase in the number of cancers in the population. Early detection has also resulted in increased life expectancy^{2,3}.

Molecular prognostic markers in carcinoma prostate are not a new concept. As we know three main factors are required for tumor establishment- 1) Doubling time of tumor cells, 2) Fraction of tumor cells that are in replicative pool and 3) Rate at which cells are shed and lost in the growing lesion. One of the important pathways is inhibition of apoptosis or programmed cell death which may be involved in the pathogenesis of cancer by prolonging cell life and facilitating retention of deleterious mutation. Among the most important regulators of apoptosis and programmed cell death are that of B- cell lymphoma proteins (Bcl-2) and its related proteins. The protein encoded by this gene is a potent blocker of apoptosis. Complex interaction among the three subgroups within the Bcl-2 family controls the signaling events of apoptosis⁴. Over-expression of the Bcl-2 protein occurs in a wide variety of human cancers and presumably contributes to neoplastic expansion by prolonging cell survival. Bcl-2 proteins at endoplasmic

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reticulum also regulate autophagy, a survival pathway that limits metabolic stress, genomic instability and tumourigenesis⁵. Among the most important regulators of apoptosis and programmed cell death are that of B- cell lymphoma proteins(Bcl-2) and its related proteins. The protein encoded by this gene is a potent blocker of apoptosis. Complex interaction among the three subgroups within the Bcl-2 family controls the signaling events of apoptosis⁴. Over-expression of the Bcl-2 protein occurs in a wide variety of human cancers and presumably contributes to neoplastic expansion by prolonging cell survival. Bcl-2 proteins at endoplasmic reticulum also regulate autophagy, a survival pathway that limits metabolic stress, genomic instability and tumourigenesis⁵.

In normal prostate Bcl-2 protein is present in the androgen independent basal cells that line the basement membrane of the prostate gland but not in the differentiated luminal secretory cells that are androgen dependent and undergo apoptosis when deprived of testosterone. In our study we evaluated the correlation of apoptotic index and Bcl-2 protein expression immuno-histocamically in prostate carcinoma with known histological prognostic factors like Gleason’s grading, scoring and angiogenic index.

Table 1. Case distribution of randomly sampled prostatic adenocarcinoma.

S. No.	Case Obtained	Number	Percentage
1	Trup	23	65.71
2	Radical Prostatectomy	11	31.43
3	Needle Biopsy	1	2.86
	Total	35	100.00

MATERIAL AND METHODS

Thirty five cases of prostate adenocarcinoma were randomly selected among the Patients registered in Department of Surgery and Pathology of S.N. Medical College, Agra. Random sampling of 35 cases consisted of 23 cases of TURP, 11 cases of Radical prostatectomy and one needle biopsy specimen Table 1. Haematoxylin - eosin stained slides from each specimen were reviewed and the Gleason’s grade was assigned. Tumours were classified as high grade when the combined Gleason’s score was _8 and intermediate when score was between 5 and 7 Apoptotic index was calculated in histological tumor material. Apoptotic index was calculated by measuring apoptotic cells per 1000 tumor cells per 10high power fields⁶. Immuno-histochemical staining for Bcl-2 and CD-31 was

performed by means of a modified labeled avidin-biotin technique, using monoclonal antibody and staining kit (DAKO LSAB2 System, HRP).The percentage of immunopositive tumour cells were scored as follows: 1=0 to <1%;2=1 to 25%; 3=26 to 50%; 4=51 to 75% and 5=76 to 100%. Immuno-staining intensity was rated as follows: 0(none); 1(weak); 2(moderate) and 3(intense). Specimens were considered immunopositive when ³ 1% of the tumour cells had clear evidence of staining. Micro vessels marked with anti-CD31 in highly vascular tumour areas were counted in four adjacent high power fields. Micro vessel density was calculated per square millimeter of tumour tissue.

Statistical analysis: We categorized our sample (total specimens=35) into two groups: intermediate (13) and high grade cases (22). There were no low grade adenocarcinomas (Gleason score _ 4) in any of our specimens. After calculating apoptotic index and angiogenic index and evaluating Bcl-2, the statistical analysis was performed to draw the significance, if any, amongst various grades of prostate adenocarcinoma. Chi-sq. test was applied to find out any correlation between apoptotic index and Bcl-2. By using student’s’t’ test correlation was observed between the angiogenic index and apoptotic index.

RESULTS

The study group consisted of 35 specimens of prostate adenocarcinoma which were categorized according to Gleason grading system. Apoptotic index was calculated using light microscopy on H&E stained sections. No statistically significant correlation was found between Gleason’s grade and apoptotic index (p>0.05): (Table-2): (Bar diagram). Bcl-2 immunostaining demonstrated highly variable expression in the malignant epithelium (Figure 1). On the average, 22.86% of cases were Bcl-2 positive. Bcl-2 positive percentage increased with increasing Gleason’s grade. Strong expression of Bcl-2 protein was related to high tumour category, metastatic disease, poor histological differentiation, weak infiltration of the tumour by lymphocytes. Statistically Bcl-2 and apoptotic index were not found to be significantly correlated (p=0.08).There were cases that showed apoptotic bodies and were Bcl-2 positive (Figure 2). These cases were also subjected to CD-31 staining to find out angiogenic index . It was observed that angiogenic index increased with increasing grade(Figure 3). It showed statistically significant correlation between angiogenic index and Gleason’s grade (p<0.05).

Table 2. Correlation of Gleason grade with apoptotic index (A.I.), Bcl2-immunopositive cases and angiogenic index (Ag CD-31).

S. No.	Gleason's grade	Cases		Bcl2 positive%	AgCD31
1	Intermediate grade (5-7)	13	0-6(2.23±1.72)	1(7.69)	109.82
2	High grade (8-10)	22	0-3(1.00±0.85)	7(21.82)	247.35
	TOTAL	35		8(22.86)	357.17



Fig. 1: Intense Bcl-2 positivity in Gleason Grade –III+IV (score=7) Adenocarcinoma (10x40).

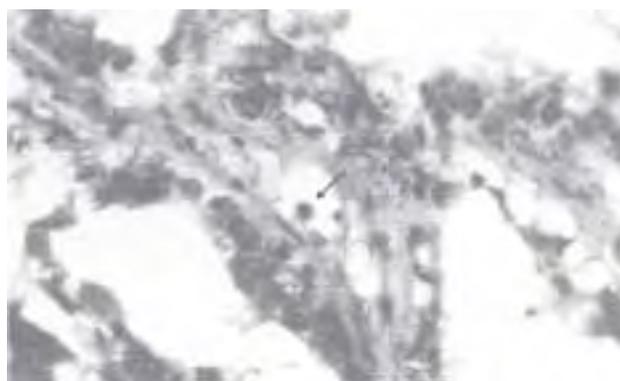


Fig.2: Apoptosis in Gleason Grade –III Adenocarcinoma (H& E 10 X 40)

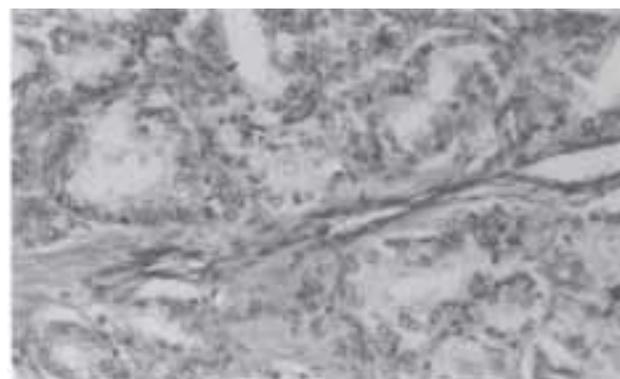


Fig. 3: Angiogenesis in Gleason Grade 3 Adenocarcinoma (CD 31 immunostain x 40)

DISCUSSION

Most prostate cancers, at the time of clinical diagnosis, present as mixture of androgen dependent and androgen independent cells. A vast majority of prostate cancers respond initially to androgen ablation since the population of androgen dependent cells undergoes rapid apoptosis upon androgen withdrawal. However, androgen ablation rarely cures patients, most of whom will experience recurrence due to takeover of the tumour mass by androgen independent tumour cells as well as emergence of apoptosis-resistant clones as a result of further genetic alterations such as Bcl-2 amplification. Proteins coded by the Bcl-2 family of genes are important regulators of programmed cell death and apoptosis⁸. Bcl-2 is a potent antiapoptotic protein which help in development of neoplasm, by maintaining the longevity of cells via suppressing their programmed death. Its expression is more common in tumour with invasive behavior, high proliferation rate and abnormal cell differentiation⁹. We observed a significant correlation in the Bcl-2 protein expression between the different tumour grades Table 2. The expression of Bcl-2 family in prostate cancer (gene bax, bcl-xl and mcl-1) positively correlates with Gleason’s grade⁷. Our results are in full agreement with those of Hering et al.¹⁰, who found positive correlation in frequency of Bcl-2 positive expression in prostate adenocarcinoma with low and high Gleason score. They concluded that over expression of Bcl-2 is significantly higher in patients with an initially elevated Gleason score (8, 9, and 10). The Bcl-2 expression probably exerts a role in the longevity of the cells submitted to hormonal therapy¹¹. Khor et al(2007)¹² observed that combination of negative Bcl-2 / normal Bax expression seemed more significantly related to reduced biochemical or any other treatment failure. In a previous analysis in prostate cancer it was suggested that the expression of Bcl-2 seems to be related to androgen independence, while in breast cancer expression of Bcl-2 is sex steroid dependent¹³. Accordingly, the results suggest that, along with increasing genetic instability (i.e. increased G-grade); the abnormal expression of Bcl-2 protein becomes more common in prostatic cancer. We observed that Bcl-2 positive immunoreaction did not correlate with apoptotic index (p=0.08). The relationship between inhibited apoptosis and expression of Bcl-2 protein is not clear cut; since Bcl-2 positive tumour also showed apoptosis. However, in these tumours the apoptosis rate may be reduced in relation to mitosis rate and other regulatory mechanisms, such as androgen and other growth factors may be involved. Expression of Bcl-2 protein is not a critical factor that determines the degree of apoptosis¹⁴.

In our study, we quantified apoptosis by calculating apoptotic index (A.I.) but did not find any correlation of A.I. with Gleason’s grade ($p > 0.05$). Findings of apoptotic index in prostate cancer were in accordance with those of Amirghofran et al.¹⁵, who did not observe any correlation between apoptosis and different grades of carcinoma. They found a significant correlation between bax expression and stage of carcinoma, but not with apoptotic index, suggesting the presence of non functional bax protein or the role of other proapoptotic molecules in oncogenesis. Similarly Brown et al (1996)¹⁶ found that the pathologic stage did not correlate with cell proliferation, apoptosis or overall daily growth. Their study concluded that cell proliferation and apoptosis do not correlate with pathological stage in clinically organ confined cancer. Similarly Matushima et al. (1998)¹⁷ showed A.I. does not correlate with Gleason score nor was there any significant correlation between AI and pathologic stage. Tu et al. (1996)¹⁸ found that localized prostate cancer cells exhibited a relatively low rate of apoptosis, which was significantly lower than the apoptotic index of normal prostate glandular epithelial cells. Metastatic prostate tumor cells, however, exhibited a significantly higher apoptotic index compared with localized prostate cancer cells.

In our study we observed that angiogenic index increases with Gleason’s grade and was inversely related to apoptotic index ($p < .05$) Spontaneous apoptosis is related inversely to angiogenesis and positively related to proliferative activity. Quantitative micro vessel density has been shown to provide important staging and prognostic information in prostatic carcinoma. Correlation between angiogenic index and apoptotic index has been shown to be altered significantly by androgen ablation¹⁷. The increase in micro vessels from low to high grade was in accordance with the finding of Bettencourt et al.¹⁹. They found that micro vessel density count in the tumour are significantly increased with increasing Gleason’s

sum and nuclear grade but did not increase significantly in adjacent benign prostate.

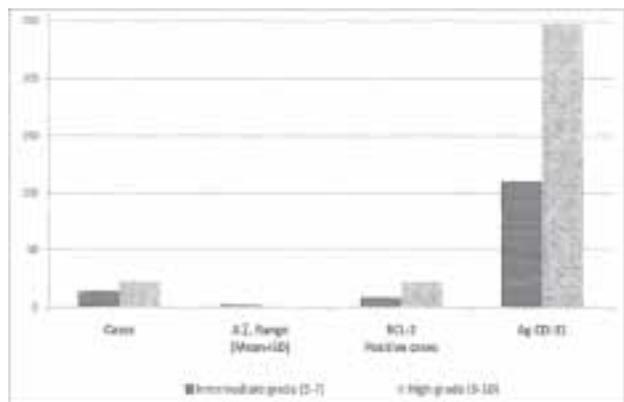
Thus beside grading, scoring, lymphovascular invasion, perineural invasion; quantification of Bcl-2 antiapoptotic protein and angiogenic index can be of value to predict prognosis of prostate carcinoma. Bcl-2 immunostain can be used on TURP specimens where often grading and scoring may not be what is given, as radical prostatectomy is not done. Similar large scale studies are required to derive a cut-off value of bcl-2 immuno positivity which may help in predicting progression of patients and their better management. It is also seen that high

Bcl-2 positivity is present at the spreading edge of the tumour. The reason of this interesting finding could be decreased apoptosis at the spreading edge ensuring survival of cells to achieve invasiveness or it could be that malignant neoplasm has different cell kinetics in different areas according to survival/invasive need.

Of the many new molecular prognostic markers being evaluated in carcinoma prostate Bcl-2 and angiogenic index appear to have promise. There is an increase in Bcl-2 positive percentage with increasing Gleason’s grade and a significant inverse correlation ($p < 0.05$) exists between angiogenic index and apoptotic index. These biomarkers appear useful in Radical Prostatectomy as well as TURP (Trans urethral resection of prostate) specimens.

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Bar- diagram — Showing A. I, Bcl-2 and angiogenic activity in intermediate and high grade prostatic carcinoma.

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Dental Care in Diabetes: A Review

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ABSTRACT

The prevalence of diabetes is increasing worldwide. Diabetic population is growing fastest in south Asian region. Currently India is having more than 45 million diabetics. As the longevity of diabetic patients is being increased due to effective diagnostic protocols, increasing awareness and better treatment options available, more and more dentist has to come across diabetic population with dental problems. Therefore, it is important for dentists to be aware of medical and dental management considerations for this expanding patient population. Diabetes mellitus can have a significant impact on the delivery of dental care¹.

INTRODUCTION

The link between diabetes and oral health can't be ignored. In fact, dental problems in people with diabetes are so rampant that Mark Finney, DDS, believes oral disease should be referred to as "the sixth 'opathy' of diabetes," deserving of the attention given to retinopathy, neuropathy, nephropathy and the likes. While everyone is prone to periodontitis, or diseases of the tissues surrounding the teeth and gingiva, people with diabetes often have more severe cases that can both cause and predict additional diabetic complications. So for people with diabetes, getting that cleaning and check-up are especially important. Unfortunately, most diabetics do not pay enough attention to the increased need for oral care and the potential for dental problems that accompany this disease.²

ORAL COMPLICATIONS

The first oral complication of diabetes is periodontal disease, which stems from a chronic inflammation caused by various types of bacteria and microbes in the oral cavity of diabetics. The first stage of periodontal disease is gingivitis, which occurs when the bacteria in dental plaque irritate the gingiva and cause infection, to which your body responds by causing the gums to become red and swollen and bleed easily. Gingivitis only rarely causes discomfort, and therefore, it is especially important that diabetic patients train themselves to be aware of even slight changes in gum tissue and consult with their medical and dental care providers. It is important to note that gingivitis in diabetics is a direct result of poor glycemic

control, and is not because of higher levels of plaque accumulation. Diabetes does not significantly increase plaque. Getting and keeping your blood sugar level even will go a long way toward solving your gingival problems. Research indicates that the risks of developing periodontal disease appears to increase over time for those with diabetes; while those who have had diabetes for fewer than 10 years are less likely to lose teeth due to the complications of their disease.²

Improving control over blood sugar levels is the best way a person with diabetes can improve overall oral health, because diabetes weakens the body's normal defenses against disease. Diabetes also adversely affects salivary gland production, causing xerostomia, or dry mouth, which leads to having higher concentrations of glucose in saliva and bacteria in the mouth. Elevated salivary glucose and dry mouth both increase the likelihood of dental cavities.³

HOW XEROSTOMIA AFFECTS ORAL HEALTH

When the normal environment of the mouth is altered due to a decrease in salivary flow or alteration in salivary composition, a healthy mouth becomes is not only at risk for tooth deterioration, but can suffer from dry, cracked oral tissue as well, which leads to mouth ulcers; an inflamed tongue and inflamed mucosal tissues lining the mouth more likely.

In addition to adversely affecting salivary glands, diabetes causes blood vessels to thicken, which in turn slows down the flow of blood to body tissues, including the gums and dental bones. Good blood flow is essential to provide important nutrients and

eliminate harmful wastes from body tissues, including tissues of the mouth. Lowered blood flow causes the gum and bone tissue that support the teeth to become less healthy and less resistant to infection from the bacteria found in dental plaque.⁴

The most common reasons for a dry mouth in a diabetes patient are:

- Side effects of medication
- Neuropathy (autonomic)
- Lack of hydration
- Kidney dialysis
- Hyperglycemia
- Mouth breathing
- Smoking

Some clinical signs of dry mouth

- Loss of moisture, glistening of the oral mucosa
- Dryness of the oral membranes
- Irritated corners of the mouth (cheilitis)
- Gingivitis
- Difficulty wearing dentures
- Mucositis
- Mouth sores
- Yeast infection (Candidiasis), especially on the tongue and Palate.
- Dental cavities: increased prevalence and located in sites generally not susceptible to decay

Dental Care for Dry Mouth Patients

The diabetes patient with dry mouth along with his or her oral health team will have to develop a routine for optimal oral health.

Here are some simple ways to accomplish that goal:

- Perform oral hygiene at least four times daily, after each meal and before bedtime.
- Rinse and wipe the mouth immediately after meals.
- Brush and rinse removable dental appliances after meals.
- Use only toothpaste with fluoride. Some toothpastes (such as Biotene) are formulated for dry mouth.
- Keep water handy to moisten the mouth at all times.
- Apply prescription-strength fluoride at bedtime as prescribed.
- Avoid liquids and foods with high sugar content.
- Avoid overly salty foods.
- Limit citrus juices (orange, grapefruit, tomato), as well as diet sodas.
- Avoid rinses containing alcohol. Several nonalcoholic mouthwashes are now available on the market.

- Use a lip balm or moisturizer regularly.
- Try salivary substitutes, gels or artificial saliva preparations. These may relieve discomfort by temporarily wetting the mouth and replacing some of the saliva constituents.
- In severe cases, use of pilocarpine might be used under a physician's care.^{4,5}

Diabetics also face increased susceptibility to getting other nasty dental health problems such as oral yeast infections, gingival abscesses, lichen planus, burning mouth syndrome and possible difficulties in wearing dental prosthetics.

Though diligent blood sugar control is the most important factor in maintaining Diabetic's oral health, rigorous dental hygiene is also imperative for those with this disease, for without it oral health problems can multiply exponentially. No one should smoke cigarettes, and this is especially true for diabetics. Smoking is injurious to gums and mouth tissues and only adds to diabetic dental health problems.

If all of this sounds like bad news, there is an upside: Diabetics who keep their blood sugar levels in check can usually receive any dental treatments that patients without diabetes can receive, which is especially important if you want to undergo cosmetic dental procedures to improve your smile.^{7,8}

Management issues of operative dentistry among diabetics:

To minimize the risk of an intraoperative emergency, clinicians need to consider a number of management issues before initiating dental treatment.

Medical history: It is important for clinicians to take a good medical history and assess glycemic control at the initial appointment. They should ask patients about recent blood glucose levels and frequency of hypoglycemic episodes. Antidiabetic medications, dosages and times of administration should be determined. A variety of other concomitantly prescribed medications may alter glucose control through interference with insulin or carbohydrate metabolism. The hypoglycemic action of sulfonylurea's may be potentiated by drugs that are highly protein-bound, such as salicylates, dicumerol, β -adrenergic blockers, monoamine oxidase inhibitors, sulfonamides and angiotensin-converting enzyme inhibitors. Epinephrine, corticosteroids, thiazides, oral contraceptives, phenytoin, thyroid products and calcium channel-blocking drugs have hyperglycemic effects.

In general, morning appointments are advisable since endogenous cortisol levels are generally higher at this time.

Patients undergoing major surgical procedures may require adjustment of insulin dosages or oral antidiabetic drug regimens. Any complications of DM, such as cardiovascular or renal disease, will have their own effects on dental treatment planning. If necessary, the dentist should consult with the patient's physician⁸.

Scheduling of visits: In general, morning appointments are advisable since endogenous cortisol levels are generally higher at this time (cortisol increases blood sugar levels). For patients receiving insulin therapy, appointments should be scheduled so that they do not coincide with peaks of insulin activity, since that is the period of maximal risk of developing hypoglycemia.

Diet: It is important for clinicians to ensure that the patient has eaten normally and taken medications as usual. If the patient skips breakfast owing to the dental appointment but still takes the normal dose of insulin, the risk of a hypoglycemic episode is increased. For certain procedures (for example, conscious sedation), the dentist may request that the patient alter his or her normal diet before the procedure. In such cases, the medication dose may need to be modified in consultation with the patient's physician.

Blood glucose monitoring: Depending on the patient's medical history, medication regimen and procedure to be performed, dentists may need to measure the blood glucose level before beginning a procedure. This can be done using commercially available electronic blood glucose monitors, which are relatively inexpensive and have a high degree of accuracy. Patients with low plasma glucose levels (< 70 mg/dl for most people) should be given an oral carbohydrate before treatment to minimize the risk of a hypoglycemic event. Clinicians should refer patients with significantly elevated blood glucose levels for medical consultation before performing elective dental procedures.

During treatment: The most common complication of DM therapy that can occur in the dental office is a hypoglycemic episode. If insulin or oral antidiabetic drug levels exceed physiological needs, the patient may experience a severe decline in his or her blood sugar level. The maximal risk of developing hypoglycemia generally occurs during peak insulin activity. Initial signs and symptoms include mood changes, decreased spontaneity, hunger and weakness. These may be followed by sweating, incoherence and tachycardia. If untreated, possible consequences include unconsciousness, hypotension, hypothermia, seizures, coma and death.

If the clinician suspects that the patient is experiencing a hypoglycemic episode, he or she should

terminate dental treatment and immediately administer 15 grams of a fast-acting oral carbohydrate such as glucose tablets or gel, sugar, candy, soft drinks or juice. It is important to note that the α glycosidase inhibitors prevent the hydrolysis of sucrose into fructose and glucose. Therefore, a hypoglycemic episode in a patient taking these drugs should be treated with a direct source of glucose. After immediate treatment, dentists should measure blood glucose levels to confirm the diagnosis and determine if repeated carbohydrate dosing is needed. If the patient is unable to swallow or loses consciousness, the dentist should seek medical assistance; 25 to 30 ml of a 50 percent dextrose solution or 1 mg of glucagon should be administered intravenously. Glucagon also can be injected subcutaneously or intramuscularly⁷.

It is important for dentists to educate patients about the oral implications of diabetes mellitus. Among the mechanisms thought to produce the tissue damage associated with chronic hyperglycemia are glycation of tissue proteins and excess production of polyol compounds from glucose¹. People with poorly controlled DM also may have impaired wound healing and increased susceptibility to infections. Some people experience peripheral and autonomic neuropathies such as numbness and tingling of extremities, oral paresthesia and burning.

Severe hyperglycemia associated with type 1 ketoacidosis or type 2 hyperosmolar nonketotic state usually has a prolonged onset. Therefore, the risk of a hyperglycemic crisis is much lower than that of a hypoglycemic crisis in a dental practice setting. Ketoacidosis may develop, with nausea, vomiting, abdominal pain and an acetone odor. Definitive management of hyperglycemia requires medical intervention and insulin administration. However, it may be difficult to differentiate between hypoglycemia and hyperglycemia based on symptoms alone. Therefore, the dentist should administer a carbohydrate source to a patient in whom a presumptive diagnosis of hypoglycemia is made. Even if the patient is undergoing a hyperglycemic episode, the small amount of additional sugar is unlikely to cause significant harm⁷. The clinician should measure blood glucose levels after immediate treatment.

After treatment: Clinicians should keep in mind these postoperative considerations. Patients with poorly controlled DM are at greater risk of developing infections and may demonstrate delayed wound healing. Acute infection can adversely affect insulin resistance and glycemic control, which, in turn, may further affect the body's capacity for healing. Therefore, antibiotic coverage may be necessary for patients with overt oral infections or for those undergoing extensive surgical procedures.

If the dentist anticipates that normal dietary intake will be affected after treatment, insulin or oral antidiabetic medication dosages may need to be appropriately adjusted in consultation with the patient's physician. Salicylates increase insulin secretion and sensitivity and can potentiate the effects of sulfonylurea's, resulting in hypoglycemia. Therefore, aspirin and aspirin-containing compounds generally should be avoided for patients with DM⁸.

The following tips are from the National Institute of Dental Health:

- Controlling your blood glucose is the most important step you can take to prevent tooth and gum problems. People with diabetes, especially those whose blood glucose levels are poorly controlled, are more likely to get gum infections than non-diabetics. A severe gum infection can also make it more difficult to control your diabetes. Once such an infection starts in a person with diabetes, it takes longer to heal. If the infection lasts for a long time, the diabetic person may lose teeth.
- Much of what you eat requires good teeth for chewing, so it is extremely important to try to preserve your teeth. Because the bone surrounding the teeth may sometimes be damaged by infection, dentures may not always fit properly and may not be perfect substitutes for your natural teeth.
- Taking good care of your gums and teeth is another important measure. Use a soft-bristle brush between the gums and the teeth in a vibrating motion. Place the rubber tip of the toothbrush between the teeth and move it in a circle.
- If you notice that your gingiva bleeds while you are eating or brushing your teeth, see a dentist to

determine if you have a beginning infection. You should also notify your dentist if you notice other abnormal changes in your mouth, such as patches of whitish-colored skin.

Have a dental checkup every six months. Be sure to tell your dentist that you have diabetes and ask him or her to demonstrate procedures that will help you maintain healthy teeth and gums.

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A Study of Variations in Origin, Length, Course and Termination of Internal Thoracic Artery

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ABSTRACT

Internal Thoracic Artery (ITA), also called as Internal Mammary Artery (IMA), arises from the inferior aspect of the first part of the subclavian artery, opposite to the origin of thyro-cervical trunk. It descends vertically 1cm away from the lateral border of the sternum and terminates in 6th intercostal space dividing into musculophrenic and superior epigastric arteries. As Internal Thoracic Artery is most commonly used as cardiac conduit (graft) to bypass occluded or nearly occluded coronary arterial segments in coronary arterial bypass graft (CABG) surgery, cardiac surgeons should know the possible variations pertaining to its origin, length, course, branches, termination and diameter at various intercostal spaces, to choose the level for bypass.

As per dissection procedure given in Cunningham's 15th edition vol-02, anterior thoracic cage was separated in 25 cadavers. Study on internal thoracic arteries carried out by painting arteries. In 84% the arteries were taking origin from I-part of Subclavian artery, 10% from thro-cervical trunk, 4% from suprascapular and transverse cervical artery. 2% arising from suprascapular artery alone, in 88% it is getting terminated at 6th intercostals space, 10% in 5th intercostals space and 2% in 4th intercostals space and mean length 18 cms on right side, 18.30cms on left side.

Key words: *Internal thoracic artery, Internal mammary artery, CABG (coronary arterial bypass graft)*

INTRODUCTION

The study of internal thoracic artery also called INTERNAL MAMMARY ARTERY has gained utmost importance in cardiac surgeries. In this era, there is a rise in mortality rate due to heart attack or myocardial infarction secondary to coronary artery block. Coronary atherosclerosis and its associated mortality, it is readily understandable that Coronary bypass grafting is one of the most common surgical procedures. The artery arises from Subclavian artery behind the sternal end of Clavicle and in 6th intercostals space by dividing into Musculophrenic and Superior epigastric arteries⁵.

The internal thoracic arteries and segments of the radial artery or saphenous veins and inferior epigastric arteries are commonly used conduits to bypass occluded or nearly occluded coronary arterial segments. Internal thoracic artery is being preferred to venous conduits due to the fact that there is low incidence of atherosclerosis and it has a high patency rate due to good endothelial functions. Endothelial derived relaxing factor, nitric oxide as well as prostacylin are shown to be produced by human internal thoracic artery, which is the contributing factor

in its high patency rate and making it to be structurally suitable for withstanding arterial pressures.

AIMS AND OBJECTIVES

1. Normal pattern and any variation in origin, course, branching length and level of termination.
2. Pattern in either sexes and variation in right and left sides

Work was undertaken to throw more light for cardiac surgeons to perform coronary bypass grafting and to the plastic surgeons to perform postmastectomy microvascular breast reconstruction and for interventional radiologist.

MATERIALS AND METHODS

A total number of 50 specimens of internal thoracic artery (25 right sided, 25) left sided from 20 males and 5 females cadavers given for dissection to undergraduates students in department of Anatomy and also from the department of Forensic medicine.

The scalenus anterior muscle was identified; the first part of Subclavian artery and its branches were

dissected. The ribs were cut about 5cms away from costochondral junction on both sides first down to 8th ribs. The anterior thoracic wall was lifted from above downwards gradually separating from the underlying structures. Finally, a cut is made across, joining the lower ends of the two vertical cuts of right and left sides to free the anterior thoracic wall with internal thoracic artery of both sides⁶. The specimens were washed with water to get rid of clots and connective tissue and preserved with 10% formalin.1:10 thin solution of fevibond in acetone was prepared, arteries were painted afterwards colored with red oil color, and specimens were allowed to dry.

Following statistical methods were applied in the present study,

1. Cross tabs procedure (Contingency coefficient test)
2. Chi-square test
3. Descriptive statistics
4. Independent samples 't' test

All the statistical operations were done through SPSS for Windows (version 14.0-Evaluation version), SPSS Inc. New York.

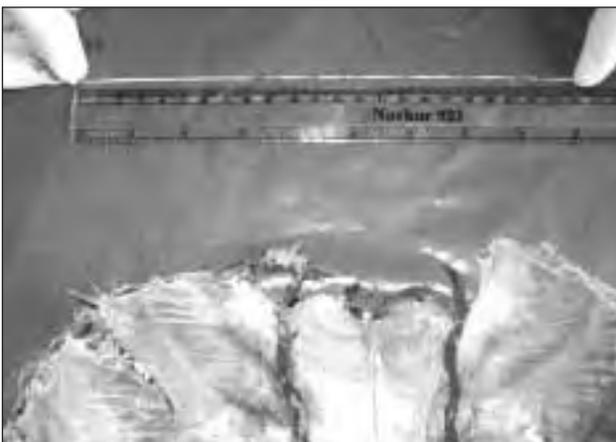


Fig. 1 and 2: Measurement of the Total Length of the Artery.

RESULTS

Table 1. ITA specimens grouped according to their pattern of origin and their percentage.

S. No	TYPE	SIDE	TOTAL	%	GRAND TOTAL	Total %
1	Normal origin from the first part of Subclavian artery	Right	22	44	42	84
		Left	20	40		
2	Arising with Thyrocervical trunk	Right	02	04	05	10
		Left	03	06		
3	Arising with Suprascapular artery	Right	01	02	01	02
		Left	NIL	--		
4	Arising with Suprascapular artery and Transverse cervical artery	Right	NIL	--	02	04
		Left	02	04		

Table 2. ITA specimens grouped according to their termination in the intercostal spaces

S. No	Termination	SIDE	TOTAL	%	GRAND TOTAL	Total %
1	6th ICS	Right	21	42	44	88
		Left	23	46		
2.	5th ICS	Right	03	06	05	10
		Left	02	04		
3.	4th ICS	Right	01	02	01	02
		Left	NIL	-		

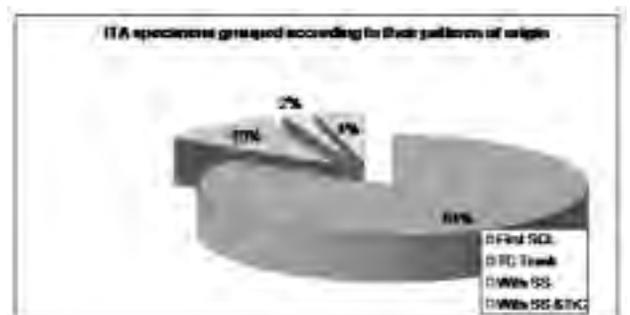
Chi-Square () = 67.72, P < 0.000 (highly significant).

Table 3. Mean Length of Internal Thoracic artery in male (in cm).

	Male		
	Right	Left	
Mean Length	18.00	Mean Length	18.29
Std. Deviation	0.3408	Std. Deviation	0.3331

Table No.4: Mean Length of Internal Thoracic artery in female (in cm).

	Female		
	Right	Left	
Mean Length	18.05	Mean Length	18.36
Std. Deviation	0.3954	Std. Deviation	0.2123



Graph 1: Pie chart showing variations in the pattern of origin of ITA specimens (%).



Graph 2: Graph showing ITA specimens grouped according their termination in the intercostal spaces.

DISCUSSION

The study of Internal Thoracic Artery has gained its utmost importance in cardiac surgeries and it is most commonly used graft in CABG. Bypass surgeries are done to bypass the occluded or nearly occluded coronary arterial segments, to relieve ischemic symptoms, persistent angina or congestive heart failure from severe occlusive diseases of the coronary arteries.

A total of 50 specimens of internal thoracic arteries were studied by dissection method to know the possible variations pertaining to its origin, length, course, branches, termination and inner luminal diameter at origin, 2nd ICS, 4th ICS & 6th ICS, to help the cardiac surgeons to choose the level for bypass surgeries, to assist the plastic surgeons in the post mastectomy microvascular breast reconstruction surgeries, wherein perforating branches of the artery are the recipient vessels and to give the information to the radiologists to have sound knowledge about the possible anatomical variations of the artery that they can come across during radiological investigations.

According to Daseler E.H. and Anson B. J., the origin of the artery is variable¹.

Based on a study of 769 dissected specimens, it has been observed that the internal thoracic artery took origin as follows

- From the first part of Subclavian artery (609 of 769, 79.19%; Rt-324, Lt- 285).
- From common stem with thyrocervical trunk (68 of 769 extremities; 8.84%; Rt-11, Lt-57).
- From common trunk with suprascapular artery (29 of 769 extremities, 3.77%; Rt-9, Lt-20).
- As a direct branch of second part of subclavian artery (28 of 769 extremities, 3.64%; Rt- 6, Lt-22).
- From common trunk with inferior thyroid artery (9 of 769 sides, 1.17%; Rt-5, Lt-4).

- From direct common trunk with transverse cervical artery (6 of 769 sides, 0.78%; Rt-2, Lt-4).
- As direct branch from 3rd part of subclavian artery (6 of 769 sides, 0.78%; Rt-4, Lt- 2).
- From common trunk with superior intercostal artery (6 of 769 sides, 0.78%; Rt-4, Lt-2).
- As direct branch of axillary artery (4 of 769 sides, 0.52%; Rt- 2, Lt-2).
- Internal thoracic, transverse cervical, suprascapular arteries, all from common trunk (2 of 769 extremities, 0.28%; Rt-1, Lt-1).

Comparison of present work with that of Daseler EH and Anson B.J¹

Normal origin of the artery from first part of Subclavian artery is 84% in the present study compared with 79.19% in above workers. Similarly, the artery taking origin with Thyrocervical trunk is 10% in the present work compared to 8.84% in above anatomists study. Origin of the artery with suprascapular and transverse cervical arteries is 4% in the present study compared to 0.28% in above workers.

To determine the relationship of the Phrenic nerve to internal thoracic artery, it has been analyzed that the nerve passes from lateral to medial behind the first rib, was found to cross the artery superiorly and remains medially in 16 of 25 specimens on the left and 12 of 25 on right side, but other specimens, it crosses inferiorly. These findings were similar to the findings of Owens WA & Gladstone DJ³. And therefore, it can be concluded that there is no constant relationship between these structures.

SUMMARY

The study of Internal Thoracic Artery (ITA) has gained its utmost importance in cardiac surgeries and most commonly used graft in coronary arterial bypass surgeries (compared to other grafts like Radial artery, Saphenous vein etc). CABG procedure is done to bypass occluded or nearly occluded coronary arterial segments to relieve ischemic symptoms, persistent angina or congestive heart failure from severe occlusive diseases of the coronary arteries.

A total of 50 specimens of internal thoracic arteries were studied by dissection method to find out the possible variations pertaining to its origin, length, course, branches, termination and inner luminal diameter at origin, 2nd ICS, 4th ICS & 6th ICS, with aim to guide the cardiac surgeons to choose the level for bypass graft surgeries(CABG), to help the plastic surgeons in post mastectomy micro vascular breast reconstruction (TRAM-Transverse Rectus Abdominis Myocutaneous flap technique, wherein perforating branches of the artery are the recipient vessels)⁴ and

use of the anatomical proximity of interanal mammary artery to the left anterior descending artery(left anterior interventricular branch) in coronary bypass graft provided to be having good results.²

- Internal thoracic artery most commonly takes origin from the first part of Subclavian artery (84%).
- There is no constant relationship between phrenic nerve and the artery at or above the first rib which emphasize the need for the caution for dissecting ITA at that level.
- Internal thoracic artery most commonly terminates in 6th ICS (88%) and mean total length being more on left side than right side by 0.30 cm.
- The mean total length of the artery on the left side is more than the right side by 0.30 cm.

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Efficacy of Computerized Tomography (CT) in Identification of Clinically Un-detectable Lymph Nodes in Patients with Oral Squamous Cell Carcinoma - An Observational Study

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ABSTRACT

Background: The most common malignant tumour of head and neck region is Oral squamous cell carcinoma and is the third most common malignancy in India. The most common mode of metastasis is through the cervical lymph nodes. Detection of tumours is mostly done clinically by direct visual examination. The complexity in predicting the presence of metastatic disease in clinically negative necks has led to wide spread use of elective neck dissection. This present study is intended to evaluate the status of clinically not detectable lymph nodes using.

Computerized Tomography : (CT) which might help in determining the prognosis and treatment plan and also to compare the accuracy between the clinical examination and CT.

Methods: Forty patients who have been histopathologically diagnosed as Oral squamous cell carcinoma were included in the study. The patients were subjected to clinical as well as CT examination. The findings of both examinations were correlated with pathological findings from the neck dissection.

Results: Number of True positives detected by clinical examination (CE) versus CT is 7 and 13 respectively ($p=0.17$). Number of True negatives detected by CE versus CT is 18 and 18 respectively ($p=1$). Number of False positives detected by CE versus CT is 5 and 5 respectively ($p=1$). Number of False negatives detected by CE versus CT is 10 and 4 respectively ($p=0.1$). Sensitivity for CE versus CT is 41.1% and 68.4% respectively ($p=0$). Specificity for CE versus CT is 78.2% and 78.2% respectively ($p=1$). Positive Predictive Value for CE versus CT is 58.3% and 72.2% respectively ($p=0.001$). Negative Predictive Value for CE versus CT is 64.2% and 75% respectively ($p=0.001$). Accuracy of CE versus CT is 62.5% and 77.5% respectively ($p=0.001$).

Conclusion: The present result indicates that CT is an important image tool for detection of clinically occult lymph nodes of head and neck in patients with oral squamous cell carcinoma and statistically significant over the clinical examination regarding the sensitivity, true predictive value, false predictive value and over all accuracy.

Key words: CT, Cervical lymphnodes, Oral squamous cell carcinoma, Clinical examination

INTRODUCTION

Oral cancer comprises majority of head and neck cancers. They account for 3-5% of all malignancies¹. Worldwide, oral carcinoma is one of the 10 most common causes of death². The most common malignant tumour of head and neck region is Oral

squamous cell carcinoma and is the third most common malignancy in India³. The most common mode of metastasis in Oral squamous cell carcinoma is through cervical lymph nodes. Of the estimated 800 lymph nodes in the human body, about 300 lymph nodes are situated in the neck.⁴ The metastasis of head and neck carcinomas to regional lymph nodes is complicated by extensive anastomotic and parallel systems of cervical lymphatics⁵. Detection of tumours are mostly done clinically by direct visual examination. Although palpation has advantage of being both easy and inexpensive to perform and can be repeated, it is generally accepted to be inaccurate⁶. The complexity in predicting the presence of metastatic disease in

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clinically negative necks has led to wide spread use of elective neck dissection⁷. Currently apart from the physical palpation, several modalities are available for investigating the presence and extent of cervical nodal metastasis. Imaging has great impact on treatment of head and neck cancers^{8,9}. Imaging modalities that are used to evaluate the oral cavity includes plain radiography (panoramic and intraoral radiography), nuclear medicine scintigraphy, ultrasound, magnetic resonance imaging, computed tomography and positron emission tomography. However, there are apprehensions regarding the efficacy of these investigations.

OBJECTIVE

To evaluate the status of clinically not detectable lymph nodes using Computerized Tomography in patients with Oral squamous cell carcinoma which might help in determining prognosis, treatment and also to compare accuracy between the clinical examination and Computerized Tomography in the evaluation of cervical lymph node metastasis.

MATERIALS AND METHODS

This is observational study and was conducted in the wing of Oral Medicine and Radiology at A.V. Super specialty dental hospital. 40 who have been histopathologically diagnosed as Oral squamous cell carcinoma were included in the study. All patients were drawn from outpatient department of A.V. Super Specialty Dental Hospital and MNJ Institute of Oncology and Regional Cancer Centre, Hyderabad. Before conducting the study ethical clearance has been obtained from ethical clearance committee of GSL Medical College and Hospital, Rajahmundry. Information regarding the nature and purpose of the study was thoroughly explained to every patient and a written consent was obtained. A structured Questionnaire has been filled which includes a detailed case history, clinical examination (CE), histopathological, radiological, and haematological findings. CE was performed using a disposable latex rubber gloves and a mouth mirror. Measuring tape, ruler and a divider were used to assess the extent of lesion and size of lymph nodes.

CLINICAL EXAMINATION OF LYMPH NODES

Palpation of lymph nodes were done commencing with most superior nodes and working down to the clavicle. Submandibular lymph nodes in the submandibular triangle were palpated from behind the patient's chin tipped slightly toward the chest. With fingers cupped and tips pressed lightly against the Mylohyoid muscle, the tissue is rolled laterally across

inferior border of the mandible. The Submental lymph nodes are palpated in the Submental triangle under chin. The nodes along the anterior triangle (nodes located along the anterior aspect of Sternocleidomastoid muscle) are palpated with the patients head tipped slightly forward and area medial to the Sternocleidomastoid muscle is pressed with finger tips. The fingers are rotated along the entire length of the muscle. The nodes in the posterior triangle are palpated by placing the finger tips behind the muscle. Palpation is started at Trapezius muscle and moved to the Sternocleidomastoid muscle. The Suboccipital nodes have been in the posterior triangle at the base of the skull. The Supraclavicular lymph nodes are palpated in Subclavian triangle by tipping the patients head forward, to relax the muscles in the neck. The finger is placed in the triangle, and the area is palpated with a rotary motion. The primary tumor along with the lymph nodes were staged clinically using the TNM system developed by the American Joint Committee on Cancer. The palpable lymph nodes were documented according to the number, size, consistency and mobility. The site was recorded according to the levels of the lymph nodes in the neck.

Later each patient underwent a spiral CT with a Somatom Emotion (Siemens) scanner. Scanning was performed in an axial plane in 3-5mm thick contiguous sections at a table speed of 5mm per second after the administration of 50 ml of non ionic contrast medium (Omnipaque or Iohexol) at a rate of 1-1.5 ml/sec. The patients subjected to CT were positioned in a supine position with the chin elevated. Transverse scans were obtained from the supraclavicular fossa to the base of the skull parallel to the inferior border of the mandible. Scanning began after a delay of 50-60 seconds. Scanning parameters were 140 kv and 160 mA. The period of CT scan to the neck dissection was within 35 days.

All CT scans were evaluated retrospectively without the knowledge of the clinical staging. The neck nodes were classified into different anatomical levels based on the Imaging Based Nodal Classification developed by Peter M. Som, Hugh D.Curtin and Anthony A.Mancuso.

The lymph nodes were diagnosed as positive for metastasis if the following criteria were met.

1. Lymph nodes size greater than 1.5 cm for level I node and 1.0 cm for rest of the subsequent nodes along the short axis.
2. Three or more lymph nodes in the primary drainage area.
3. Lymph nodes with central nodal necrosis and peripheral rim enhancement after intravenous contrast.

4. Round shape of lymph nodes.
5. Extracapsular spread of the disease.

After neck dissection was performed, the surgical specimen was subjected to the histopathological examination of pathology where the lymph nodes were dissected and classified the nodes into levels as indicated by the surgeon. The nodes were then fixed in formalin, embedded in paraffin, sectioned and stained with haematoxylin and eosin. All nodes were microscopically evaluated by a pathologist for the presence of malignancy at each level. A node was considered positive when there was evidence of tumour on histopathological examination. The clinical examination and CT findings were correlated with pathological findings from the neck dissection. Sensitivity, Specificity, Negativity, Positive Predictive Value and Accuracy were calculated for the both the clinical examination and CT.

Statistical analysis was performed using the Chi Square Test and differences were considered significant when the **P** value is less than **0.05**.

RESULTS

Out of these 40 patients included in the present study, 19(47.5%) were males and 21(52.5%) were female. The age group ranged from 25 years to 68 years with a mean of 46.5 years.

In the total 40 cases, 15 were involving buccal mucosa (37.5%), 11 were involving tongue (27.5%), 9 were involving the gingivoalveolar region (22.5%), 4 were involving palate (10%) and in 1(2.5%) patient there was retromolar trigone involvement. In present sample five patients were classified as T1, 26 patients as T2, 4 patients as T3 and 5 patients as T4. Of the 40 cases, 27 (67.5 %) patients were histologically graded as grade I (Well Differentiated), 11(27.5%) patients as grade II (Moderately Differentiated) and 3 (7.5%) patients as grade III (Poorly Differentiated).

CLINICAL EXAMINATION

Of the 40 patients examined, 12 were clinically diagnosed as positive nodes. Among those 12 patients seven had pathological evidence of metastasis. Hence these cases were considered as true positive (58.33%). 5 patients with clinically positive showed no histopathological evidence of metastasis. These were grouped as false positive (41.66%). In 28 of clinically negative cases, pathologic confirmation of absence of metastatic disease was reported in 18 cases. These were grouped as true negative (64.28%) and 10 cases which

have shown to be clinically positive showed negative nodes histopathologically (35.71%).

CT SCANNING

Of the 40 patients evaluated by CT, 18 patients showed positive neck nodes. Out of these 18 patients, 13 were histopathologically proved to be positive (true positive – 72.22%). In other 5 patients although CT showed positive nodes, pathological examination showed no evidence of neck metastasis (false positive – 27.78%). 22 patients showed negative nodes on CT, out of which 18 patients were histopathologically negative (true negative – 81.81%) and 4 patients showed metastatic nodes histopathologically (false negative –18.19%)

HISTOPATHOLOGY

Out of 40 patients, 17 (42.5%) were found to be positive on histopathologic analysis and 23 were negative (57.5%). Out of 17 pathologically positive nodes, 7 patients were correctly diagnosed clinically where as CT was able to diagnose 13 patients.

OCCULT GROUP

10 out of 40 patients have evidence of neck metastatic involvement with no clinical evidence of neck disease. Of these clinically negative necks, 4 patients were identified by CT as negative and 6 patients showed positive in CT. this is to say that CT was able to upstage the neck in 6 patients.

STATISTICAL ANALYSIS

Table 1. Number of true positives detected by clinical examination versus CT

Diagnostic Aid	True Positive	chi-value	p-value
Clinical Examination	7	1.8	0.17
CT	13		

Table 2. Number of true negatives detected by clinical examination versus CT

Diagnostic Aid	True Negative	chi-value	p-value
Clinical Examination	18	0	1
CT	18		

Table 3. Number of false positives detected by clinical examination versus CT

Diagnostic Aid	False Positive	chi-value	p-value
Clinical Examination	05	0	1
CT	05		

Table 4. Number of false negatives detected by clinical examination versus CT

Diagnostic Aid	False Negative	chi-value	p-value
Clinical Examination	10	2.57	0.1
CT	04		

Table-5: Sensitivity for clinical examination versus CT

Diagnostic Aid	Sensitivity	chi-value	p-value
Clinical Examination	41.17%	6.77	0.00
CT	68.42%		

Table 6. Specificity of clinical examination versus CT

Diagnostic Aid	Specificity	chi-value	p-value
Clinical Examination	78.26%	0.00	1.00
CT	78.26%		

Table 7. Positive Predictive Value of clinical examination versus CT

Diagnostic Aid	Positive Predictive Value	chi-value	p-value
Clinical Examination	58.33%	1.47	0.001
CT	72.22%		

Table 8. Negative Predictive Value of clinical examination versus CT

Diagnostic Aid	Negative Predictive Value	chi-value	p-value
Clinical Examination	64.28%	0.67	0.001
CT	75%		

Table 9. Accuracy of clinical examination versus CT

Diagnostic Aid	Accuracy	chi-value	p-value
Clinical Examination	62.50%	1.6	0.001
CT	77.50%		

DISCUSSION

Pre-treatment assessment of lymph node metastases is important for therapy and prognosis of patients with carcinoma of the oral cavity. Any modality that detects metastatic nodes accurately would have a great impact on the management of such patients.⁹ Sensitivity of clinical examination was found to be 41.17%, whereas in previous studies it is reported between 48.7% to 86%.¹⁰⁻¹⁵ Specificity of clinical examination was found out to be 78.42% whereas in previous studies it is reported between 70% to 96.7%.¹³⁻¹⁶ The positive predictive value (PPV) of clinical examination was found out to be 58.33% which was lower when compared to the previous studies values i.e. 74-79.2%.¹⁴⁻¹⁶ The negative predictive value for clinical examination was found out to be 64.28%

whereas in previous studies it ranged between 63.63% to 84.1%.¹⁴⁻¹⁶ The accuracy of the clinical palpation was found out to be 62.5% which was low when compared to the previous studies values ranged between 68 to 85%.¹⁴⁻¹⁶ The sensitivity of CT was found out to be 68.42% whereas in previous studies it is reported between 52.5 to 93%.¹⁰⁻¹⁶ The specificity of CT was found out to be 78.26% whereas previous studies reported values ranging from 81 to 100%.¹²⁻¹⁸ The present study revealed PPV of CT as 72.2% whereas previous studies reported 53.1 to 92.3%.¹⁰⁻¹⁸ The present study revealed PPV of CT as 75% compared to previous studies that showed values from 75 to 94%.¹⁴⁻¹⁸ The present study showed an overall accuracy for CT as 77.5%, whereas previous studies reported 75.3 to 90%.¹²⁻¹⁹ Among 18 true positives detected by CT, 8 cases were based on size criteria (>1.5cm), 5 were based on grouping of lymph nodes in one drainage area, 3 were having central nodal necrosis and 2 with peripheral rim enhancing node. Central nodal necrosis and peripheral rim enhancement seems to be most accurate as it gave a specificity of 100%. CT was able to correctly evaluate 6 cases (21.42%) which were clinically not detectable.

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Comprehensive Knowledge on Dental Management of HIV/AIDS: A Survey on Private Sector Oral Health Care Providers in Andhra Pradesh

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ABSTRACT

Background: In India capacity building and training in HIV/AIDS has been focused on doctors, nurses, and counsellors. Oral healthcare providers namely, dentists, dental assistants and nursing assistants have been marginalized. Dentists form the first source of healthcare contact to many HIV/AIDS patients for complaints of oral lesions, with absolutely no knowledge of their patients HIV status. As there is a lack of data on oral health care providers and HIV/AIDS in India, ARUN took the initiative to address this issue and collect data that can prove invaluable in designing future programs and policies.

Methodology: The sampling technique used for the assessment is simple random sampling. The survey was carried out in dental colleges and private clinics and trust hospitals both in the rural and urban settings. A total of 75 dental health care providers from 5 dental colleges and 12 private clinics participated in the survey. The tool was a self administered questionnaire. MS Excel was used for recording the findings. Data analysis was done using SPSS software.

Results: None of the oral health care providers are referring the patients to HIV testing centres in government hospitals. 67% are referring the patients for HIV testing to labs in private sector. 32% of the dentists are referring patients for HIV testing based on the clinical manifestations, 23% as a routine, 8% based on risk behaviour, and 37% of dentists are not at all referring for HIV testing. Only 20% oral health care providers were aware of oral manifestations of HIV/AIDS, 56% of them are not sterilizing the instruments after each use, 61% of them are disinfecting the impressions before sending to the dental laboratory, only 61% dentists are following Universal safety precautions, 94% are not aware of PEP. **Conclusion:** Approximately 10776 patients seeking oral health care in 20 private dental colleges and hospitals can be presented with potential HIV infection and approximately 2000 dentists need to be trained every year. Involving dentists would help in early detection and reducing the HIV epidemic.

INTRODUCTION

India has a population of one billion, around half of whom are adults in the sexually active age group. Since the detection of the first AIDS case in India, in 1986; the total number of People Living with HIV/AIDS (PLHA) in India in 2007 is estimated to be

2.31 million. Females constitute around 39% of the burden. Children below 15 years constitute 3.5% of the estimated number of PLHA while elderly people with age greater than 49 years constitute 7.8%. Adults aged 15-49 years constitute 88.7% of the estimated number of PLHA¹. Highest numbers of PLHA are in Andhra Pradesh and Maharashtra, with nearly half-a-million PLHA each¹.

Several studies have demonstrated the negative impact of HIV infection on oral health. Approximately 40-50% of HIV-positive persons have oral fungal, bacterial, or viral infections that occur early in the course of the disease². Oral lesions in HIV-infected

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Individuals serve as an early indicator of the immunosuppressive condition. Oral lesions strongly associated with HIV infection include Pseudo membranous candidiasis, Erythematous or atrophic candidiasis, Hyperplastic or chronic candidiasis, Angular cheilitis, Herpetic Gingivostomatitis, Hairy Leukoplakia, Oral warts, Acute Necrotizing ulcerative gingivitis/periodontitis, Kaposi's Sarcoma, Non Hodgkin's Lymphoma and Oral Ulcers^{3,4,5}.

WHO outlined some basic principles for developing a country-specific approach to capacity-building to control HIV/AIDS-related oral disease^{7,8}. four areas were identified: (1) health promotion and health education, (2) patient care, (3) infection control, and (4) epidemiology and surveillance. WHO Oral Health Programme recommends encouraging oral health personnel and public health practitioners to make oral health status, an integral part of optimum case management and of surveillance activities of the diseases associated with HIV infection⁶. In India, dental care scenario is unique, at present there are more than 267 dental schools, producing approximately 19,000 dental graduates/year and almost 3000 specialists/year⁶. Assessment of the knowledge levels of the Oral health care providers is considered important for treatment of oral manifestations of HIV/AIDS, as it would help in identifying the levels of competence, training needs and preferences of Oral health care providers.

METHODS & MATERIALS

Association for Rural and Urban Needy (ARUN) is a non-government organization established in 1995 with an objective of promoting the health awareness among the underserved people with an emphasis on HIV/AIDS across Andhra Pradesh. ARUN undertook this study on oral health care providers with the following objectives: (i) To assess the levels of knowledge of Oral Health care Providers on oral manifestations of HIV infection; (ii) To assess the knowledge of oral health care providers on HIV testing; (iii) To assess the expected outcome in terms of the level of competence that Dental Health care provider need; (iv) To assess the knowledge of oral health care providers on universal safety precautions. The survey was carried out in the Dental colleges, private clinics and Trust hospitals located across four districts (Nalgonda, Medak, Nellore and Khammam) in the State of Andhra Pradesh.

DATA

A semi structured questionnaire was developed specially after consultations among trained investigators from ARUN. The self-administered

questionnaire attempted to capture both qualitative and quantitative data and was field tested by experienced investigators. The questionnaire was circulated to all the departments within dental college and in private hospitals. A total of 75 oral health care providers were chosen by convenience sampling to participate in the survey. The respondents asked to fill up the self administered questionnaire based on their observations and clinical experience. The questionnaire was based on ten different parameters capturing the information pertaining to objectives framed. In addition, secondary data was derived from the additional information collected from the medical records of the hospital with in the dental college. The data was entered on MS Excel and was analysed using SPSS version software.

RESULTS

1. Typical/Special cases:

Among the commonly treated typical or special cases in a dental hospital 33% of cases are Impaction cases, 31% are flap surgeries, 16% are Space infections, 15% are Trismus and 5% are of various carcinomas.

2. Universal safety precautions:

Procedure	% adopting
Providing Glass tumblers to patients for rinsing mouth during surgical procedures	61
Changing glass tumblers after each procedure	10
Wearing Gloves	97
Changing Gloves after each procedure	45
Wore masks	98
Changed masks after each procedure	88
Used Drapes	94
Changed drapes after each procedure	62
Wearing of Aprons	100
Changed Aprons after each procedure	7
Used rubber dams	18
Changed rubber dams for each patient	8

Among oral health care providers surveyed, 61% of dentists were using Glass tumblers for patients to rinse their mouths, while doing surgical procedures; only 10% of oral health providers who are providing glass tumblers to patients are changing the tumblers after each procedure. About 98% of dentists wore gloves while performing surgeries and only 88% of them were changing the gloves after each surgery. 97% of oral health care providers surveyed wore mouth masks while performing surgeries, but only 45% of them changed their mouth masks after each surgery. All the dentists wore Aprons during treatment

procedures (Simple clinical examination and while performing surgeries) but where as mere 7% of them are changing their Aprons after finishing each treatment procedures. 94% of dentists are placing drapes on the patients while performing the treatment but whereas only 62% of them are changing drapes from patient to patient. 18% of dentists are using Rubber dams while carrying out treatment, but only 8% of them are changing the Rubber dams from patient to patient.

3. Risky surgical procedures

Among the surveyed dentists, 67% of dentists felt that various dental extraction procedures have maximum risk of occupational injuries and exposure to HIV infection, 28% of dentists felt, Flap surgeries have the maximum risk and 5% of dentists felt that Root Canal Therapy (RCT) have maximum amount of risk of occupational exposure.

4. HIV Oral Indicators

The percentage of oral health care providers who are aware of the oral manifestations of HIV/AIDS working within surveyed hospitals illustrated that, 20% of oral health care providers are of aware of Oral Candidiasis, 18% are aware of Angular Chelitis, 7% are aware of Leukoplakia, 4% are aware of Shingles, 8% are aware of Herpetic Stomatitis, 1% are aware of Kaposi's Sarcoma, 2% of them are aware of Non Hodgkin's Lymphoma, 8% are aware of Acute Necrotizing Ulcerative Gingivitis/Linear Gingival Erythema, 8% are aware of Necrotizing Ulcerative Periodontitis, 14% are aware of Recurrent Aphthous Ulcers and 11% know about Xerostomia.



Graph 1: Incidence of HIV oral indicator

5. Referral for HIV Testing

The percent of patients having any one of the oral manifestations of HIV/AIDS being referred to HIV testing by the oral health care providers from the Out Patient Department in various health care settings are 16.3% from Dental Colleges and Hospitals, 1.2% from Private Clinics and 9.2% from Trust hospitals.



Graph 2: Referrals made from various health care settings for HIV testing

6. Reason for the Referral:

The survey results illustrated 37% of the dentists are not referring the patients for HIV testing. Among the dentists who are referring (63%) for HIV testing, only 32% are referring based on clinical diagnosis of oral manifestations of HIV/AIDS, 23% of them are referring as a precautionary measure, 8% of them are referring after assessing their attitude and behaviour.

7. Place of Referral for HIV testing

None of the dentists are referring the patients to HIV testing centres [Integrated Counselling and testing Centres (ICTC)] run by the local government agency. 67% of them are referring to private health care facilities for HIV testing.

8. Sterilization

The analysis of the data on the practices of the sterilization of the used instruments followed by Oral Health care providers illustrated, 56% of them are not sterilizing the hand pieces after each use, 61% of them are disinfecting the impressions before sending to the laboratory, 53% of them are not using sterilization wrappings, 85% of them are not using the sterilized rubber dams, 25% of them are not sterilizing the burs after each use, only 1% of them are not using the disposable syringes and 13% of them are not changing the saliva ejectors after every use and 94% of dentists are unaware of Post Exposure Prophylactic drugs (PEP).

Details	% of Oral health care providers
Not sterilizing instruments	56
% using sterilized wrappings for impressions	61
Disinfecting wrappings	53
Not using sterilised of rubber dams	85
% using disposable syringes	99
Not using sterilised burs	25

DISCUSSION

HIV-related oral conditions occur in a large proportion of patients suffering with HIV/AIDS, oral manifestations may suggest possible HIV infection, although they are not diagnostic of infection. Dental expertise is necessary for proper dental management of complications in HIV/AIDS.

In this study practice of wearing gloves during performing surgical procedures as well as routine clinical examination to prevent the transmission of infection to patients and to prevent the contact of the health care worker with blood and saliva, is reported to be 97% which is overwhelming but only 45% of dentists who are using gloves have reported that they changed gloves for each patient. This is higher than what was reported by previous studies¹³. Though wearing of protective gloves does not protect from the injuries caused during handling of the sharp equipment, but may confer some protection by virtue of their wiping action on the sharp object on penetration¹⁴.

In this study, 88 percent of dentists wore and changed masks during treatment in between each treatment procedure, in comparison to 54.5% in Jordan⁹ 75% in Kuwait¹⁵, 64.8% in New Zealand,¹³ 74.8% in Canada.¹² It is observed that 87% of dentists are changing saliva ejectors, 75% of dentists changed burs and extraction instruments between patients. There have been reports of previous studies about the transmission of infection as a result of inadequate sterilization of handpieces^{16,17}.

Only 44% of dentists sterilized hand pieces in contrast to other studies that found higher rates of sterilization^{15,10}. The reason for not sterilizing the instruments was false impression regarding autoclaving as it would cause damage to the equipments. This agrees with the findings of a previous study¹⁸. Contamination of the laboratory could occur if cross-infection control is neglected. Indeed, occupational infection of dental laboratory technicians with HBV has been reported¹⁹. The results of this study revealed that as low as 39% of dentists used disinfectants for impressions before sending to dental laboratories. This is in comparison to 18% in Jordan⁹ and 53.7% reported by study done in Durban²⁰. The use of rubber dam, in addition to improving safety and saliva control, significantly reduces bacterial contamination of the atmosphere during restorative procedures, particularly in the vicinity of the operator and dental assistant²¹. The results of this study revealed that only 15% of the oral health care providers participated in survey used rubber dams in their restorative procedures, compared to 13.6% among the

private providers in Jordan⁹ and 40% among private dentists in Durban²⁰.

CONCLUSION

Form the data generated through this study illustrated a considerable amount of oral health care providers are (i) Unaware of the national program on HIV/AIDS; (ii) Have very low levels of knowledge on Clinical manifestation of HIV and their importance. (iii) Have less understanding on Universal safety precautions that can avoid the occupational exposure; (iv) Low level of the knowledge on HIV testing procedures purpose and place of referral; (v) Have low levels of knowledge on Infection control and Waste management; (vi) Low level of understanding on Post Exposure Prophylaxis (PEP).

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Intraoral Periapical Radiographic Changes of Teeth and Jaw Bones in Chronic Renal Failure Patients - an Observational Case-Control Study

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ABSTRACT

Background: Chronic renal failure is an important health care problem throughout the world, with a prevalence of 7852 cases per million population (p.m.p) in India. Patients afflicted by this medical condition can visit a general dentist's office with number of clinical as well radiological manifestations. This study is undertaken to observe the soft radiologic changes occurring in teeth and jaw bones through Intraoral Periapical Radiographs (IOPA) which could be warning signs for undiagnosed kidney disease in these patients.

Methods: IOPA radiographs of 30 patients present in the initial stage of chronic renal failure (CRF) and have not undergone dialysis and 30 control group were taken in to the study. Maxillofacial radiologists measured the changes in the morphological features of the lamina dura, trabecular pattern, pulp size and radiographic density presenting in the teeth and jaw bones.

Results: In patients with CRF the significant changes were observed in lamina dura in the maxilla (93.3% of cases and 43.3% in controls; $p < 0.0001$) as well as mandible (83.3% of case and 33.3% of controls; $p < 0.0001$) when compared with controls. Changes in the trabecular pattern of both maxilla (86.6% of cases and 43.3% of controls; $p < 0.001$) and mandible (86.6% in cases and 10% in controls; $p < 0.0001$) were very evident in the case group when compared with controls. The radiographic density in case group showed significant change in maxilla (93.3% in cases & 20% in controls; $p < 0.0001$) when compared to controls but interestingly negligible change was seen in mandible of both case and control groups (40% in cases and 23.3% of controls; $p = 0.1647$). No significant change was observed in size of pulp chamber in both maxilla (86.6% in patients and 70% in controls; $p = 0.117$) and mandible (63.3% in patients and 30% in controls; $p = 0.0096$) in both case and control groups.

Conclusions: The results suggest that changes IOPA radiographic changes in Lamina dura, trabecular pattern and overall radiographic density can be a good prognostic tool for assessment and management CRF patients.

Key words: IOPA, Lamina dura, Trabecular pattern, Radiographic density, Pulp chamber

INTRODUCTION

A patient's renal reserve or the capacity for structural and functional hypertrophy of surviving nephrons, can compensate to a point at which less than 50% of renal function remains. Once the damage is past

the point of compensation, patients will begin to experience the signs and symptoms of chronic renal insufficiency (CRI) and, if left untreated, will progress to a state of chronic renal failure (CRF). Ultimately, such patients develop end-stage renal disease (ESRD). Oral cavity provides the reflection of the systemic state of whole body. Each disease has its unique oral manifestations; In case of renal failure, 90% of all affected patients experience oral symptoms¹ affecting both the bone and soft tissue structures². Commonly noted signs and symptoms include Halitosis and metallic taste due to increased concentration of urea in saliva and its posterior transformation into ammonium, Xerostomia,^{1,3,4} paleness of the mucosal membranes due to anemia,^{1,2,3,5} Uremic stomatitis,

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Gingival bleeding^{2,6}, Petechiae and Ecchymosis² resulting from platelet dysfunction^{6,7} and the effects of anticoagulants⁷, Gingival hyperplasia secondary to drug treatment⁹, which in turn is aggravated by the deficient oral hygiene^{3, 9, 10}. Periodontal problems include loss of periodontal ligaments, and formation of deep pockets^{11, 12}, Enamel hypoplasia secondary to alterations in calcium and phosphorus metabolism², which can affect both the primary and permanent dentition⁸. Severe erosions on the lingual surfaces of the teeth may occur due to frequent regurgitation and vomiting induced by uremia medication, and nausea associated to dialysis^{1, 7}. Pulp obliteration², possibly related to the alterations in calcium and phosphorus metabolism, Delays or alterations in eruption^{1, 2}. Changes in maxillary bone, secondary to renal osteodystrophy^{1, 7} comprising bone demineralization with trabeculation and cortical loss^{1, 2, 5, 7}, giant cell radio transparencies or metastatic calcifications of the soft tissues¹. The patients are also probably at increased risk of fracture during dental treatments such as extractions^{1, 5}, tooth mobility^{1, 7, 8}, malocclusion, crowding, pulp chamber calcifications¹ and temporomandibular joint problems are also observed¹³. Candidiasis is common among both transplant patients and subjects on dialysis^{5, 8}. Cytomegalovirus (CMV) infection is frequent in the first months after transplantation², Oral hairy leukoplakia (OHL) secondary to drug-induced immune suppression⁸, virus-related tumors such as Kaposi's sarcoma⁸ or non-Hodgkin lymphoma^{8, 9}. Skeletal changes resulting from chronic renal disease are collectively called renal osteodystrophy. It is widely accepted that acquired disturbance of the utilisation of vitamin D in both the intestines and bone tissue in chronic renal insufficiency results in hypocalcaemia and secondary hyperparathyroidism. In the roentgenogram the trabeculae of the spongy bone are not well defined and the density of the bone is generally decreased. Soft Radiographic alterations of the jaw bones in chronic renal disease are not uncommon and often represent as partial or complete loss of the lamina dura, thinning of the cortical plates, with the blurring of anatomic landmarks. In addition, trabecular pattern of the affected bone often assumes a ground-glass or salt and-pepper appearance¹⁶. As per the recent study the prevalence of CRF in India is 7852 cases per million population (p.m.p).¹⁵ Considering the above background, this study is performed to examine the radiological changes of teeth and jaw bones in renal failure patients who are not undergoing dialysis.

OBJECTIVES OF THE STUDY

As a dental practitioner it is necessary to have a thorough understanding of special treatment considerations to be performed which can be effective and safe to these systemically compromised patients.

- To determine Intra Oral Peri Apical Radiograph (IOPA) changes in patients diagnosed with CRF who have not undergone dialysis.
- IOPA radiograph as an aid in assessing and predicting the prognosis of CRF.

METHODS AND MATERIALS

This is observational, case-control study and was conducted in the wing of Oral Medicine and Radiology at A.V. Super Specialty Dental Hospital. The study group was formed of 30 patients with moderate-severe CRF: 22 men and 08 women; mean age = 64 ± 11 years; mean weight = 74.78 ± 4.60 kg; 42% had primary education, 37% secondary education and 21% higher education. The 30 controls presented similar characteristics with regard to sex (25 men and 5 women), age (mean age = 60 ± 11 years), weight (mean weight = 75.50 ± 4.94 kg) and educational level (38% had primary education, 35% secondary education and 27% higher education) and with no major systemic diseases. All the patients were drawn from outpatient department of A.V. Super Specialty Hospital, Hyderabad. Two Maxillofacial Radiologists performed the interpretation of IOPA radiographs.

RADIOGRAPHIC EXAMINATION OF PATIENT

The selected sample were examined and subjected for clinical evaluation. The patient was made to sit comfortably on the physiological dental chair with artificial illumination. Detailed clinical history was noted followed by radiographic evaluation with the help of I.O.P.A.R in relation to 26, 27, 28 & 46, 47, 48.

MATERIALS

1. CCX Digital Trophy Trex Group – X-ray machine with specifications of 70 KVP, 8 mA, 0.16x/secs (Electronic x-ray timer), provided with a chair which could be elevated or brought down to adjust the vertical height.
2. IOPA Films- No. 2 (31 x 41 mm) (Kodak Dental Intra Oral E-Speed Film, Eastman Kodak Company, New York). No.0 (22 x 35 mm) (Kodak insight Super Polysoft Film, Eastman Kodak Company)
3. Lead apron, Sterile gloves, White adhesive plaster (Johnson and Johnson India Ltd)

EXPOSURE OF IOPA RADIOGRAPHS

Patient was positioned upright in the chair with the back and head well supported. Positioned the dental chair low for maxillary and elevated for mandibular projections. Patient was draped by lead apron, where the x-ray unit is of 70 KVp, 8mA with the normal exposure time, then place the KODAK ,

E-Speed intra oral film of size 31x41mm, using snap-A- Ray intra oral film holder using Bisecting angle technique, where the position of film as close as possible to the lingual surface of the teeth, resting in the palate for maxillary with the horizontal angulation is at right angles to the buccal surfaces of teeth and vertical angulation of +20 degrees & in the floor of mouth for mandibular with the angulation of -5 degrees.

INTERPRETATION OF RADIOGRAPHS

After exposure the films were processed in the dark room by manual visual processing method The processed and dried film was labelled and stored in a separate cover. The interpretation of IOPA radiographs was done in the dark room using radiographic view box and magnifying lens. The IOPA radiograph was mounted on the radiographic view box and criteria for Radiographic evaluation.

The results obtained in the present study were analysed using the SPSS version 16.0 statistical package for Windows. Chi-squared test were used to study the variables. Statistical significance was taken as a value of p<0.05. Odds ratio with 95% confidence interval was also calculated.

RESULTS

Of the 30 patients in the study group, 22 (73%) were in the initial stages of CRF and 08 (27%) were suffering moderate CRF and all the patients in the study group have not undergone for dialysis and were on pharmacological-dietary treatment. The following variables are presented for Maxillary bone changes in Table 1 and mandibular bone changes in Table 2 both for the patients and for the controls: the lamina dura in the maxillary bone showed changes in 93.3% of case

group where as 43.3% in control group, showing a tendency of statistical significance (p=<.0001). The changes were assessed in terms of entire lamina dura thickening or thinning completely or partially and its presence or absence. It is observed that in 33.3% of patients lamina dura was completely absent where as in controls it is only 3.3%. Significant change was observed in thinning of lamina dura in cases (60%) and in controls it was 26.6%. Similar changes were observed in the lamina dura of the mandible, 83.3% of the patients showed changes where as 33.3% of controls showed changes giving a tendency of statistical significance (p=0.0001). 86.6% of cases and 43.3% of controls showed changes in the pattern of trabeculation of maxilla providing the statistical significance (p=<0.001). Similar results were observed in mandibule (86.6% in cases and 10% in controls ; p=<0.0001). In maxilla 93.3% of patients showed changes in the radiographic density where as in controls only 20% have shown changes giving a statistical significance (p=<0.0001). But in case of mandibule, both controls and cases have shown less amount of changes in the overall radiographic density giving to statistical significance(40% in cases and 23.3% of controls; p=0.1647). No significant difference was observed regarding the changes in pulp chamber (relative to age) of the maxilla in both cases and controls with no statistical significance (86.6% in patients and 70% in controls; p=0.117), Where as in case of mandible slight difference was observed in the pulp chamber when compared to maxilla. 63.3% of cases showed changes but whereas controls are 30%, giving no statistical significance (p= 0.0096). In case of changes in thickness of the lower border of the mandible significant changes were observed (73.3% of cases and 20% of controls) giving a statistical significance(p=<0.0001).

Table 1. Table 2. Comparison of Radiographic changes in the Maxilla of Case group (n=30) and Control group (n=30)

	Maxilla			
	Cases (CRF patients) n (%)	Control n (%)	Odds ratio	Statistical significance
Changes in Lamina Dura				
Yes	28 (93.3)	13 (43.3)	18.3077	p=<.0001
No	2 (6.6)	17 (56.6)		
Changes in Trabecular pattern				
Yes	26 (86.6)	4 (13.3)	42.25	p=<.0001
No	4 (13.3)	26 (86.6)		
Changes in overall radiographic density				
Yes	28 (93.3)	6 (20)	56	p=<.0001
No	2 (6.6)	24 (80)		
Changes in pulp chamber (relative to age)				
Yes	26 (86.6)	21 (70)	2.785	p=0.117
No	4 (13.3)	9 (30)		

Table 2. Comparison of Radiographic changes in the Mandible of Case group (n=30) and Control group (n=30):

	Mandible			
	Cases (CRF patients) n (%)	Control n (%)	Odds ratio	Statistical significance
Changes in Lamina Dura				
Yes	25 (83.3)	10 (33.3)	10	p=<.0001
No	5 (16.6)	20 (66.6)		
Changes in Trabecular pattern				
Yes	26 (86.6)	3(10)	58.5	p=<.0001
No	4 (13.3)	27 (90)		
Changes in overall radiographic density				
Yes	12 (40)	7 (23.3)	2.1905	p=0.1647
No	18 (60)	23 (76.6)		
Changes in pulp chamber (relative to age)				
Yes	19 (63.3)	9 (30)	4.03	p=0.0096
No	11 (36.6)	21 (70)		
Changes in thickness of lower border of mandible				
Yes	22 (73.3)	6 (20)	11	p=<.0001
No	8 (26.6)	24 (80)		

DISCUSSION

Chronic renal failure alters bone metabolism by multiple mechanisms. Pathognomic radiologic findings include the loss of the dental lamina, thinning of cortical bone in multiple locations, a coarsened trabecular pattern, and a "salt-and-pepper" appearance of bone, particularly the skull.^{18,19,20} In this study, loss of Lamina dura was observed significantly in both the jaws in cases and negligible loss in control group, the reason can be nonspecific instead of hyper/hypoparathyroidism, as suggested in other studies^{21,22}. This study correlates with the findings of study conducted by Indiana University Medical Center; Indianapolis, USA that states that the triad of changes in lamina dura, trabecular pattern, and bone density alteration, although variable in relative appearance, frequently appear together²³. The findings of this study find similarities with the findings of Veterans Administration Medical Center, Wood, Wis., USA in terms of delicate or absent trabecular patterns.²² The study also illustrated that changes in the size of pulp chamber in both the jaws in control as well as cases has no statistical significance and cannot be taken as diagnostic marker of the renal failure. This study also correlates with the overall granular or chalky white appearance associated with an increase in radiographic density as one of the most common alterations²².

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Non-Carious Cervical Lesion-A Multifactorial Etiology Case Report

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Abstract

Non-carious cervical lesions (NCCL) of teeth have been documented in the literature and there are many cases with regard to every single type including attrition, abrasion, erosion, and abfraction. But very cases have been documented where all these lesions co exist and it is difficult to say which the causative lesion is and which other lesion causes the progression. This is a unique case where the causative factors and the etiology are dubious and vague patient history. The clinical findings, differential diagnosis, final diagnosis and the prognosis are discussed. Also the treatment of such lesions is important.

INTRODUCTION

A non-carious cervical lesion (NCCL) is the loss of hard dental tissue on the neck of the tooth, most frequently located in the vestibular plane. Causal agents are diverse and mutually interrelated. The causes of tooth surface lesions proposed are classified as attrition, abrasion, erosion and abfraction.

Attrition is the physiological wearing away of a tooth as a result of tooth to tooth contact.

Abrasion is the pathological wearing away of a tooth substance through some abnormal mechanical process.

Erosion is the loss of dental hard tissue by a chemical process that does not involve bacteria.

Abfraction is the pathological loss of both enamel and dentin caused by biomechanical loading forces.

Clinically it is seen that these factors often act concomitantly resulting in loss of tooth structure in the cervical region of teeth. A case report is presented where the etiology is multifactorial. The history is inconclusive making it difficult to pinpoint single causative agents. Treatment and preventive options are also discussed.

CASE REPORT

A patient had come to the hospital with a complaint of brown color tooth lesions in the cervical third of tooth. Patient noticed this 6-8months before she reported. The patient did not give a proper history of her oral hygiene, eating or other habits and hence the etiology was elusive.

Clinically the condition cannot be categorized into any of the afore mentioned conditions and it becomes apparent that the three physical and chemical mechanisms are jointly involved in the etiology of this lesion.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis which gives primacy to a single mechanism fails because they miss the multifactorial nature of this lesion. No single mechanism is adequate to explain all occurrences of NCCLs', their etiology likely is multifactorial in nature. A combination of all these factors is responsible to varying degrees. It has not been clearly identified as to whether any one process is more responsible for lesion initiation or for progression or vice-versa. Initiation of breakdown by one process can make the tooth more susceptible to damage by the other processes, perhaps in a synergistic manner. One factor may predominate over another in a given patient, leading to the varied presentations.

TREATMENT

Decision to restore NCCL's is based on the desire to strengthen the tooth and decrease the theoretical stress concentration and flexure, mitigate lesion progression, prevent hypersensitivity and pulp involvement, improve oral hygiene, and enhance esthetics. Treatment measures have included resin based composites, glass ionomers or a combination of the techniques. Other treatment options include metal restorations for posterior teeth, dentin bonding agents and copal varnishes, fluoride therapy and desensitizing agents, night guard and occlusal adjustments, dietary modifications and oral habit cessation.

In this case the teeth were restored with composite resins as the lesion was in the cervical third of the teeth involving enamel.

CONCLUSION

Though non-carious cervical lesion (NCCL) are common in dental practice, cases where these lesions exist concomitantly are rare and when the practitioner encounters such cases he should be astute to diagnose the case, document all the findings and establish a definitive treatment plan. As the etiology and the causative lesion was dubious in this case the dentist must be wise enough in considering all the factors that can cause NCCL and come to a proper diagnosis considering all the other NCCL in the differential diagnosis.

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A study of Epidemiology of Rabies at Government Medical College and Hospital, Aurangabad

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ABSTRACT.

Background: Human rabies despite advances in medical sciences still remains practically a cent percent fatal disease.

Methods: We reviewed the surveillance data of Rabies cases over a period of 5 years (Jan 2000 – Dec 2004) and also cross sectional study was carried during the period from 1st January 2005 to 31st December 2005 at Government Medical College Hospital, Aurangabad, Maharashtra to study the factors associated with rabies and also the traditional customs, misbelieves and indigenous treatments associated with rabies.

Results: Total 153 cases were noted during the study period out of which 31 cases were found during cross sectional study. The most vulnerable age group for rabies cases was 15-45 years (38.56%), 48.38% received indigenous treatment and 41.93% took some form of wound treatment.

Conclusion: Implementation of effective canine rabies control activities by use of anti – rabies vaccine for animals, effective control of stray dog population and complete vaccination schedule in case of animal bite are necessary.

Key words: Rabies, Anti-rabies vaccines, Vaccination

Conflict of Interest: None

Source of Disclosure: No.

INTRODUCTION

Rabies is a natural infection of dogs, foxes, cats, wolves and bats. Man is infected by the bite of rabid dog or other animals¹. Rabies is simply the Latin word for madness². In the first century AD the Roman scholar Aulus Cornelius Celsus was perhaps the first to provide an accurate description of the disease with a wide range of species susceptible to infection³.

Australia, China (Taiwan), Cyprus, Iceland, Ireland, Japan, Malta, New Zealand, the UK, Islands of Western Pacific, Liberian Peninsula, Norway and Sweden are

all rabies free. In India, the Islands of Lakshadweep, Andaman and Nicobar are rabies free⁴.

Globally 40000 to 70000 deaths occur in a year. In India approximately 7.4 million people are bitten by animals. In India, pet dog population is around 28 million. Pet dog: Man ratio is 1:36. Annual man days lost to animal bite is 38 million⁵. It is estimated that about 18,000 to 20,000 cases of human rabies occur annually in India⁶. Hence rabies is one of the important public health problems in India.

It is a common practice in our country to apply various materials/ substance over the wounds caused by animal bites. The commonly used materials/ substance are turmeric(with or without oil), chili powder, flour paste, plant seeds, plants sap, calcium carbonate with copper coin, tea powder etc. It is also observed that patients seek treatment from quacks and endanger their lives⁷.

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In the present study we endeavor to study epidemiology and factors associated with development of rabies in patients admitted to Government Medical College Hospital, Aurangabad. Further we intend to study the traditional customs, misbeliefs and indigenous treatments for rabies.

AIMS AND OBJECTIVES

1. To study the epidemiology of rabies cases admitted in Government Medical College Hospital, Aurangabad.
2. To identify the factors associated with development of rabies.
3. To study the traditional customs, misbeliefs and indigenous treatments associated with rabies.

MATERIALS AND METHODS

The present hospital based cross sectional study was carried at Government Medical College Hospital, Aurangabad during the period from 1st January 2005 to 31st December 2005. Present study is an epidemiological profile of rabies cases admitted in isolation ward of Government Medical College and hospital, Aurangabad through information received from admitted patients/attainder and available records of patients admitted from 1st January 2000 to 31st December 2004.

All clinical diagnosed cases of rabies were admitted in this hospital during the study period were included in this study. Detailed history of each case was taken and clinical examination was carried out as soon as the patient is admitted.

The data was collected during 1st January 2005 to 31st December 2005 during office hours from Record Section. Home visit was done to all the patients home, who were admitted to Government Medical College Hospital, Aurangabad during 1st January 2005 to 31st December 2005.

The pretested questionnaire was used for interview.

STATISTICAL ANALYTICAL METHODS

Chi – square was used whenever applicable.

REFERENCE CITING

Vancouver system of listing and citing of references is used.

OBSERVATIONS AND DISCUSSION

Present study was carried out to study epidemiology, factors associated with development and the traditional customs, misbeliefs and indigenous treatment by quacks for animal bite in rabies for a period of one year from 1st January 2005 to 31st December 2005. Also records of clinically diagnosed cases of rabies, admitted in isolation ward of Government Medical College and Hospital, Aurangabad from 1st January 2000 to 31st December, 2004 were analyzed.

The isolation ward of medical college Hospital admits and manages rabies cases.

Total 31 cases of rabies admitted in Government Medical College Hospital, Aurangabad were studied from 1st January 2005 to 31st December 2005.

Also records of 122 cases of rabies admitted at Government Medical College and Hospital, Aurangabad during 1st January 2000 to 31st December 2004 were analyzed.

Table 1. Distribution of Rabies Cases According to Age

Year	Age(Yrs)	No. of cases	Percentage
2000 to	0-5	9	5.88
2004 and	6-14	39	25.49
1 st January	15-45	59	38.56
2005 to	≥ 45	46	30.06
31 st December 2005	Total	153	100

In the year from 1st January 2000 to 31st December 2005 more than 38.56% cases were in the age group above 15-45 years. Mean age is 32.05 years (range 3 to 84 years). In age group of above 45 years, 30.06% cases were seen.

Sarbjit Sehgal et. al (1996) observed that more than 56% victims were in the age group 5-30 years⁸.

DS Dahliwal et.al (2000) observed that majority (39.22%) of cases belonged to the age group of 15-45 years followed by 6-14 years (27.45%) and rest 45 years and above⁹.

Singh J et.al (2001) observed that cases were significantly higher in 5-14 years old than in other age group¹⁰.

Table 2. Distribution Of Cases According Tto Economic Status (During 1st January 2005 to 31st December 2005)

(BG Prasad Classification)

Social class	Per capita income p.m.	Urban cases	Rural cases	Total cases
I	2607& above	0	3	3(9.67%)
II	1303 – 2606	5	8	13(41.93%
III	782 – 1302	1	8	9(29.03%)
IV	391 – 781	1	2	3(9.67%)
V	Below 391	1	2	3(9.67%)
	Total	8(25.8%)	23(74.19%)	31(100.0%)

Table – 2 displayed social class grading as per per–capita income by BG Prasad¹¹.

It is also clear that 41.93% cases belong to socio – economic class – II, followed by 29.03% class - III and 9.67% class – I, IV ad V.

Table 3. Distribution of Cases as per Literacy Status (During 1st January 2005 to 31st December 2005)

Sr. No.	Literacy status	No. of cases	Percentage
1	Illiterate	13	41.93
2	Literate	18	58.06
	Total	31	100

It is evident from above table that 58.06% of the total rabies cases were literate while 41.93% were illiterate.

Table 4. Distribution of Cases as per Occupation (During 1st January 2005 to 31st December 2005)

Sr. No.	Occupation	No. of cases	Percentage
1.	Agricultural labour	12	38.70
2.	Farmers	02	6.45
3.	Employed	01	3.22
4.	Own business	04	12.90
5.	House wife	03	9.67
6.	Dependent	05	16.12
7.	Others*	04	12.90
	Total	31	100.00

*Others included (i) Workers in factory, (ii) Private electricians (iii) Fruit sellers and (iv) Beggars.

From table –4, it is clear that 38.7% were agricultural labour while 12.9% were businessmen.

Katke DN stated that students form the most vulnerable category for animal bites (43.7%).¹²

Table 5. Time Lag Between Bite and Starting arv (1st January 2005 to 31st December 2005)

S. No.	Interval(days)	No. of cases	Percentage
1	Within 24 hours	03	16.66
2	1 – 2 days	14	77.77
3	2 – 3 days	1	5.55
	Total	18	100.00

Those who started anti – rabies vaccination following bite of a rabid animal 16.66% took ARV within a day of bite and 77.77% in 1- 2 days. 5.55% cases had taken ARV after 2 – 3 days after bite of animal.

Katke DN observed that 47% cases had reported within 24 hours, 68.5% cases within first 2 days and about 80% cases had reported within 3 days of animal bite.¹²

MK Sudarshan et al observed that those who started an anti-rabies vaccination following bite of a rabid animal 7.6% taken ARV within a day of bite and another 6% in the next 2 to 3 days.¹³

Table 6. Distribution of Cases as per the Nature of Bite (During 1st January 2005 to 31st December 2005)

Nature of bite				
S. N0.	Animal	Provoked	Unprovoked	Total
1	Dog	5	25	30(96.77%)
2	Cat	—	1	1(3.22%)
3	Cow	—	—	—
	Total	5(16.12%)	26(83.87%)	31(100.0%)

It is evident from the above table that cases of provoked bite were 5(16.12%) and of unprovoked bites were 26(83.87%).

Katke DN (1944) had observed that the cases of provoked bite were 25.5% and of unprovoked bites were 74.5%.¹²

Table - 7 Distribution of Cases as per Nature of Wound Treatment Received

1st January 2005 To 31st December 2005

	Wound treatment received	Water	Soap & water	Antiseptic	Wound treatment not received
Urban	3	3	0	0	6
Rural	13	10	3	0	8
Total	16(53.33%)	13	3	0	14(46.66%)

Out of 31 patients, 1 patient of consumption of unboiled milk of cow is excluded from this table. Above table shows that 16 patients (53.33%) out of 30 patients received some form of wound treatment. Out of these 16 patients, 13 patients used water, while 3 patients used soap and water.

Most significant finding is that 14 (46.66%) patients did not receive any sort of wound cleaning.

Katke DN observed that 307 (59.2%) cases out of 519 cases received some form of wound treatment. Out of these 307 cases, 61 (19.9%) cases cleaned wound only with water, 114(37.1%) cases used soap and water, while 132 (43%) cases used some antiseptic. 212 (40.8%) cases did not receive any sort of wound cleaning.¹²

MK Sudarshan et al stated that 39.5% cases used soap and water for cleaning wound.¹³

Table 8. Details of Indigenous Treatment Done

1st January 2005 To 31st December 2005

S. No.	Indigenous treatment	No. of cases	Percentage
1.	Indigenous t/t done	15	48.38
2.	Local application to wound	11	35.48
3.	Application of lime/ lime juice	6	19.35
4.	Application of leaf	3	9.67
5.	Application of turmeric powder	1	3.22
6.	Consulting quacks	1	3.22
7.	Application of tea powder	1	3.22

It is evident from the above table that 15(48.38%) cases received indigenous treatment. 35.48% cases had done local application to wound. In 6(19.35%) cases lime or lime juice was applied to the wound. Lime is a cauterizing agent and thus this is a useful traditional practice. 3(9.67%) cases had applied leaf over wound. Only 1 case (3.22%) had consult quacks. In 3.22% cases, turmeric powder and tea powder was applied over wound.

Katke DN observed that 244 (46%) received traditional local treatment, of these 140 cases had also received traditional treatment orally, most of the times consuming enchanted bhakar,(roti) (99.3%). In 148 cases (60.7%) lime was applied to the wound. Lime was applied and copper coin was fixed to the wound in 70 cases (28.7%). Cauterization was done by red hot iron rod in one case. (0.4%)¹².

MK Sudarshan observed that the most commonly ressautes practices were magico-religious (28.09%) followed by herbal therapy (10.6%)¹³.

DG Sampath observed in case studies that turmeric mixed with oil, some plant recdes, paste made from jowar flour, were applied over wound by a bite of animal⁷.

SUMMARY, CONCLUSION AND RECOMMENDATION

The present hospital based study was carried out in Government Medical College and Hospital, Aurangabad during 1st January 2005 to 31st December 2005. The study was aimed to study the epidemiology, clinical profile, traditional customs, misbelieves and indigenous treatment associated with rabies.

Total 153 cases were reported during the year 1st January 2000 to 31st December 2004 and between 1st January 2005 to 31st December 2005. All these cases were included in the study.

RESULTS OF STUDY WERE AS FOLLOWS:

- 1) 15-45 years (38.56%) was most vulnerable age group for rabies cases and 0 – 5 years (5.88%) were least prone age group for rabies cases.
- 2) 41.93% cases belong to social grade II as per BG Prasad Classification.
- 3) 58.06% of cases were literate.
- 4) Agricultural labour forms the most vulnerable category for rabies cases (38.7%).
- 5) Those who started anti – rabies vaccination following bite of a rabid animal, 77.77% cases had taken ARV in 1- 2 days after bite of animal.
- 6) Dog was the principal animal responsible for the rabies cases. 96.77% of cases were the victims of dog bite.
- 7) Cases of provoked bites were 16.12% and of unprovoked bites were 83.87%.
- 8) Only 18.75% patients received local wound treatment using soap and water.
- 9) Most significant finding is that 14 (46.66%) patients did not receive any sort of wound cleaning.

- 10) 48.38% received some form of indigenous treatment, most of the times 19.35% in the form of application of lime or lime juice, which is useful traditional practice as lime is cauterizing agent. 9.67% cases applied leaf over the wound. 3.33% of cases reported application of turmeric powder and tea powder over the wound.

RECOMMENDATIONS

It is evident from the present study that there are some traditional customs, misbeliefs and indigenous treatment which results in rabies.

Following recommendations are suggested in order to minimize problem of rabies.

- 1) Implementation of effective canine rabies control activities by use of anti – rabies vaccine for animals
- 2) Effective control of stray dog population
- 3) Licensing of pet dogs is the need of the hour.
- 4) Community should be made more aware of the importance of proper local wound treatment and complete vaccination schedule in case of dog bite, through mass media.
- 5) Conduct professional training and public awareness campaign.

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Comparison of Surface Hardness of Two Resin Composites After Exposure to Three Different Staining Agents and Four Different Bleaching Agents-an in vitro Study

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ABSTRACT

Abstract: To compare the surface hardness of two resin composites Esthet_X and filtek supreme after exposure to three different staining agents coffee, tea and red wine and two different dentist prescribed at home bleaching agents colgate platinum & opalescence and one over the counter bleaching agent (Colgate Platinum).

Methodology: 60 specimens, 9mm×2mm each of Filtek Supreme and Esthet-X were prepared. The 60 specimens were divided into 4 groups:

Group 1: coffee group

Group 2: tea group

Group 3: red wine group

Group 4: control group (distilled water)

Results: The results showed that in case of Filtek Supreme a statistically significant difference in surface hardness was noted when subjected to coffee and tea and the tea group when subjected to OTC bleaching agent. In case of Esthet-X, significant difference in surface hardness was observed when subjected to tea and the same tea group when treated with Opalescence 20%.

INTRODUCTION

Currently dentistry is experiencing a trend of increasing demand from patients for superior esthetic restorations. Restorative materials used in dentistry are required to have long term durability in the oral cavity. During the daily clinical practice, tooth colored restorations exist in the teeth that are planned to be bleached. Also, in today's world consumption of beverages and drinks has dramatically increased. Very little is known about the effects of these beverages, drinks and bleaching agents on the physical properties of the composites. Therefore it is important for dentists to understand the effects of bleaching agents on the physical properties of restorative materials¹.

The purpose of this in-vitro study was to quantitatively assess the effects of beverages, drinks, dentist prescribed at-home bleaching agents and OTC agents on the surface hardness of one microhybrid and one nanofilled composites.

MATERIALS AND METHODS

- 3 Staining solutions: coffee, tea and red wine
- 2 composite resins, Filtek supreme (FS) and Esthet-

X (EX).

- 1 OTC bleaching agent, Mirawhite.
- 3 professionally supervised bleaching agents, colgate platinum, Opalescence 10%, ultradent products, USA and opalescence 20%, ultradent products, USA.

PREPARATION OF THE SPECIMEN

9mm × 2mm specimens were prepared using a metal ring.

The 60 specimens of each composite were divided into four groups (n=15):

1. Coffee group
2. Tea group
3. Red wine group
4. Distilled water (Control group)

Each group of both the composites was subjected to one of the three staining solutions. They were kept in staining solutions for three hours a day for 40 days. The specimens were kept in distilled water for the remaining period. The solutions were changed daily. Each day after the staining period the specimens were

washed in distilled water. The control group was not subjected to any staining solution and was kept in distilled water throughout the staining period.

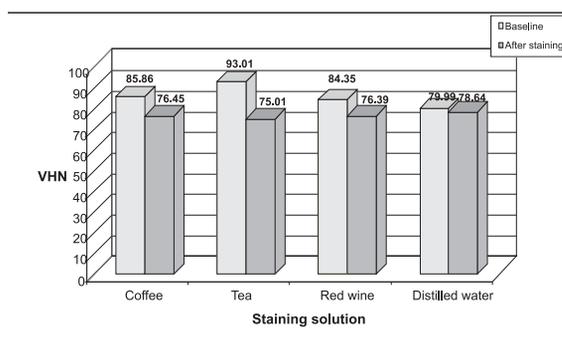
BLEACHING PROCEDURE

Samples were treated with three different bleaching agents. The specimens of coffee group, tea group and red wine group were divided into three groups each (n=5), and were subjected to one of the three bleaching agents. The bleaching agents were applied on to the surface of the specimens. The specimens were subjected to bleaching agent for eight hours a day for 14 days. The specimens were kept in distilled water for remaining period. The control group was not subjected to any bleaching agent.

SURFACE HARDNESS TESTS

Surface hardness tests were performed with Vickers hardness tester. The testing was performed with a 50g load and 20 seconds dwell time. Three values were collected for each specimen and the mean was calculated. Surface hardness tests were performed three times during the study: baseline (24 hours after polymerization), after the 40 day staining period and finally after the 14 day bleaching period.

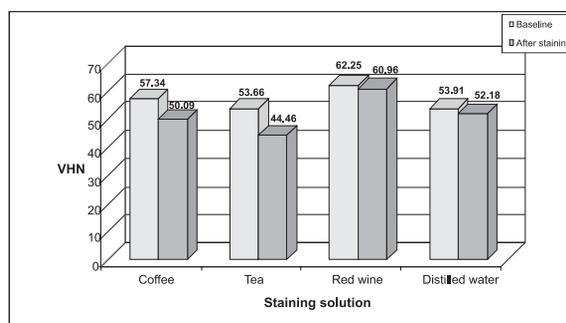
Graph 1: Mean VHN scores of Filtek Supreme at baseline and after staining



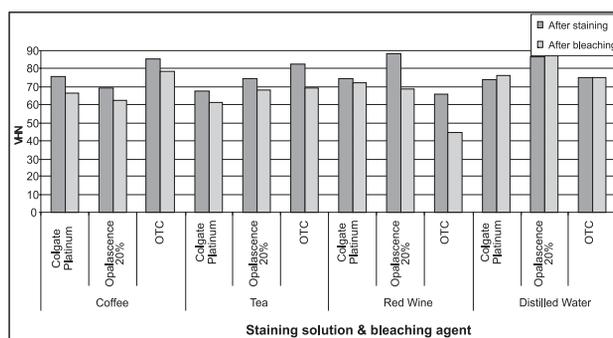
RESULTS

In table 1 it is observed that there is a very high significant difference in the VHN values recorded at baseline and after staining in Filtek Supreme composite when used in coffee and tea solutions ($P < 0.001$). But no significant difference is observed in red wine and distilled water ($P > 0.05$).

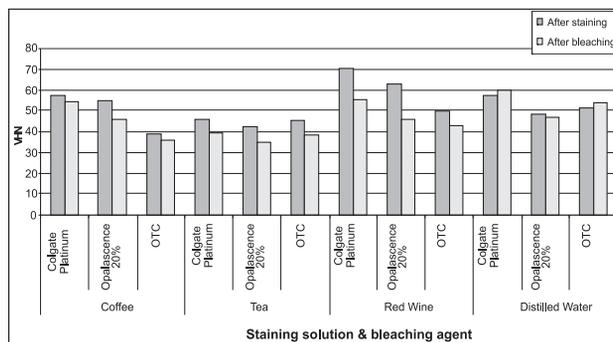
Graph 2: Mean VHN scores of Esthet-X at baseline and after staining



Graph 3: VHN scores of Filtek Supreme after staining and bleaching



Graph 4: Mean VHN scores of Esthet-X after staining & bleaching



In Esthet-X composite significant difference is noticed in the VHN values recorded at baseline and after staining ($P < 0.05$). Very high significant difference is noticed in tea ($P < 0.001$) and no significant difference is noticed in red wine and distilled water ($P > 0.05$).

Table 1. Comparison of VHN scores at baseline and after staining in Filtek Supreme and Esthet-X composites when used in different staining solutions

Composite	Staining solution	Baseline (Mean±SD)	After staining (Mean±SD)	Mean difference	t	P-value
Filtek Supreme	Coffee	85.86±25.34	76.45±22.17	9.415	5.546	<0.001*
	Tea	93.01±27.37	75.01±17.74	18.007	5.863	<0.001*
	Red wine	84.35±22.52	76.39±29.65	7.953	1.416	0.179
	Distilled water	79.99±15.69	78.64±17.39	1.347	1.275	0.223
Esthet-X	Coffee	57.34±15.50	50.09±13.40	7.247	2.906	0.012*
	Tea	53.66±11.25	44.46±9.37	9.200	5.494	<0.001*
	Red wine	62.25±33.06	60.96±19.74	1.293	0.165	0.871
	Distilled water	53.91±12.46	52.18±13.29	1.726	0.676	0.510

*denotes a significant difference

In table 2 it is observed that there is a significant difference between the VHN score recorded after staining & after bleaching in tea with OTC bleaching

agent (P<0.05). But no significant difference is observed in any of the combinations of staining solutions with bleaching agents (P>0.05).

Table 2. Comparison of VHN scores Of Filtek Supreme after staining and after bleaching

Staining solution	Bleaching Agent	After staining (Mean±SD)	After bleaching (Mean±SD)	Mean difference	t	P-value
Coffee	Colgate Platinum	75.56±14.15	66.24±11.98	9.320	1.310	0.260
	Opalescence 20%	69.24±29.93	62.36±29.06	6.880	2.392	0.075
	OTC	85.54±21.83	78.76±21.78	5.780	1.950	0.123
Tea	Colgate Platinum	67.46±16.97	61.10±10.80	6.360	1.576	0.190
	Opalescence 20%	74.78±12.38	67.94±10.69	6.840	2.192	0.093
	OTC	82.78±22.65	69.14±19.65	13.640	3.962	0.017*
Red Wine	Colgate Platinum	74.78±39.82	72.15±13.36	2.628	0.151	0.887
	Opalescence 20%	88.44±31.84	68.94±30.03	19.500	1.406	0.233
	OTC	65.96±12.50	44.90±15.10	21.060	2.140	0.099
Distilled Water	Colgate Platinum	74.08±12.09	76.06±12.12	-2.020	-1.720	0.161
	Opalescence 20%	86.80±15.67	86.92±14.90	-0.120	-0.123	0.908
	OTC	75.06±23.16	75.36±26.44	-0.300	-0.179	0.867

*denotes a significant difference

In table 3 it can be observed that there is a significant difference between the VHN score recorded after staining & after bleaching in tea with Opalescence 20% (P<0.01) & OTC bleaching agents (P<0.05). But no

significant difference is observed in any of the combinations of staining solutions with bleaching agents (P>0.05).

Table 3. Comparison of VHN scores Of Esthet-X after staining and after bleaching

Staining solution	Bleaching Agent	After staining (Mean±SD)	After bleaching (Mean±SD)	Mean difference	t	P-value
Coffee	Colgate Platinum	57.04±10.22	54.16±8.26	2.880	2.138	0.099
	Opalescence 20%	54.46±15.66	45.36±9.38	9.100	2.301	0.083
	OTC	38.78±5.89	35.90±6.18	2.880	2.270	0.086
Tea	Colgate Platinum	45.60±13.89	39.44±14.03	6.160	2.144	0.099
	Opalescence 20%	42.76±8.19	35.00±7.11	7.760	5.079	0.007*
	OTC	45.02±6.47	38.26±5.18	6.760	3.113	0.036*
Red Wine	Colgate Platinum	70.54±20.66	55.32±16.82	15.220	1.171	0.307
	Opalescence 20%	62.70±20.54	45.46±10.62	17.240	2.306	0.111
	OTC	49.64±15.36	43.28±22.87	6.660	1.646	0.175
Distilled Water	Colgate Platinum	57.24±10.42	59.56±14.83	-2.320	-1.005	0.372
	Opalescence 20%	48.04±13.92	46.54±12.86	1.500	1.734	0.158
	OTC	51.26±16.17	53.80±16.82	-2.540	-1.745	0.156

*denotes a significant difference

DISCUSSION

In this study the specimens were immersed in beverages and drinks for a limited period and then kept in distilled water for the remaining period.

Chemical softening of the restoratives may result in decreased physico-mechanical properties. The latter includes diametric tensile strength (Lee et al, 1999) fracture toughness (Ferracane and Marker, 1982), hardness and wear (Wu and McKinney, 1982)⁸.

In addition to the oxidizing agent used in the at home bleaching procedure an additive called carbapol (carboxy polymethelene) may be added to thicken the gel. This additive keeps the gel within the tray better and slows the chemical reaction as a result the bleaching agent is in contact with the surface of composite restorations for a longer time which may result in undesirable effects on the mechanical properties of the composite resin⁵.

In the present study it was observed that there is a very highly significant difference in the VHN values recorded at baseline and after staining in case of Filtek Supreme composite when stained with coffee and tea solutions ($P < 0.001$). But no significant difference was observed in red wine and distilled water ($P > 0.05$).

Hydrogen peroxide is known to have capacities for oxidation and reduction, generating free radicals. In addition to its reactivity, hydrogen peroxide demonstrates an extensive ability for diffusion. Possibly peroxides induce oxidative cleavage of polymer chains. The unreacted bonds are expected to be most vulnerable parts of the polymers. This may lead to a softening and reduction of surface microhardness¹⁰.

Within the limits of this in vitro study it can be stated that prolonged exposure to beverages like coffee, tea and OTC bleaching agents may affect physical properties like surface hardness of Filtek Supreme composite resin. Dentist prescribed bleaching agents may not deleteriously affect Filtek Supreme composite resin restorations present in the mouth. Beverages like tea and dentist prescribed bleaching agents like Opalescence 20% may affect physical properties like surface hardness of Esthet-X composite resin. However, it is difficult to extrapolate the findings of an in vitro study to clinical situations as it is impossible to factor in all the variables that a restoration may be subjected to in the mouth.

CONCLUSION

- In this study, the three staining solutions coffee, tea and red wine were found not to affect the surface of the composite resin Filtek Supreme and

Esthet-X in more than one way. This may be attributed to the difference in the type of the filler used and percentage of filler in the two composites.

- In case of Filtek Supreme, the coffee and tea group were significantly affected by the respective staining solutions. The surface hardness had significantly decreased when compared to the baseline values.
- The tea group in Filtek Supreme was further affected when treated with the OTC bleaching agent. The hardness values had dwindled after the bleaching period.
- In case of Esthet-X, the tea group was significantly affected by the staining solution. The surface hardness values had fallen after the staining procedure.
- The same tea group was further affected when subjected to Opalescence 20% dentist prescribed at-home bleaching agent. The surface hardness values had come down after they were subjected to the bleaching agent.

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Effect of Meditation on Parameters Related to Stress

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ABSTRACT.

Every one experiences stress because of our modern life style. Meditation is the best effortless relaxation technique which is easy to learn and practice in daily life. Regular practice of meditation is highly beneficial and effective in reduction of stress. Most of the studies on effect of meditation have been coupled invariably with practice of set of asanas and kriyas. This study differs from others as we have tried to find effects of meditation alone in Sukhasana posture only, on parameters related to stress in healthy young medical students. Resting heart rate, blood pressure, respiratory rate and anxiety scores were recorded before meditation training and practice and after a period of meditation training and practice and the results were compared. The resting heart rate in post-meditation period was significantly lower than premeditation readings ($p < 0.001$). The decrease in Diastolic Blood Pressure in the post-meditation period was statistically significant ($p < 0.05$). The decrease in respiratory rate after meditation practice was statistically significant ($p < 0.001$). The values of Anxiety scores showed statistically significant decrease after 12 weeks of meditation practice ($p < 0.02$). After 12 weeks of meditation practice there was significant reduction in stress related parameters. Hence meditation practice modulates stress response and modifies one's attitude towards stress. Regular practice of meditation is highly beneficial in reduction of stress and to keep good health.

Keywords: Meditation, Stress, STAI, Anxiety, Sukhasana.

INTRODUCTION

Everyone experiences stress because of our modern life style which is highly competitive, challenging and with full of tensions. Stress is a non-specific response of the body caused by various stressors. Various studies conducted worldwide indicate 75% of general population experiences stress and workplace stress reported to be 32% which is more common in executives especially in women¹. Nowadays even younger age group belonging to professional courses encounter high degree of stress because of competitive curriculum and intense academic competitions more so during challenging situation like examinations².

Now a days stress reduction programmes are becoming essential. The benefits of such programme have convinced even big corporations including NASA. Stress is a hypermetabolic physiological state associated with increased heart rate, blood pressure, respiratory rate, oxygen consumption and blood flow³. Meditation which is a wakeful hypometabolic state associated with greater alertness and causes significant reduction in heart rate, respiratory rate, oxygen consumption, anxiety and plasma cortisol⁴. Meditation by relaxation response helps to counteract the biochemical changes that cause stress. Meditation modulates stress responses and modifies once attitude

towards stress. Meditation is the best effortless relaxation technique which is easy to learn and practice in daily life. Regular practice of meditation is highly beneficial and effective in reduction of stress⁵.

Most of the studies on effect of meditation have been coupled invariably with practice of set of asanas and kriyas. Aged and especially physically weak people may not be able to perform these asanas. There is paucity of studies of effects of meditation alone without incorporating asanas & kriyas. Even some people have difficulty in meditating by adopting Padmasana, but Sukhasana can be easily adopted by any person. Hence this study was undertaken to find out the effect of meditation in Sukhasana posture only on some parameters related to stress in healthy young medical students. Though practice of various asanas were not included in this study, only Sukhasana which is the posture required for performing meditation was included. Meditation along with OM chanting was taught and practiced.

AIMS AND OBJECTIVES

The study was undertaken to study effect of meditation in Sukhasana posture on parameters related to stress in young healthy medical students. The following parameters were studied.

Resting heart rate.
 Resting blood pressure (SBP and DBP).
 Resting Respiratory rate.
 Evaluation of anxiety by STAI questionnaire.

Objectives were to record the above parameters before meditation training and practice in meditation group and after a period of meditation training and practice for 13 weeks in same meditation group and compare the two.

MATERIALS

This study was conducted in the Department of Physiology, KIMS Hubli. After calculation of sample size, twenty five students who came voluntarily to participate in the study were included. This group was called Meditation group denoted by 'M'. This group underwent meditation training for one week followed by meditation practice for 12 weeks.

A detailed physical and clinical examination of each participant was carried out and no abnormality was found. All subjects were right handed, non smokers, non alcoholics and took no drug. They had almost similar dietary intake, activity and life style. They also agreed not to change their lifestyle, diet and activity during the study period. These subjects never underwent meditation training, relaxation exercises and sports related training, in the past and also during the study period. All subjects had normal vision and hearing and were found to be sound physically, mentally, emotionally and psychologically.

METHOD

The following parameters recorded in two phases. First or initial reading was taken well before the participants of meditation group joined meditation course, henceforth denoted by 'M-1' indicating premeditation readings. Final readings were recorded after the participants of meditation group completed the meditation training and practice, henceforth denoted by 'M-2', measurements stand for post meditation readings.

RESTING HEART RATE : This was recorded by using Cardiart 108T mk IV ECG machine, manufactured by BPL India Ltd.

RESTING BLOOD PRESSURE : This was recorded by using Mercury Sphygmomanometer.

RESPIRATORY RATE : This was recorded by using electronic spirometer called Spirolyser model 2spl-100 manufactured by F I M company.

EVALUATION OF ANXIETY : Spielberger's State Trait Anxiety Inventory (STAI) consisting of two parts (X-1 and X-2) was used to assess anxiety levels/scores.

MEDITATION COURSE: The Meditation course was conducted for 13 weeks. Meditation training was conducted for one week by a qualified Yoga trainer. This was followed by meditation practice under supervision for 12 weeks. The students were asked to adopt Sukhasana posture and chant OM for a period of 30 minutes in two spells of 15 minutes each with a rest period of 5 minutes in between during which they were asked to relax.

RESULTS

All the above parameters were recorded in two phases. First reading was taken well before the participants of meditation group joined the meditation course. Henceforth denoted by 'M-1' indicating premeditation readings. Final readings were recorded after the participants of meditation group completed the meditation training and practice. Henceforth denoted by 'M-2', measurements stand for post meditation readings. Statistical analysis of data was done by using paired t-tests and values of t and p were calculated. Value of 0.05 or less was taken as statistically significant.

RESTING HEART RATE : Initial Resting Heart rate (beats/ minute) in the premeditation group (M-1) was 76.32 ± 2.228.

The resting heart rate in postmeditation group (M-2), that is at the end of 12 weeks of meditation

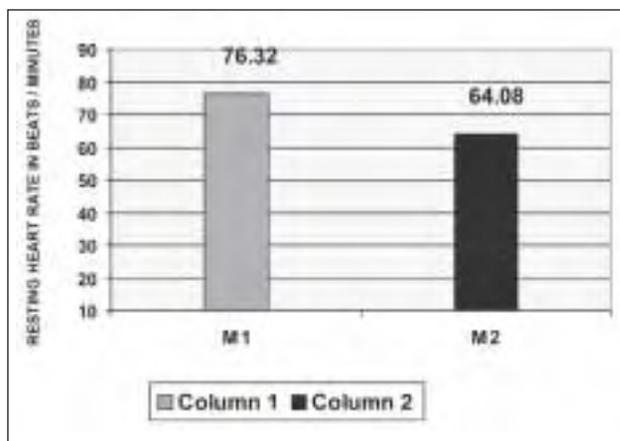
Table 1. Resting Heart Rate, Blood Pressure, Respiratory Rate and Anxiety Scores During Premeditation and Postmeditation Period.

PARAMETERS	M-1	M-2	SIGNIFICANCE LEVEL
Resting Heart Rate (Beats/minute)	76.32 ± 2.228	64.08 ± 2.157	*P<0.001
Resting Systolic Blood Pressure (mm of Hg)	115.2 ± 1.681	112.1 ± 1.531	P<0.20
Resting Diastolic Blood Pressure (mm of Hg)	77.04 ± 1.096	73.76 ± 1.008	*P<0.05
Resting Respiratory Rate(breaths/minute)	19.24 ± 0.971	9.68 ± 0.736	*P<0.001
STAI ScoresX-I	46.36 ± 1.575	36.56 ± 1.063	*P<0.001
STAI ScoresX-II	47.08 ± 1.684	40.92 ± 1.474	*P<0.02

* Indicates Statistically Significant

practice was 64.08 ± 2.157 , which was significantly lower than 'M-1' ($p < 0.001$) [Table-1 and Graph-1].

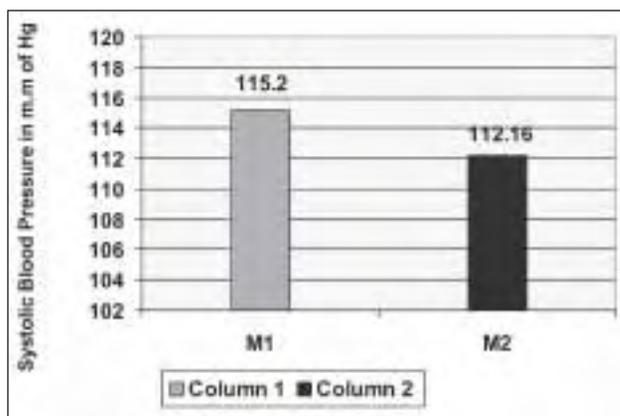
Graph 1. Resting Heart Rate (Mean \pm Sem)



RESTING SYSTOLIC BLOOD PRESSURE : Initial Resting Systolic Blood Pressure (in mm of Hg) in the premeditation group (M-1) was 115.2 ± 1.681 .

The Resting Systolic Blood Pressure in postmeditation group (M-2), that is at the end of 12 weeks of meditation practice was 112.1 ± 1.531 . Statistically significant difference between the two values was not found ($p < 0.20$) [Table-1 and Graph-2].

Graph 2. Resting Systolic Blood Pressure (Mean \pm Sem)

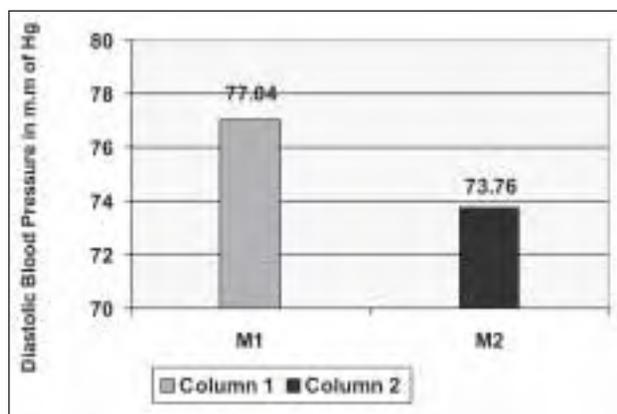


RESTING DIASTOLIC BLOOD PRESSURE : Initial Resting Diastolic Blood Pressure (in mm of Hg) in the premeditation group (M-1) was 77.04 ± 1.096 .

The Resting Diastolic Blood Pressure in postmeditation group (M-2), that is at the end of 12 weeks of meditation practice was 73.76 ± 1.008 . The decrease in Diastolic Blood Pressure in the

post-meditation period of meditation group was statistically significant ($p < 0.05$) [Table-1 and Graph-3].

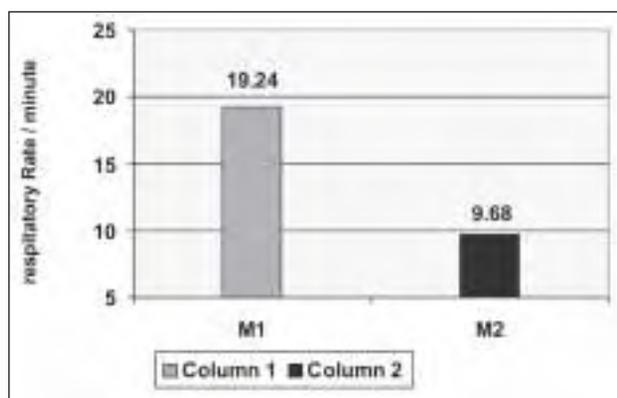
Graph 3. Resting Diastolic Blood Pressure (Mean \pm Sem)



RESTING RESPIRATORY RATE : Initial values of respiratory rate (breaths/minute) in the premeditation group (M-1) was 19.24 ± 0.971 .

The Resting Respiratory Rate in postmeditation group (M-2), that is at the end of 12 weeks of meditation practice was 9.68 ± 0.736 . The decrease in respiratory rate after meditation practice was statistically significant ($p < 0.001$) [Table-1 and Graph-4].

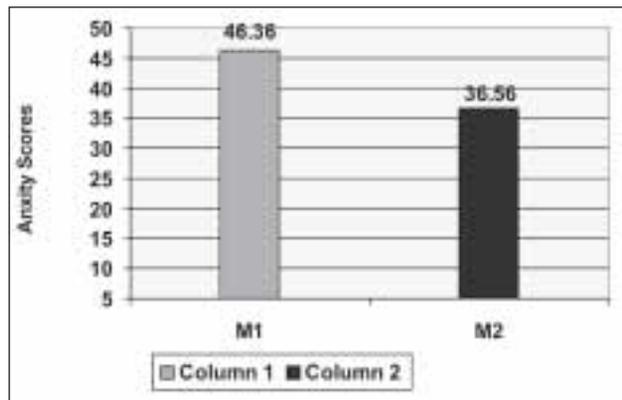
Graph 4. Resting Respiratory Rate (Mean \pm Sem)



ANXIETY SCORES

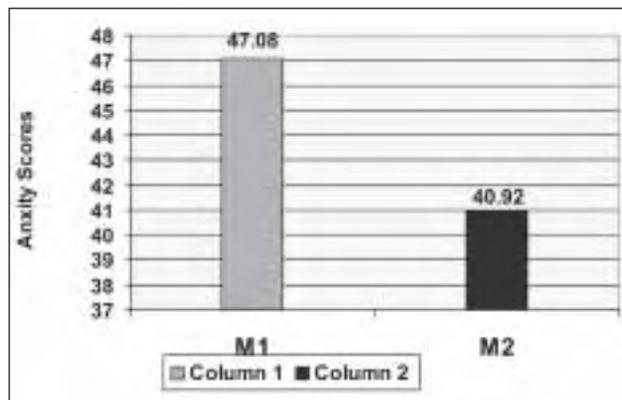
STAI (X-I) Scores : Initial values of Anxiety scores in the premeditation group (M-1) was 46.36 ± 1.575 . The Anxiety scores in postmeditation group (M-2), that is at the end of 12 weeks of meditation practice was 36.56 ± 1.063 . The values of Anxiety scores showed significant decrease after 12 weeks of meditation practice which was statistically highly significant ($p < 0.001$) [Table-1 and Graph-5].

Graph 5. Anxiety Scores (Stai - X 1) Means ± Sem)



STAI (X-II) Scores : Initial values of Anxiety scores in the premeditation group (M-1) was 47.08 ± 1.684 . The Anxiety scores in postmeditation group (M-2), that is at the end of 12 weeks of meditation practice was 40.92 ± 1.474 . The values of Anxiety scores showed significant decrease after 12 weeks of meditation practice which was statistically significant ($p < 0.02$) [Table-1 and Graph-6].

Graph 6. Anxiety Scores (Stai - X 2) Means ± Sem)



DISCUSSION

The resting heart rate showed statistically significant reduction in meditation group after meditation practice ($p < 0.001$). Meditation being a hypometabolic state causes significant decrease in heart rate. Majority of scientific studies shows meditation to be a wakeful state accompanied by decreased metabolism. The generalized decrease in metabolism manifests with decreased heart rate, blood pressure, respiratory rate. These findings have been verified by impressive number of studies. Farrel DJ⁶, Dillbeck M C⁷, Gallois P⁸, Farrow JT⁹, Stehle R¹⁰, Khanam AA et al¹¹, reported significant decrease in heart rate after regular practice of meditation. Wallace¹², Delmonte¹³. Zeier¹⁴, Sudsuang et al¹⁵ reported reduced heart rate associated with meditative

practices. Our results are also similar and support the above findings.

Resting systolic blood pressure after meditation practice was numerically slightly lower than premeditation readings, but there were no statistically significant differences between the values.

The resting diastolic blood pressure decreased after meditation practice which was statistically significant ($p < 0.05$). Meditation produces reduction in systolic and diastolic blood pressure, comparable to those commonly found with antihypertensive medication but without any side effects¹⁶. Cooper and Aygen¹⁷ found significant reduction of high blood pressure in hypertensive patients after practice of meditation. Randomized control trials have found that meditation is more effective in reducing blood pressure than any other relaxation technique¹⁸. In our study there was reduction of only diastolic blood pressure and not systolic blood pressure and our subjects were normotensive from the beginning. Cardiovascular reactivity which is measured as changes in blood pressure and heart rate in response to stressful tasks may predict hypertension.

The decrease in respiratory rate in meditation group after meditation practice was statistically significant ($P < 0.001$). Corey, Paul¹⁹ found increased airway conductance and increased ease of breathing during and after meditation practice. Wallace RK²⁰ reports significant decrease in respiratory rate with a mean decrease of 3 breaths/min during meditation and in one subject respiratory rate decreased from 12/min to 4/min. John T Farrow²¹ in his study reported statistically significant reduction in respiratory rate, wherein he observed 60% reduction in respiratory rate. During meditation practice respiratory rate decreases due to natural reduction in metabolic activity at cellular level and not from a forced reduction of breathing. The reduction in respiratory rate was due to decreased metabolic rate.

The anxiety scores were measured by using STAI, developed by Spielberger C D²² is a definitive instrument for measuring anxiety status in adults. The values of anxiety scores (X-I and X-II) showed statistically significant decrease after meditation practice in meditation group ($p < 0.001$ and $p < 0.02$). A Malathi and A Damodaran²³ observed statistically significant reduction in basal anxiety levels and also significant reduction in the raised anxiety scores prior to the examination compared to the control group. A three months study of managers and employees who regularly practiced meditation in a fortune 100 manufacturing company showed, meditation practitioner displayed more relaxed physiological functioning, greater reduction in anxiety and reduced

tension during jobs. This is due to reduction in limbic arousal. Limbic system contains hypothalamus which controls autonomic nervous system which is responsible for reduction of stress.

SUMMARY AND CONCLUSION

After 12 weeks of meditation practice there was significant reduction in heart rate, diastolic blood pressure, respiratory rate and anxiety status. Stress is a hypermetabolic physiological state associated with increased heart rate, blood pressure, respiratory rate, oxygen consumption and blood flow. Meditation which is a wakeful hypometabolic state associated with greater alertness and causes significant reduction in heart rate, respiratory rate, oxygen consumption, anxiety and plasma cortisol. Most of our observations are attributable either entirely or largely to induction of a hypometabolic state / relaxation response by meditation. Most of the studies on effect of meditation have been coupled invariably with practice of a set of asanas and kriyas. Old and physically weak people may not be able to perform these asanas. There is paucity of study of effects of meditation alone. Hence this study was undertaken to find out effect of meditation in only sukhasana posture, on some parameters related to stress in healthy young medical students.

Though Practice of various asanas were not included, only sukhasana which is the posture required for performing meditation was included, OM meditation along with OM chanting was taught and practiced. Hence only meditation without asanas and kriyas is also effective in reduction of stress. This can be a boon to the hypertensive, diabetic patients who have already crossed middle age and may not be able to carry out various asanas. Meditation brings better harmony between mind and body, which is essential to face stressful situations. Meditation modulates stress response and modifies one's attitude towards stress. Regular practice of meditation is highly beneficial in reduction of stress and to keep good health.

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Fibroid Uterus - A Clinical Profile

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ABSTRACT

Background: Fibroid is the commonest tumor of the reproductive tract and frequently encountered problem in gynecological practice.

Aim and Objectives: To observe the frequency of uterine leiomyoma in relation to age, parity and clinical manifestations.

Material & Methods: Over a period of two years, 1827 hysterectomy specimen sent for histopathology was studied. Uteri with fibroids were included for the study. Clinical data including age, parity, menstrual pattern, presenting symptoms, surgical treatment history of these patients with fibroid was collected and analyzed.

Results: Hysterectomy specimens constituted 65.48% of the total gynecological specimen during the period of two years. Leiomyoma was diagnosed in 314 patients out of 1827 hysterectomies (17.18 %.) Greater frequency (83.45%) was found in late reproductive and perimenopausal years ie 4th and 5th decade with a mean age of 40.9 years. Most of the patients were parous (98.09%) with more than one child. Menorrhagia (46.17%) was the commonest symptom followed by dysmenorrhoea (22.09%). In 72.03% of cases uterus was between 6-12 weeks size.

Conclusion: Leiomyoma is the most common benign tumor of uterus occurring during reproductive age group. Incidence of leiomyoma is increasing in parous women. Patients with abnormal uterine bleeding have to be investigated to find out the exact etiology so that anemia due to prolonged blood loss is prevented and early therapeutic intervention prevents huge growth of the mass, thus preventing secondary complications.

Key words: Leiomyoma; Hysterectomy; age; Parity; Menorrhagia

INTRODUCTION

Uterine leiomyoma (also referred to as myoma, fibromyoma, or fibroid), is the most common benign neoplasm of the female reproductive tract. It represents the clonal expansion of a cell within the myometrium of the uterus. These benign tumors occur in up to 30% of symptomatic reproductive aged women, with the true prevalence estimated to be as high as 70%.The incidence peaks in the fourth decade and declines after menopause. Uterine leiomyoma is one of the leading

indications for hysterectomy. The clinical symptoms and severity usually depend upon the size, position and number of fibroids present. They are asymptomatic in more than 50% of the cases. Dysmenorrhea, abdominal pain, Abdominal mass, pressure symptoms, infertility and repeated miscarriages may be The presenting symptoms.^{1, 2, 3}

Their growth is considered to be dependent upon estrogens excess, as leiomyomas Contain more estrogen receptors than normal myometrium⁴ and they usually Regress after menopause. Other benign tumors of the organ are so rare that they Need only minimal discussion.

Though uterine leiomyomas are common, it is difficult to obtain much information regarding clinical and pathological aspects of it in Indian literature. This

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prompted the present study. The exact incidence is difficult to assess as most of the patients do not come to the hospital unless and until there is presence of progressive symptoms of some duration.

Most of the leiomyomas are believed to be asymptomatic when small and progress slowly. Unfortunately their symptomatology continues to be variable⁵.

Much attention has been focused on the association of leiomyomas with a state of hyperestrinism and as the factor responsible for their growth. Here we present an analysis of leiomyomas in relation to age, parity and clinical manifestations from a large series of hysterectomies.

MATERIAL AND METHODS

This is a descriptive study on patients with leiomyomas, diagnosed in hysterectomy specimen. Over a period of two years, 1827 hysterectomy specimen sent for histopathology were studied in detail both macroscopically and microscopically for the presence of leiomyomas. Uteri harboring leiomyomas were segregated and particulars of those patients regarding age, parity, clinical symptoms were collected from the case records and analyzed.

RESULTS

Gynecological surgical specimen constituted 26.41% (2790) of the total surgical specimen (10,562) received for microscopic diagnosis to the department of pathology during the study period. Of the 2790 gynecological specimen, hysterectomy specimen was 1827 (65.48%). Leiomyoma was diagnosed in 314 specimen (17.15 %.) which included three myomectomies.

Age (Figure 1): Age of these patients ranged from 21 to 70 years with most of the patients in 4th (49.37%) and 5th decade (34.08%). Only two patients were in 7th decade. The mean age was 40.9 yrs.

Age range of 314 patients with leiomyoma

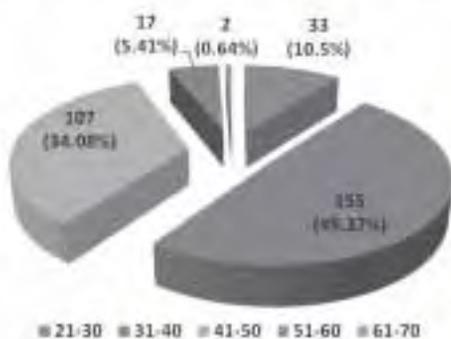


Fig. 1:

Parity (Figure 2): Of the 314 patients with leiomyomas, 308 patients (98.09%) were parous with more than one child and only 6 were nulliparous (1.91%). Seventeen patients had a single child (uniparous).

Parity of patients

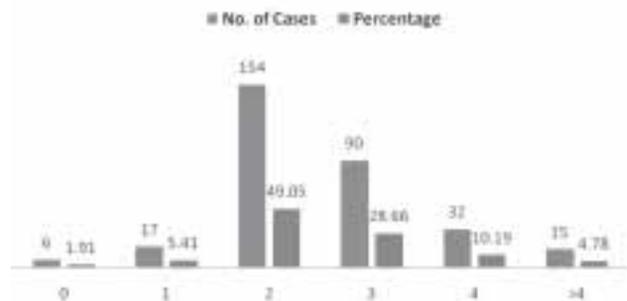


Fig. 2:

Symptomatology (Table 1): Menorrhagia (46.17%) was the commonest symptom followed by dysmenorrhoea (22.29%), pain abdomen (12.74%) and mass per abdomen (14.01%).

Table 1. clinical Symptoms

Symptoms	No. of Cases	%
Menorrhagia	145	46.17
Dysmenorrhoea	70	22.09
Pain abdomen	40	12.74
Mass per abdomen	44	14.01
Prolapse	28	8.91
White discharge per vagina	24	7.64
Mass per vagina	5	1.59
Backache	7	2.22
Bladder disturbances	4	1.27
Metrorrhagia	20	6.36
Polymenorrhagia	10	3.18
Sterility	6	1.91
Fever	5	1.59
Amenorrhoea	1	0.05
Total	314	100

Clinical assessment of uterine size: In 72.03% of cases, uterus was between 6-12 weeks size, as assessed clinically followed by uterine size of 12-20 weeks (8.04%) and with more than 20 wks in 8.04%. Atrophic uterus was found in only 2 (0.64 %) cases.

GROSS PATHOLOGY

Majority of leiomyomas were located in the uterus (96.6%) and the rest were in cervix (3.4%). In this study, of the 311 uteri, 274 (88.10%) uteri were grossly bulky,

35(11.2%) were normal in size and only 2(0.64%) were atrophic.

DISCUSSION

The present study estimated incidence rates for uterine leiomyomata from Hysterectomy

Specimen. Leiomyomas are benign neoplasms commonly encountered in gynecological practice⁶.

In our study; all the benign tumors were leiomyomas with an incidence of 17.15%. Incidence of Leiomyomas varies from 10 % to 77% in different studies done over many decades^{1,7}.

In the present study, majority of the leiomyomas were limited to reproductive age group with higher incidence (49.37%) observed between 31-40 years, similar to previous studies^{2,3}. The role of parity in the etiology of leiomyomas is still not clear. Leiomyomas are believed to be common in nulliparous or relatively infertile women⁶. In contrast in the present study, most patients were multiparous (92.98%), and only 1.9% were nulliparous and uniparous constituted 5.41% of cases. Chhabra & Jaiswal⁷ (82%), Achari & Khanam⁸ (87%) and Rosario Pinto⁹ (76.8%), also noted highest incidence in multiparous women and lowest incidence in nulliparous women in their studies.

The symptomatology continues to be variable. Many patients presented with more than one symptom. It is believed that symptomatology and severity usually depend on the size, number and location of leiomyomas^{8,9}. However majority *remain* symptomless and especially progress slowly. In the present study common presenting symptoms were menorrhagia (46.17%) followed by dysmenorrhoea (22.29%). Menorrhagia was the commonest clinical symptom as noted by Rosario pinto⁹ (37.9%). Mass per Abdomen was present in 14.01% patients, comparable to Rosario pinto⁹ (17.7%). Earlier studies report a higher incidence of patients presenting with mass per abdomen. Newer diagnostic techniques like ultrasonography are helpful to identify the lesion at an early stage, thus helping patients to take treatment before the mass grows to an extent that it becomes palpable per abdomen.

Menorrhagia does not occur in every case, but when the growths are deep intramural or submucous, it is a constant symptom. Increased blood loss often causes severe anemia. Excessive bleeding may be from increased surface of the endometrium or from thickened polypoidal endometrium. Multiple intramural growths by hindering effective uterine contractions result in prolonged & profuse blood loss¹⁰.

In the present study, abnormal uterine bleeding in the form of menorrhagia, metrorrhagia and polymenorrhagia was found in 55.73% of cases. Dysmenorrhoea due to irregular uterine contractions was found in 22.29% of cases. White discharge per vagina (WDPV) (7.64%) was caused by excessive mucus secretion from the hyperplastic endometrium.^{3,10} Bladder disturbances (1.27%) were due to cervical fibroids or those arising from lower part of the body getting impacted into the pelvic cavity, elongating & distorting the urethra & displacing the bladder upwards & stretching the urethra¹⁰. Majority of leiomyomas were uterine (96.6%) and the incidence of cervical leiomyomas was just 3.4%, similar to other studies^{8,9,11}.

Endometrial hyperplasia, adenomyosis & follicular cysts were some of the commonly associated pathological lesions^{8,9}.

CONCLUSION

Leiomyoma is the most common benign tumor of uterus occurring during reproductive age group. Incidence of leiomyomas is increasing in parous women. Patients with abnormal uterine bleeding have to be investigated to find out the exact etiology so that anemia due to prolonged blood loss is prevented and early therapeutic intervention prevents huge growth of the mass, thus preventing secondary complications.

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Prevalence of Anemia and Impact of Weekly Iron-folic Acid Supplementation on School Children in Urban Slums of Haryana, India

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INTRODUCTION

Nutritional anemia is a condition in which the haemoglobin content of the blood is lower than normal as a result of deficiency of one or more essential nutrients, regardless of the cause of such deficiency. The usual causes of nutritional anemia include inadequate supply of iron, folic acid or vitamin B12¹. Anemia in children, especially iron deficiency, is the commonest health problem in many developing countries with an estimated prevalence of 43%². There is convincing evidence that iron deficiency causes impaired growth, developmental delay, behavioural abnormalities and impairs cognitive function and school performance³. Other health consequences include reduced immunity, increased morbidity, increased susceptibility to heavy metal (including lead) poisoning⁴. It has also been associated with functional abnormalities of lymphocytes and neutrophils⁵⁻⁶.

Iron deficiency anemia (IDA) occurs mainly because of:

inadequate dietary intake, particularly of iron rich foods and increased body loss due to worm infestation (hookworm, roundworm). Average Indian diet is generally inadequate in terms of iron, proteins, calcium and overall calories. Moreover, the non-haem content of cereal-based diets has much less bio-availability (5-10%) as compared to haem iron (25-30%) present in the non-vegetarian diet (meat, fish etc)⁷.

It is true that National Nutrition Anemia Control Program (NACP) was launched in the country in 1970 but the benefits of this programme have not been

reached to the target population like children, adolescent girls, pregnant women etc. This is due to the lack of operational feasibility to estimate the hemoglobin levels, orientation of field workers and acceptance of the programme by the beneficiaries⁸.

AIMS AND OBJECTIVES

To find out the prevalence and effect of weekly supplementation of iron-folic acid on anemia

MATERIAL AND METHODS

The present intervention study was carried out from March 2009 to September 2009. All children (n=490) in the age group of 6-11 years from government primary schools of urban slums (field practice area of PGIMS, Rohtak) were covered. The blood samples for haemoglobin estimation were obtained by finger prick method using sterile needles. 20 microliters of blood sample were collected in 5 ml Drabkin solution. The baseline haemoglobin estimation was done by Cyanmethaemoglobin method. Haemoglobin cut-off level for labelling anaemia as per WHO guidelines was taken as 11.5g%⁹.

After obtaining baseline data of haemoglobin levels, the intervention was carried out. A tablet of Albendazole (400mg) was given one week prior to supplementation for deworming and supervised weekly IFA (20mg of elemental iron and 0.1mg folic acid) therapy were administered to all children for six months. The investigator himself gave these IFA tablets by visiting the school once a week. The concerned class teacher was assigned the duty to ensure consumption of IFA tablets by children who were absent on those days. After six months, the repeat haemoglobin estimation was done to assess the impact of intervention in school children.

After collection, the whole data was compiled, analysed and appropriate statistical tests were applied using SPSS software.

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RESULT

Table I. Degree of Anemia Before and After Intervention in 6-11years Children (N-490)

Degree of anemia	Non-anemic		Mild		Moderate		Severe		Total	
	N	%	N	%	N	%	N	%	N	%
Before intervention	114	23.2	254	51.8	116	23.7	06	1.3	490	100
After intervention	282	57.6	174	35.5	34	6.9	00	0.0	490	100

$\chi^2 = 183.8$ $df = 6$ $p < .000$

Overall prevalence of anemia among children was found to be 76.3% with mild, moderate and severe anemia being 51.8%, 23.7% and 1.3% respectively.

After intervention the prevalence of anemia decreased to 42.4% (33.9%). Also the degree of anemia

decreased significantly. The non anemic became 57.6% from 23.2% while mild and moderate anemic decreased from 51.8% to 35.5% and 23.7% to 6.9% respectively. No child was found in severe grade after intervention.

Table II. Mean Haemoglobin Before and After Intervention in 6-11 Years Children (N-490)

Degree of anemia	Before intervention			After intervention		
	N	%	Mean ± SD	N	%	Mean ± SD
Non anemic	114	23.2	12.61 ± 0.64	282	57.6	12.21 ± 0.76
Mild	254	51.8	10.68 ± 0.42	174	35.5	10.61 ± 0.40
Moderate	116	23.7	8.91 ± 0.58	34	6.9	09.20 ± 0.42
Severe	06	1.3	6.50 ± .00	00	0.0	0.0 ± 0.0
Total	490	100	10.6 ± 1.44	490	100	11.4 ± 1.15

$Z = 16.85$ $P < 0.000$

There was rise in mean haemoglobin concentration from 10.6 ± 1.44 g/dl to 11.4 ± 1.15 g/dl after intervention. The rise in mean haemoglobin before and after intervention (0.80g/dl) was found to significant.

DISCUSSION

A reduction in the frequency of iron supplementation to once or twice weekly is being widely examined in developing countries on the assumption that the side effects of oral iron will decrease and that the reduction in administered iron will be offset by a lesser inhibition in absorption from iron taken on the previous day.

The prevalence of anaemia in urban slum school children aged 6 to 11 yr was found to be 76.3 percent in the present study. DeMaeyer et al reported the prevalence of anaemia in 6-12 yr old children to be 36 per cent¹⁰, while Verma M et al found 77 % prevalence among 5-15 yr old urban school children of Punjab⁶. The National Family Health Survey –II conducted in 1998-99, documented that about 74% children between the ages 6-35 months were anemic¹¹. The prevalence was as high as 93 per cent in children from Varanasi by Aggarwal et al.¹² Murthy NK et al found the prevalence of anemia to be 81 % among school going girls in Tamilnadu¹³. The variations in the prevalence of anaemia in other studies could be explained on the

basis of heterogeneity of the studied population, dietary habits, different nutritional status and incidence of worm infestation in a defined geographical area.

After weekly iron supplementation, the anemia decreased from 76.3% to 42.4% among school children in the present study. Kotecha PV et al observed that anemia decreased from 74.7% to 53.2% after weekly iron supplementation in children¹⁴. Meenakshi et al conducted a study among adolescent girls and found a significant decrease (6.8%) in prevalence of anaemia after biweekly iron supplementation¹⁵.

The mean haemoglobin increased from 10.6 ± 1.44 g/dl to 11.4 ± 1.15 g/dl after weekly iron supplementation in the present study. Similar findings were observed by Aggarwal KN et al and Shobha S & Sharada D¹⁶⁻¹⁷. Kapur D et al and Hall A et al also found that weekly iron supplementation significantly decreased the anemia in school children. They found that weekly iron supplementation took longer time to raise haemoglobin, but was found to be effective as well as practical¹⁸⁻¹⁹.

Sunil Gomer et al also observed among pregnant women that equal rise of hemoglobin and hematocrit values in the weekly supplemented group as compared to daily supplemented therapy²⁰.

Liu et al reported that the compliance was nine times higher with the weekly iron supplementation than that with daily dose in children²¹.

Tee ES et al conducted a study on Malaysian school girls and concluded that long term weekly iron-folate improved their iron stores and Hb concentration²².

Shah BK et al also observed that weekly supplementation of iron folic acid on adolescent Nepalese girl increased significantly the mean haemocrit levels²³.

CONCLUSION AND RECOMMENDATIONS

In India, the National Programme for Prevention and Control of Anemia focuses on pregnant women and young children less than 5 years. However, the status of anemia in children is not well documented. Anemia in children therefore continues to be accorded a very low priority. School health services should be regularized and promoted for early intervention and prevention of long term sequelae of anemia. Amongst the intervention measures, it is important to take up sustained health education, provision of safe drinking water and improvement in environmental sanitation. It would be also useful to teach them about personal hygiene and conduct health education like healthy eating habits especially consumption of iron rich foods (green leafy vegetables) and vitamin C rich foods and discouraging intake of tea after meals through 'School Health Projects'. Topics on health and nutrition should be made an essential part of the school curriculum. Aanganwari workers, members of Mahila Swasthya Sanghs and Mahila Mandals and Community Volunteers should be involved in these programmes to promote the nutritional status of children.

It is concluded that once-weekly iron supplementation is as effective as daily supplementation for the treatment of iron deficiency anemia. Moreover, weekly iron supplementation is cost effective and has no or fewer side-effects.

However, supervised weekly iron and folic acid supplementation is more effective and helps to lower the prevalence of anemia in children.

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Study of the Third Head of Biceps Brachii Muscle in South Indian Population

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ABSTRACT

Biceps brachii muscle is a muscle of the flexor compartment of arm. It arises by two heads – a long head and a short head. In terms of number and morphology of its heads of origin, it is most one of the most variable muscles in the body. Most common variation being the presence of third head of biceps muscle, as present in our study. In this study 64 arms from 32 South Indian cadavers were studied, accessory head of biceps was found in 4 out of 64 arms studied.

The accessory (third) heads of the biceps muscle can cause compression of neurovascular structures of upper limbs. Usually the third head of biceps is an incidental finding during dissections and is rarely detected in clinical studies unless it is symptomatic. The presence of accessory head of biceps can cause various difficulties to surgeons in the surgical procedures of arm and may lead to iatrogenic injuries. Hence the knowledge of such type of variation is important for academic interests as well as for surgeons and physiotherapists.

Key words: Third head of biceps, Accessory head of biceps, Variant of biceps muscle.

INTRODUCTION

Biceps brachii is a muscle of anterior compartment of arm. By its value itself it is clear that it has 2 heads. It is characteristically, described as a two headed muscle that originates proximally by a long head and a short head. Short head arises as a thick flattened tendon from the coracoid apex, together with coracobrachialis muscle. Long head arises as a long narrow tendon from the supraglenoid tubercle of scapula¹.

The two heads fuse in the upper half of the arm to form the bulk of biceps muscle. The muscle ends as a flattened tendon, which passes ventrally, turns backwards and laterally to get inserted into the rough posterior area of the radial tuberosity. The biceps brachii muscle is innervated by musculocutaneous nerve (C5 and C6 spinal cord segments) and supplied by brachial and anterior circumflex humeral arteries. The mode of insertion of biceps muscle makes it a powerful supinator of forearm².

It has been reported in 10% cases the third head of biceps may arise from the superomedial part of brachialis and is attached to bicipital aponeurosis or medial side of bicipital tendon. Three different type of origin of third head of biceps have been described, they are superior, inferomedial and inferolateral varieties³. The supernumerary heads of biceps brachii have clinical importance as they may confuse a surgeon who performs surgical procedures on the arm and may lead to iatrogenic injuries or they may cause compression of important neurovascular structures of upper limb⁴.

MATERIALS AND METHODS

The present study was undertaken in Department of Anatomy, JJM Medical College, Davangere where 32 (n = 64), formalin dried cadavers were dissected.

The upper extremities of 32 cadavers (n=64) were dissected irrespective of age and sex for undergraduate teaching purpose. The arm was dissected carefully and the biceps muscle was displayed along its whole extent. The other related structures of the arm were also demonstrated. The details of the additional heads of biceps in 4 upper limbs were examined and photographs were taken accordingly.

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RESULTS

Among the 32 cadavers (n=64) studied third head of biceps were found in 4 upper limbs. They were designated with numbers as case 1 to case 4. The photographs were taken and the related structures of the arm were also demonstrated.

Case-1

The third head of biceps took its origin from inferomedial aspect of arm left side distal to insertion of coracobrachialis. Later on it divided into 2 slips medial and lateral slips. Medial slip merged with medial intermuscular septum of arm; whereas lateral slip was joining the tendon of biceps above the elbow. It was supplied by branches of musculocutaneous nerve (Figure 1).

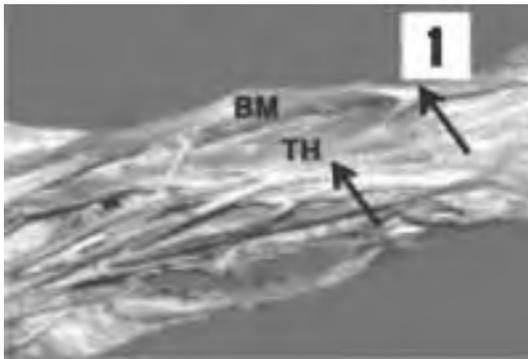


Fig. 1: Photograph showing the third head of biceps (TH) and its two slips with the arrows. Medial slip joining the medial intermuscular septum and the lateral slip joining the biceps tendon. (BM- Biceps muscle. BA-Brachial artery. MN- Median nerve.)

Case-2

The third head of biceps was found in left upper limb. It was found to arise from inferolateral aspect of arm between the insertion of coracobrachialis and brachialis muscle. It joined with the biceps tendon around 5 cms above the bend of elbow. It was supplied by twigs from musculocutaneous nerve (Figure 2).

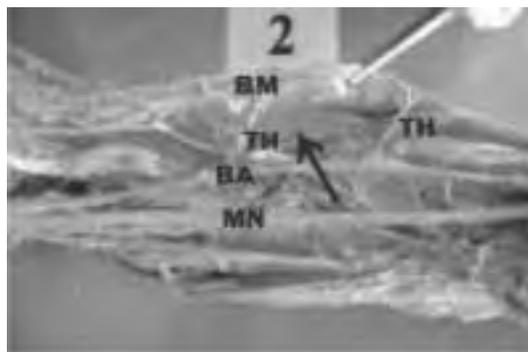


Fig. 2: Photograph showing the third head of biceps (TH) taking origin from the lateral aspect of the humerus (Inferolateral variety of origin). The third head merged with the biceps tendon. (BM- Biceps muscle. BA-Brachial artery. MN-Median nerve.)

Case-3

The accessory head of biceps in this case was found in left upper limb. The third head of biceps took origin as a slender slip of muscle on the inferomedial aspect of arm distal to the insertion of coracobradialis muscle. Distally the muscle slip joined the biceps tendon 2 cm above the bend of the elbow. It was supplied by musculocutaneous nerve. (Figure 3).

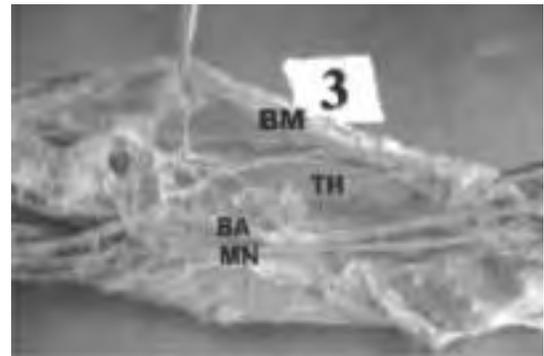


Fig. 3: Photograph showing the third head of biceps (TH) with an arrow. The accessory head of Biceps was very slender in this specimen. (BM-Biceps muscle. BA-Brachial artery, MN- Median nerve)

Case-4

The accessory head was found in an left upper limb. It had a wide bony origin on the inferomedial aspect of arm both above and below the insertion of coracobrachialis muscle. It joined the biceps tendon around 5cms above the bend of the elbow and was supplied by musculocutaneous nerve.

The breadth of the accessory head at its widest part was 12 cms and total length of muscle -16 cms. (Figure 4).

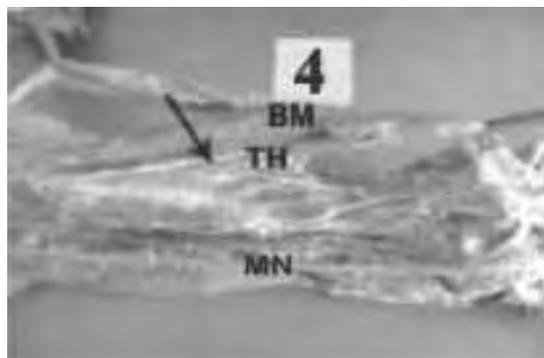


Fig. 4: Photograph showing the third head of biceps (TH) with an arrow. The accessory head of Biceps was very wide in its origin in this specimen. (BM- Biceps muscle. BA-Brachial artery. MN- Median nerve.)

DISCUSSION

The occurrence of third head of biceps has been reported by various authors. The present study

highlights the occurrence of third head of biceps in the south Indian population and an effort has been made to compare this study with previous studies.

Grays anatomy reported the occurrence of third head in 10% of cases¹. Biceps muscle is extremely variable muscle in terms of number and morphology of its heads of origin. Three headed biceps brachii muscle is a more common variant among the supernumerary heads of biceps which can be from three to seven heads of origin the prevalence of third heads is between 7.5-18.3% with no radial and gender differences⁵.

Third head of biceps is seen in 8% of Chinese, 10% in European whites, 18% Japanese⁶, 20.5% in South African blacks, 8.3% in South African whites⁷, 15% in Turkish⁸ and 7.1% in Indian population⁹. If the supernumerary head is relatively large it may provide additional strength to the biceps brachii as reported by Switter and Carmicheal¹⁰. This finding is similar as found in case 4 (Figure 4) of our study where the third head had very wide origin.

Rodriguez³ classified the supernumerary heads based on their origin and location into superior, inferomedial and inferolateral heads of origin. The inferomedial head was observed in 31 out of 350 arms (9%) and therefore more common variant. Superior humeral head of origin was found in 5 cases (1.5%) and inferolateral head was least common variant seen in 1 out of 350 arms (0.3%). Similarly in our study we found inferolateral head of origin in one case i.e., case 2 (fig. 2).

CONCLUSION

In our study 64 upper limbs were studied for the presence of third head of biceps. In 4 arms out of 64 we found the presence of third head of biceps. The prevalence being 6.25% which is nearer to the earlier studies in Indian population by Rai R (7.1%)⁹.

Our study highlights the rarest site of origin of occurrence of third head of biceps from the inferolateral aspect of arm (Figure 2) which accounts to only 0.3% according to the study of Rodriguez. Also our study is unique where in which in one of the specimen (Figure 1), the third head divided into two slips medial and lateral slip before insertion, further the medial slip merges with medial intermuscular septum of arm and lateral slip joins the biceps tendon. This finding again is very rare and was not reported by earlier workers and articles reviewed.

The presence of third head of biceps this important to know because it can compress the median nerve, brachial artery because of its close relationship as seen in specimen 1 of our study (Figure 1). The knowledge of this type of variation is important for surgeons and orthopedicians for the surgeries of arm. Thus the present study was an attempt to know the accessory head of biceps muscle and highlight the clinical importance of it from academic and surgical point of view.

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Bilirubin Induced Neurological Dysfunction Syndrome - Report of an unusual case

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ABSTRACT

Bilirubin Induced Neurological Dysfunction Syndrome (BIND) Syndrome is a condition caused by bilirubin toxicity to the basal ganglia, hippocampus and various brainstem nuclei. In the acute phase, severely jaundiced infants become lethargic, hypotonic and suck poorly. If the hyperbilirubinemia is not treated, the infant becomes hypertonic and may develop a fever and a high-pitched cry.^[1] The hypertonia is manifested by backward arching of the neck (retrocollis) and trunk (opisthotonus). Surviving infants usually develop a severe form of choreoathetoid cerebral palsy, hearing loss, dental dysplasia, paralysis of upward gaze and, less often, intellectual and other handicaps.^[2] Hereby presenting a rare case report of a 9 year old female patient having BIND Syndrome with typical dental manifestations.

Key words: BIND Syndrome, Kernicterus, Hyperbilirubinemia, Dental Dysplasia, Cerebral Palsy

INTRODUCTION

Parents of a nine year old female patient reported to Department of Oral Medicine, Bapuji Dental College with the complaint of multiple decayed teeth in the upper teeth region of the patient and wished to get them restored. The medical history of the patient dated back to third day post-partum of full term normal delivery, when the patient developed jaundice and hyperbilirubinemia which was more than 20 mg/dL. The patient had delayed milestones, she was not able to speak or hear since birth. The patient had abnormal movement and posture of the limbs. Patient does not have bowel and bladder control, child eats if food is placed in the mouth but never shows active intentional movements. Patient frequently has febrile episodes and cough. There is no history of seizures.

The parents of the patient had consanguineous marriage. The blood group of the mother is "O" Rh positive whereas that of the patient is "A" Rh positive. Two year old male sibling is normal.

On general physical examination the patient is poorly built and nourished. There is generalized

wasting and rigid tonicity of the muscles. Superficial abdominal reflexes and deep tendon reflexes could not be elicited due to rigidity. Gross motor milestones like neck holding, sitting and standing without support not achieved. Milestone of sitting and standing with support is that of two years normal child. Fine motor milestones are not achieved. There is exaggerated lumbar lordotic curvature and bowing of the trunk (opisthotonus) and backward arching of the neck (retrocollis). Severe mental retardation was noted.

The patient weighs 9 kgs, height 90 cms and Body Mass Index (BMI) of 11kg/m². Respiratory rate was 32 cycles per minute and blood pressure 90/80 mm of Hg.

On extra oral examination patient is dolico-cephalic and dolico-facial with frontal bossing. Emaciation of the face is seen. Depressed nasal bridge is seen. The patient has paralyse of upward and downward gaze. Rigidity of the neck and facial musculature noted. On intra oral examination patient exhibited involuntary movements of the tongue. On examination of hypoglossal nerve, tongue spasticity was noted. Patient has a complete set of deciduous teeth with all permanent first molars. Teeth show rampant caries and generalized enamel hypoplasia. A provisional diagnosis of kernicterus was made based on medical history and clinical examination.

Hematological examination reveals Hb 10.1 gm%, ESR 26 mm/1st hour and normocytic hypochromic

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Fig. 1: Dolicocephalic, dolicocephalic and frontal bossing

anemia. Unconjugated bilirubin of 0.5 mg/dl and albumin and globulin ratio of 1.2. Auditory examination by “Brainstem Evoked Response Audiometry” (BERA) test revealed profound bilateral peripheral sensorineural hearing loss.

Patient was then referred to pediatrician who cross examined the patient and arrived at the final diagnosis of BIND syndrome.

DISCUSSION

The syndrome of Bilirubin induced neurological dysfunction (BIND) refers to a wide spectrum of



Fig. 2: Retrocollis, opisthotonus and generalized hypertonia of the muscles

disorders caused by severe hyperbilirubinemia that includes kernicterus. The common insult in all cases of BIND is a total serum bilirubin level that exceeds the infant’s neuroprotective defenses and results in neuronal injury, primarily in the basal ganglia, central and peripheral pathways, and hippocampus brain stem nuclei for oculomotor function and cerebellum.^[1] It is a common complication of hyperbilirubinemia associated with Rh erythroblastosis fetalis and, occasionally, ABO hemolytic disease.^[3] Bilirubin toxicity manifests as hypotonia followed by hypertonia and/or opisthotonus or retrocollis⁴.



Fig. 3: Rampant caries

Risk factors for severe hyperbilirubinemia include Rh and ABO incompatibility, glucose-6-phosphate dehydrogenase (G-6-PD) deficiency.^[5] Serum bilirubin levels of ≥ 20 mg/dL pose a high risk for kernicterus, and represent a medical emergency; severe kernicterus is often fatal, and characterized by lethargy, poor feeding, hypertonicity, seizures and apnea; survivors have sequelae in the form of dental dysplasia, cerebral palsy, hearing loss, severe jaundice, lethargy, poor feeding, choreoathetoid cerebral palsy, mental retardation, sensorineural hearing loss, gaze paresis.^[6]



Fig. 4: Generalized enamel hypoplasia

The classic signs of bilirubin encephalopathy in the severely hyperbilirubinemic term infant include increasing hypertonia, especially of extensor muscles, with retrocollis (backward arching of the neck) and opisthotonus (backward arching of the back), or both, in association with varying degrees of drowsiness, poor feeding, hypotonia, and alternating tone. The early presenting signs and symptoms of BIND can be described in terms of mental status, muscle tone, and cry⁷.

The chronic, irreversible bilirubin encephalopathy in its various presentations may include extrapyramidal movement disorders (dystonia chorea and athetosis), gaze abnormalities, auditory disturbances (especially sensorineural hearing loss with central processing disorders and/or auditory neuropathy), and enamel dysplasia of the deciduous teeth⁸.

Approximately 55-65% patient of BIND syndrome present with these features. In early stage of BIND hypertonia and retrocollis, which increase in severity and are usually accompanied by a shrill cry and an unexplained irritability alternating with increasing lethargy⁸.

Visual abnormalities: Ocular movements are affected, most commonly resulting in upward gaze abnormality, although horizontal gaze abnormalities and gaze palsies can also be observed. These deficits result from damage to the corresponding cranial nerve nuclei in the brain stem⁶.

Auditory abnormalities: Hearing abnormalities are the most consistent feature of chronic bilirubin encephalopathy and can develop in patients who show none of the other characteristic features. Auditory disturbances are almost always present and are both central (brainstem) and peripheral (auditory nerve) in origin. The most common abnormality is high-frequency hearing loss, which can range from mild to severe.^[6] These deficits can result from damage both to the cochlear nuclei in the brain stem and to the auditory nerve, which appear to be exquisitely sensitive to the toxic effects of bilirubin, even at relatively low levels⁸.

Some degree of dental enamel hypoplasia and multiple carious teeth can be observed in about three-quarters of the patients with BIND⁸.

Advanced signs are marked by cessation of feeding, seizures, fever, and coma. Death from acute kernicterus is due to respiratory failure and progressive coma or intractable seizures⁹.

Patient's history of post-partum jaundice, parents having consanguineous marriage, mother having "O" blood group and patient having "A" and clinical examination revealing mental retardation, delayed milestones, generalized hypertonia, wasting of muscles, retrocollis, opisthotonus, paralysis of upward and downward gaze, sensorineural hearing impairment, involuntary tongue movements and dental enamel hypoplasia strongly favors diagnosis of BIND Syndrome.

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A Correlative Study of Gingivitis and Alveolar Bone Loss in Multiparity

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Abstract

Aim: To evaluate any possible correlation between gingivitis and alveolar bone loss in multiparity

Material and Method: 50 non-pregnant and 50 pregnant subjects each were subjected to clinical examination for plaque and gingivitis of all the teeth using Loe and Silness index. Roentgenographic examination of maxillary and mandibular central incisors and right and left maxillary and mandibular 1st molars was done at random.

Results: Irrespective of pregnancy or non pregnant state gingivitis and plaque exhibit a strong correlation with time. The level of gingivitis has no effect on the alveolar - bone loss during or after pregnancy.

Conclusion: Gingival changes associated with pregnancy is due to the effects of hormonal changes and even more, so due to multiparity.

INTRODUCTION

Periodontal Changes in pregnant women have been reported in the literature before the discovery of female sex hormones¹.

Changes in the gingival tissues during pregnancy have seen termed as "Pregnancy Gingivitis". During this period the gingiva may appear hyperemic and enlarged and bleed frequently during brushing or on external manipulation².

Gingivitis is aggravated during pregnancy due to alteration of endocrine function, conditioned by local irritative factors, or modified by systemic disturbance.^{3,4} Age and parity were also found to affect the gingival conditions of pregnant women. Additional factors like socio- economic status, nutrition, mental stress and oral hygiene⁵ were also found to play an important role in aggravating the gingival condition during pregnancy. In pregnancy, though all the hormones are affected, but the major changes are in

the female sex steroids - estrogen, progesterone and gonadotropins³. The correlation of the increased inflammatory state of the sex steroids showed that these hormones influence the inflammation of the gingival tissues.

Tooth mobility⁶ changes have also been reported during pregnancy. It has been suggested that increased tooth mobility during pregnancy was not brought about by alteration of the alveolar bone but merely by changes in the periodontal membrane⁷.

The effects of pregnancy on the periodontal membrane and tooth supporting alveolar bone have rarely been investigated. Therefore a study was conducted to determine if there is any correlation between alveolar bone loss and gingivitis in multiparity.

AIM

To evaluate any possible correlation between gingivitis and alveolar bone loss in multiparity.

MATERIAL AND METHOD

A statistically designed sample, comprising of 100 females, both pregnant and non-pregnant, in the age group of 18-45 years was drawn from the Queen Mary's Hospital and Dental Out Patient Department of KGMC, Lucknow.

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The sample was divided into 2 groups which constituted the control and the experimental group of 50 non-pregnant and 50 pregnant subjects each.

The experimental (pregnant) sample was divided into 2 sub groups having 25 subjects in each, depending upon the frequency of pregnancy experience as under:

1. Gp IA - 1st Pregnancy
2. Gp IIA - More than 2 Pregnancy experiences

For each experimental (pregnant) group there was a corresponding control group depending upon the non - pregnant females having lesser frequency of pregnant experience namely:

1. Gp IB - No pregnancy experience
2. Gp IIB - Not more than 2 pregnancy experiences

Only healthy subjects were included in the study. Care was taken to exclude all the cases having acute diseases, chronic debilitating diseases, anterior traumatic bite, severe attrition, malocclusion and excessive decay. The 3rd molar was not considered.

The selected cases were subjected to clinical examination of all the teeth. Roentgenographic examination of maxillary and mandibular central incisors. and right and left maxillary and mandibular 1st molars was done at random. The clinical assessment of gingivitis and plaque was made by gingivitis and plaque index system proposed by Loe and Silness⁸ respectively.

RADIOGRAPHIC INTERPRETATIONS

Alveolar bone loss was measured as percentage of "maximum bone loss", on basis of Herulf's investigation and the criteria adopted by Oliv Schei and Waerhaugh,⁹ the alveolar crest was considered to be of optimum height when it was 1 mm or less from the cemento-enamel junction.

A measuring gadget was made on a translucent plastic rule. A line was made 1mm from the margin corresponding to the normal distance from the alveolar crest to the cemento-enamel junction. Close to the end of the baseline a point was chosen as center and from this center 10 radii with exactly the same distance

between each of them were made. The base, as well, formed the first radius.

During the measurement the ruler was placed over the x-ray film in such a manner that the margin of the ruler covered the cemento-enamel junction. The ruler was moved until the last radius covered the apex. Through the translucent ruler the alveolar crest could be seen either under one of the radius or between two of them. In this way it was possible to assess the height of the bone with an accuracy of upto 5%. As alveolar crest was considered the point where the periodontal membrane space was found to be of approx normal width.

However, in many cases such a definite point could not be found, for which reason no measurement was made where no interproximal fillings were present, the CEJ could be localized with certainty. Although in most of the cases difficulties were encountered. In many cases the CEJ was observed by interproximal fillings and if so, the central margin of the fillings was chosen as the base - line. Separate measurements were made for mesial and distal surfaces of each tooth.

RESULTS

The following results were drawn from the clinical roentgenographic study of gingivitis and alveolar bone loss in multiparity -

1. Irrespective of pregnancy or non pregnant state gingivitis and plaque exhibit a strong correlation with time. The correlation being stronger in the absence of pregnancy.
2. The segment wise comparative significance of these correlations among the four groups are shown in Table 1 to 5.
3. Generally the level of gingivitis has no effect on the alveolar - bone loss during or after pregnancy.
4. Alveolar bone loss is not related to the absence or presence of pregnancy and a significant loss of alveolar bone may occur in the absence of pregnancy.

DISCUSSION

Table 1. Comparative significance of correlation coefficient values of gingivitis and percent bone loss in the maxillary anterior segment of pregnant (Groups IA and IIA) and nonpregnant (Group IB and IIB) groups

Group	No. of Cases	Average age (years)	'R'	Normal variate 'Z'			
				IA	IB	IIA	IIB
IA (Pregnant)	25	21	-0.025	-	2.01*	1.98*	2.69**
IB (Nonpregnant)	21	21	0.39	-	-	1.35N.S	1.41 N.S.
IIA (Pregnant)	27	27	0.24	-	-	-	1.99*
IIB (Nonpregnant)	29	29	0.50	-	-	-	-

* Significant at 5% level of hignificance, ** Significant at 1% level of significane, N. S. - Not significant.

Table 2. Comparative significance of correlation coefficient values of gingivitis and percent bone loss in mandibular anterior segment of pregnant (IA & IIA) and nonpregnant (IB & IIB) groups.

Group	No. of Cases	Average age (years)	'R'	Normal variate 'Z'			
				IA	IB	IIA	IIB
IA (Pregnant)	25	21	0.077	-	0.31N.S	1.56 N.S	1.98*
IB (Nonpregnant)	25	21	0.003	-	-	1.61N.S	2.01 *
IIA (Pregnant)	25	27	0.11	-	-	-	0.89 N.S
IIB (Nonpregnant)	25	29	0.19	-	-	-	-

* Significant at 5% level of significance

N. S. not significant

Table 3. Comparative significance of correlation coefficient values of gingivitis and percent bone loss in maxillary posterior segment of pregnant (group IA and IIA) and nonpregnant (group IB and IIB) groups.

Group	No. of Cases	Average age (years)	'R'	Normal variate 'Z'			
				IA	IB	IIA	IIB
IA (Pregnant)	25	21	-0.086	-	0.09N.S	2.01*	1.97*
IB (Nonpregnant)	25	21	0.083	-	-	2.02*	1.98*
IIA (Pregnant)	25	27	0.29	-	-	-	1.21 N.S.
IIB (Nonpregnant)	25	29	0.17	-	-	-	-

* Significant at 5% level of significance.

N.S. not significant.

Table 4. Comparative significance of correlation coefficient values of gingivitis and percent bone loss in mandibular posterior segment of pregnant (group IA & IIA) and nonpregnant (group IB & IIB) groups.

Group	No. of Cases	Average age (years)	'R'	Normal variate 'Z'			
				IA	IB	IIA	IIB
IA (Pregnant)	25	21	-0.064	-	2.11*	1.98*	1.41N.S.
IB (Nonpregnant)	25	21	0.32	-	-	1.96*	1.99*
IIA (Pregnant)	25	27	0.16	-	-	-	0.10N.S.
IIB (Nonpregnant)	25	29	0.10	-	-	-	-

" Significant at 5% level of significance

" N. S. Not significant.

Table 5. Comparative significance of alveolar bone loss in pregnant and nonpregnant groups.

Group	Mean percent bone loss	IA	IB	IIA	IIB
IA (Pregnant)	15.387	-	0.05N.S.	0.05N.S.	0.05N.S.
IB (Nonpregnant)	10.280	-	-	0.05N.S.	0.05*
IIA (Pregnant)	17.195	-	-	-	0.05N.S.
IIB (Nonpregnant)	22.045	-	-	-	-

* Significant at 5% level of significance

N. S. not significant

Changes in the severity of periodontal disease has been documented during the course of pregnancy (Cohen 1971),² which is reflected in terms of gingivitis. An increased level of estrogen and progesterone in the circulating blood of females during pregnancy was noted. This, along with the dental plaque has been assumed to cause changes in the gingival tissues manifesting as gingivitis^{10,11}. Any pre-existing gingivitis at the beginning of pregnancy appeared always to increase gradually in severity with the advancement of pregnancy and decrease after parturition (Hugoson) 1971¹².

Higher concentration of female sex steroids, mainly

estrogen and progesterone, acting for a longer period of time during pregnancy has been believed to have a hyperemic and permeability increasing effect on the periodontal vascular system as shown for other parts of the body (Gersh and Catchpole).¹³

The present study was undertaken to determine the effect of multiparity on gingival and supporting periodontal tissues, especially the alveolar bone.

In the present investigation a strong correlation between gingival and plaque scores was apparent for both pregnant and non - pregnant groups. The findings also leads to the belief that during pregnancy gingival response is associated to a lesser extent with the soft deposits around the teeth. This is in agreement with Cohen et al.²

Loe & Silness³ suggested that during pregnancy, an additional factor, probably hormonal in nature is introduced. This, together with bacteria may be responsible for the accumulated inflammatory response. The finding of this study is in agreement with those of Hugoson¹² who found that gingivitis become more severe during pregnancy without any accompanying increase in the amount of bacterial

plaque.

IOPA radiographs of both pregnant and non-pregnant females in the present investigation did not reveal a definite pattern of bone destruction in any of the groups. Evaluation of individual segments revealed that correlation between gingival score and percent bone loss was statistically insignificant.

During pregnancy, there is a lowering in the blood Ca level of mother due to increase demands of Ca.¹⁴ the total amount needed by the fetus is, however, small as compared to the total body Ca of the mother. Though periodontal disease especially alveolar atrophy is theoretically possible during pregnancy; it is actually rarely associated with it primarily (Shour 1943)¹⁵.

CONCLUSION

In conclusion it may be said that gingival changes generally associated with pregnancy with special significance of the effects of hormonal changes and even more, so due to multiparity.

Removal of oral debris and improved oral hygiene reduced gingivitis, suggesting that the marginal flora played a primary etiologic role in pregnancy gingivitis as well as in common marginal gingivitis.

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A Rare Case of Duodenal Perforation in a Child - A Case Report

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INTRODUCTION

Primary duodenal ulcer disease occurs in children of all ages, but most often seen in those above ten years. As in adults, it often pursues a chronic course. Primary ulcer seen in children under 6 years is more unusual, and does not tend to recur. Stress ulcers are seen most often in infants and in critically ill children and are asymptomatic until the complicated by hemorrhage or perforation¹.

CASE REPORT

A four-year-old male child referred from Pediatrics OPD, brought by his father with a history of sudden onset of pain abdomen generalised all over abdomen. History of constipation since 3 days was present. History of 5-6 episodes of greenish coloured vomiting along with high fever since 2 days was given by his father. Patient was treated conservatively for 2 days in a private hospital and was then referred to pediatrics OPD. There was no past history of fever, abdominal trauma or analgesic consumption. Birth history revealed a full term normal delivery and attended all milestones normally. No other significant personal history.

On general physical examination child was moderately built but poorly nourished, looked drowsy, apathetic and pale. Pulse rate of 108 beats/min, BP of 90/60 mmHg and respiratory rate of 28 cycles /min were recorded. Abdominal examination revealed distention and generalised rigidity. On Percussion, tympanic note was heard all over the abdomen, liver dullness- obliterated and there was a evidence of free fluid in the abdomen.

Investigations:

- Erect abdominal radiograph showed free gas under diaphragm,

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- Hemogram showed Hb% of 4.5 gms,
- Total count was raised with predominant neutrophilia,
- Blood urea and creatinine was normal and
- Blood grouping and cross matching was done with revealed blood group of A⁺ve.

Diagnosis

Based on history, clinical findings and investigations clinical diagnosis of perforative peritonitis, secondary to ileal perforation due to typhoid fever and appendicular perforation was given.

Laparotomy findings showed duodenal perforation (1st part), significant peritoneal contamination and flakes(++), ulcer closed with Graham's omental patch and a solitary round worm was seen in the peritoneal cavity. Peritoneal cavity was washed and checked for Meckel's diverticulum and any other anomalies.

In Post operative period child was investigated for typhoid and widal was negative. H.Pylori serology not done. Patient did well for the first 2 days but developed pneumonia on third day and was shifted to pediatrics ward. On day 4, superficial surgical site infection and burst abdomen was noted. Tension suturing was done. On 8th post operative day patient coughed out a round worm. the child was dewormed. A course of H.pylori eradication was given. Patient discharged after 18 days of surgery.

Differential Diagnosis:

- Enteric perforation.
- Appendicular perforation.
- Meckel's Diverticular perforation.

DISCUSSION

Gastrointestinal perforation is one of the major complication of peptic ulcer that may result in sudden death. Perforation of the gut leads to leakage of intestinal contents into abdominal cavity causing peritonitis. Commonest site of perforation is duodenum. Predominant age for duodenal ulcer is

25-75 years. Rarely seen before the age of 15 years. Duodenal ulcer is an uncommon entity in children. Incidence of 1.55 cases per year reported in an Indian series. Its diagnosis is overlooked because of vague and variable symptoms and low index of suspicion on part of the treating physicians.

Peptic ulcer in children can be associated with:

1. Z-E syndrome.
2. Sickle cell anemia.
3. H. pylori infection
4. Blood group 'O' etc.

Peptic ulcer are seen secondary to medications like non-steroidal anti-inflammatory drugs (NSAID) and corticosteroids or physiological stress in burns, head injury and mucosal ischemia. H.pylori infection is very common in developing countries. Food contaminated under less than ideal conditions or exposed to contaminated water or soil may increase the risk. Inadequate sanitation practices, low social class and crowded or high density living condition seem to be related to a higher prevalence of H.pylori infection.

Duodenal ulcers associated with H.pylori are seldom seen in children under ten years of age².

CONCLUSION

The operating surgeon should keep in mind such a diagnosis in any child with acute abdomen. Simple closure of the perforation with omental patch is an adequate procedure in emergency. ³Incidence and pathogenesis remain debatable.

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Hyalinizing Clear Cell Carcinoma - A Rare Parotid Tumor

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INTRODUCTION

Hyalinizing clear cell carcinoma of salivary glands is very rare tumour. It mainly affects minor salivary glands and rarely occurs in parotid glands. Because of its rarity, it is not established whether it is a benign or malignant tumour and also its prognosis¹. Present case report of Hyalinizing clear cell carcinoma of parotid gland has been therefore highlighted.

CASE REPORT

History

A 60 years old female presented with swelling over the right side of her face since 8 months and discharge from the swelling since 1 week. History of present illness revealed that the swelling was small to start with and progressed to reach present size. It was painless all this while. The swelling ruptured spontaneously and discharge was bloody from the summit of swelling. No history of trauma, fever, increased salivation, loss of weight or appetite.

Examination

On examination she was elderly lady with stable vitals but pale. On local examination there was swelling over the right parotid region measuring approximately 10x8 cms, ovoid in shape with bosselated surface. Its vertical extent was from zygomatic arch to 4 cms below the inferior border of mandible and horizontally from 4 cms proximal to angle of mouth to mastoid. There was copious, bloody discharge from the summit of swelling. There were no dilated veins, skin over it was stretched and shiny. Ear lobule was lifted up.

On palpation no tenderness or local rise of temperature. Skin over the swelling was pinchable. The swelling was not fixed to underlying structures.

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Intraoral examination including parotid duct opening was found to be normal.

Investigations

-The routine investigations were normal except for anemia (Hb%-8gm%)

-FNAC of swelling reported to be a pleomorphic adenoma of right parotid gland.

Clinical diagnosis

Based on history, examination findings and investigation findings clinical diagnosis of Pleomorphic adenoma of the right parotid gland with anemia was given.

Treatment plan

Patient was prepared for surgery and superficial parotidectomy was planned.

Operative findings

A well capsulated single cystic swelling was found. The swelling was removed and wound was closed using a transposition flap, over a suction drain. Patient withstood the procedure well and post operative period was uneventful.

Patient had come for follow up 2 months later, wound was healed well and patient had no complaints.

Histopathological report

To our surprise, the report was hyalinizing clear cell carcinoma of parotid gland.

DISCUSSION

Hyalinizing clear cell carcinoma of parotid gland, there is only a brief mention of this entity in text books and only a handful of articles have thrown light on it. Hyalinizing clear cell carcinoma (HCCC) is a recently described neoplasm predominantly affecting the oral cavity in adult females. It is relatively well defined group described by Milchgrub et al¹. A total of 11 cases have been reported in literature. Out of these 11 cases 9 cases tumor was arising from minor salivary glands. Thus HCCC arising from parotid gland is even more rare.

It is considered to be low grade indolent neoplasm, because of rare recurrence and metastasis^{2,3}. In one of the studies with relatively short follow-up of less than 10 years none of the patients were found to have died from the disease. However few studies have found to have recurrence rate of 8% and 15% rate of metastasis to regional lymphnodes³.

This low grade neoplasm could be treated by a wide excision, though further case studies and long term follow up would be necessary to document it.

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Clinico Pathological Study of Leprosy in Northern Karnataka

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ABSTRACT

Leprosy continues to be a public health problem in India. Cases were selected regardless of their age, sex, religion, occupation and socio economic status. Pathological examination helps in confirming the clinical diagnosis. Clinically exact typing of leprosy is difficult and even slit-skin smear yields poor results. Majority of the cases were seen in second and third decade. Patients of both sexes were affected and it was more in males than in females. Patients from different religions were affected among these most of them belonged to Hindu religion.

Key words: Leprosy; Histopathology; Diagnosis;

INTRODUCTION

Leprosy continues to be a major public health problem in Asia and Africa. Control of leprosy mainly based on identifying and destroying the causative organism. For effective treatment and control, the diagnosis of leprosy should be done at the earliest and should be accurate. Pathological examination helps in confirming the clinical diagnosis. Clinically exact typing of leprosy is difficult and even slit-skin smear yields poor results. Thus histopathological examination is necessary for both accurate and exact typing.

MATERIALS AND METHODS

The present study was undertaken from March 1994 – January 2005 in the Department of Pathology, Karnataka Institute of Medical Sciences, Hubli. Histopathological study of 135 skin biopsy specimens of leprosy patients were done.

All the biopsy specimens were received along with requisition for histopathological study containing clinical history, signs and symptoms of skin lesions,

results of slit skin smears for AFB with BI in some cases and probable clinical diagnosis.

Cases were selected regardless of their age, sex, religion, occupation and socio economic status. Details of patient history and clinical examination were noted of the patients who clinically presented with hypopigmented / erythematous maculas, plaques, nodules, papules or a combination of these, along with impaired sensation for touch, pain, and temperature and nerve involvement .

Biopsy tissues were immediately fixed in 10% formalin for 12-24 hours. The tissue were processed, embedded in paraffin wax and cut into thin sections of 4-5 microns.

Sections were stained with routine hematoxylin and eosin along with special staining for AFB by Fite Faraco methods, and Auramine – Rhodamine fluorescent stain, wherever necessary.

HAND ESTAINING PROCEDURE

1. Wax was removed by placing sections in xylene 3-5 minutes.
2. Two changes of absolute alcohol 1-2 minutes.
3. Washed in running tap water 10 minutes.
4. Slides stained with Harris hematoxylin 10 minutes.
5. Dipped in acid alcohol for differentiation.
6. Washed in tap water for 10 minutes (bluing).

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7. Counterstained with eosin 2 mins and washed in running tap water for 2 to 3 mins.
8. Sections were dehydrated in alcohol, cleared in Xylene and mounted with DPX.

Special stain for M. Leprae in paraffin section (Fite-faraco stain)

1. Wax was removed over two changes of xylene peanut oil (3:1) mixture 7 mins for each change.
2. Blotted with fine filter paper.
3. Sections washed in running water for 5 mins.
4. Stained with strong carbol fuchsin for 30 mins.
5. Water wash 2 mins.
6. Decolorized in 1% acid alcohol to reach a pale pink colour.
7. Water wash 2 mins.
8. Counter stained in methylene blue 5 to 6 dips.
9. Water wash until section becomes pale blue.
10. Section dehydrated in absolute alcohol 3 changes.
11. Cleared in Xylene 2 changes and mounted in DPX.

BACTERIAL INDEX (BI)

BI was for study of AFB stain BI was assessed in the same way as in a smear. Using an oil immersion objective the following scale was used.

- 1+ 1 to 10 bacilli in 100 fields
- 2+ 1 to 10 bacilli in 10 fields
- 3+ 1 to 10 bacilli in 1 field
- 4+ 1 to 100 bacilli in 1 field
- 5+ 100 to 1000 bacilli in 1 average field
- 6+ > 1000 bacilli in 1 field.

AURAMINE - RHODAMINE STAIN

1. Deparaffinisation was done with 1:3 peanut oil : Xylene mixture
2. Auramine – Rhodamine stain was used to flood the slides and kept in the incubator at 65 for 15 mins.
3. Slides were washed in running tap water for 2 mins.
4. De-colorization was done in 0.5% HCL in 70% ethanol for 2 mins.
5. Washed in running tap water for 2 mins.
6. Counterstained with 0.5% aqueous potassium permanganate.
7. Washed in running tap water for 2 mins.
8. Dehydrate in absolute alcohol.
9. Mounted in glycerol with coverslip.

Controls – Typical lepromatous leprosy biopsy.

OBSERVATIONS

The present study was carried out in the KARNATAKA INSTITUTE OF MEDICAL SCIENCES, HUBLI, a major referral hospital in North Karnataka from March 1994 to January 2005. During this period 40471 specimens were received in the Histopathology section. Department of Pathology, out of which 782 were skin biopsies. Out of these histopathological study of 135 skin biopsy specimens from skin lesions of leprosy patients was done. The skin biopsies were received from Dept of skin and STD, KIMS, Hubli, and few from other Hospitals in and around Hubli.

Table 1. Showing age and sex distribution in leprosy

Age (yrs)	Sex		Total	Percentage
	M	F		
0—09	4	5	9	6.66
10—19	22	7	29	21.48
20—29	20	10	30	22.22
30—39	16	6	22	16.29
40—49	15	10	25	18.51
50—59	7	4	11	8.14
60 & above	6	3	9	6.66
Total	90 (66%)	45(34%)	135	100

In the present study, patients in the age group of 20-29 years were affected most with 30 cases (22.22%), followed by 10-19 years with 29 (21.48%), 40-49 years 25 (18.51%), 30-39 yrs 22 (16.29%), 50-59 years 11 (8.41%), 0-9 years 9 (6.66%) and 60 years and above with 9 (6.66%) cases.

Males were affected most with 90 cases (66.00%) and females with 45 (34.00%), with Male : Female ratio of 2:1.

Table 2. Showing distribution of leprosy in different religions.

S. No.	Religion	No. Of cases	Percentage
1	Hindu	108	80
2	Muslim	25	18.5
3	Christian	2	1.5
	Total	135	100

Out of 135 leprosy patients Hindus were 108 (80.00%), Muslims were 25 (18.50%), and Christians were only 2 (1.50%) cases.

Table 3. Showing clinical features in leprosy

S. No.	Clinical Features	No. of cases	Percentage
1	Hypopigmented patches	93	68.88
2	Erythematous patches	32	23.7
3	Combined (Hypopigmented & Erythematous)	10	7.41
4	Macules	73	54.07
5	Plaques	17	12.69
6	Papules	8	5.93
7	Nodules	2	1.48
8	Combination of cutaneous lesions	35	25.93
9	Well defined	78	57.77
10	Ill defined	57	42.23
11	<5 Patches	122	90.37
12	>5 Patches	13	9.63
13	Loss of sensation	103	76.3
14	Thickened nerves	65	48.14

The commonest presenting feature was hypopigmented patches seen in 93 (68.88%), followed by erythematous patches with 32 (23.70%), and combinations of both were seen in 10 (7.41%) cases. The most common cutaneous lesions observed were macules in 73 (54.07%), followed by plaques in 17 (12.59%), papules in 8 (5.93%) and nodules in only 2 (1.48%) cases. Various combinations of macula, papule, plaque and nodule were seen in 35 (25.93%) cases. The margins of cutaneous lesions were well defined in 78 (57.77%), and ill defined in 57 (42.23%) cases. Cases showing less than 5 lesions all over the body were 122 (90.37%) cases, and more than 5 lesion in 13 (9.63%). Loss of sensation was seen in 103 (76.30%) cases and thickened peripheral Nerves were present in 65 (48.14%).

Table 4. Showing clinical diagnosis in the present study.

S. No.	Clinical Features	No. Of cases	Percentage
1	TT	26	19.25%
2	BT	66	48.88%
3	BB	5	3.70%
4	BL	5	3.70%
5	LL	6	4.44%
6	IL	12	8.88%
7	Others	8	5.92%
8	Relapse	7	5.18%

Various clinical diagnosis were given, among these borderline tuberculoid leprosy was the most common with 66 (48.88%), followed by tuberculoid leprosy in 26 (19.25%), indeterminate leprosy 12 (8.88%), 5 (3.70%) cases each ;in borderline borderline leprosy ;and borderline lepromatous ;leprosy, and lepromatous

leprosy; in; 6 (4.44%) cases. In rest of the cases, the clinical diagnosis other; than; leprosy was given, which constituted 8 (5.92%) cases. The diagnosis of relapse was given in 7 Cases (5.18%).

Table 5. Showing histopathological types of leprosy.

S. No.	Clinical Features	No. of cases	Percentage
1	TT	39	28.88
2	BT	44	32.59
3	BB	-	-
4	BL	6	4.44
5	LL	9	6.66
6	IL	37	27.40

In the present study the commonest histopathological type of leprosy was borderline tuberculoid leprosy in 44 (32.59%), followed by tuberculoid leprosy in 39 (28.88%), indeterminate leprosy; in 37 (27.40%), lepromatous leprosy in 6 (4.44%) cases only. The borderline leprosy cases were not diagnostic morphologically.

DISCUSSION

In the present study the most affected age group was 20-29 years constituting 30(22.22%) and the second peak in the age group of 10-19 years with 29(21.48%) which are similar to the observations made by Guha et al¹ 108 and 80 (27% and 20% respectively).

Patients in the age group of 40-49 years constituted 25(18.51%) cases, 30-39 years 22(16.29%), similar results were observed by Seghal et al² 307 and 196 (18.48% and 11.8% respectively). Patients less than 9 years 9(6.66%) and more than 50 years (14.7%) were affected least; similar results were seen in the studies of Seghal et al² 43(2.59%) and 123 (7.41%) respectively, and Guha et al¹ 25(6.2%) and 52(13%) respectively.

In the present study there was male predominance with 2:1 male to female ratio which is similar to observatiob madr by Guha et al¹ (1.72:1) and Sehgal V N et al² (4.39:1) while the study done by Chaturvedi et al³ showed female preponderance with a ratio of 1:1.33.

In the present study almost all patients had skin lesions. Among which hypopigmented patches were seen in 91(67%) and erythematous patches were seen in 32(23%), which were similar to in the study done by Kar.P.K et al⁴ with 88 in 14(72.5% and 51.6% respectively). Nodules were observed in 12(8%) cases in the present study, similar results were observed by Verma et al⁵ 1 (7%). Loss of sensation was seen in 103 (76%) of cases in the present study while Kar.P.K et al⁴ and Verma et al⁵ observed 31 and 14 (25.8% and 97% respectively). Nerve thickening was seen in 65(48%)

and trophic ulcer in 3 (2%) cases in the present study while Verma et al⁵ observed 2 and 3 (13% and 20% respectively).

In the present study the commonest histopathological type of leprosy was borderline tuberculoid constituting 44(32.59%) cases, similar results were observed by P.K.Kar et al⁴ and Nadkarni N.S et al⁶ 38 and 969(31.66% and 36.7%) respectively. This was followed by tuberculoid leprosy with 39(28.88%) similar results were seen in the study done by Shenoj S D et al⁷ and Nadkarni N S et al⁶ 22 and 460 (22% and 17.4%) respectively. Intermediate leprosy in 37 (27.3%), similar results were seen in P.K.Kar et al⁴ and Nadkarni N.S et al⁶ (29.16% and 15.9%) respectively. Borderline lepromatous leprosy and lepromatous leprosy constitute very few cases in the present study.

CONCLUSION

Histopathological study of 135 biopsy specimens, which were taken from skin lesions of the patients suspected to be suffering from leprosy, which constituted 0.34% of all biopsies evaluated. All the age groups were affected. Majority of the cases were seen in second and third decade. Patients of both sexes were affected and it was more in males than in females. Patients from different religions were affected among

these most of them belonged to Hindu religion. The most common type of leprosy histopathologically diagnosed was borderline tuberculoid leprosy followed by tuberculoid and intermediate leprosy.

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Socio-Demographic Profile of Organophosphorous Poisoning in A Tertiary Care Hospital

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ABSTRACT

Aim and Objectives: To study the demography, social factors, clinical severity and therapeutic outcome of organophosphorous poisoning.

Design: Descriptive study conducted over a period of six months in emergency medical wards.

Method: Seventy cases of organophosphorous compound poisoning admitted to the emergency department were evaluated in the study.

Results: Forty two (60%) were males, twenty eight (40%) were females. Mean age was 25.82 years. Fifty four (77.1%) cases were attempted suicides and sixteen cases (22.9%) were due to accidental events. Among the suicide attempts, 30 (50.55%) were male patients. The study cases included 34.28% agriculturists and 24.17% coolies. These two groups were in low socio economic status. 42 patients (60%) were brought to the hospital with mild symptoms and 11(15.71%) had severe intoxication. 58 (82.85 %) patients had consumed the poison orally. In 12 (17.15%) patients it was accidental via inhalation and dermal absorption. Seven patients with severe intoxication were in an unconscious state at the time of admission and died of respiratory and neurological complication.

Conclusion: Confinement of these harmful, unsafe pesticides away from houses will reduce the easy accessibility of them for impulsive act of suicide or accidental consumption. Personal protective measures have to be undertaken to prevent accidental poisoning by inhalation and absorption. Measures like banning the most toxic organophosphorous poisoning have to be undertaken. Newer biological means of pest control would go a long way in preventing the exposure to the toxic effects of the presently used compounds.

Key Words: Organophosphorous compound poisoning, Suicide, Intoxication.

INTRODUCTION

Intentional self killing in the form of attempted and successful suicide is on the rise all over the world in recent years. In the last four decades, suicidal rates have been increasing and it is one among the three leading causes of death among 15-44 yrs of age in both sexes.

It is one of the serious social and public health problems. India ranks tenth in suicidal rates with 9.47 per 1, 00,000 population^{2,3}.

Organophosphorous (OP) pesticides are used widely for agriculture, vector control, and Domestic purpose. Despite the apparent benefits, acute organophosphorous pesticide poisoning is an increasing worldwide problem especially in developing countries. Irrational use of the same in higher concentrations also poses risk to agriculturists.

Initially, majority of patients present with florid cholinergic symptomatology. Severe intoxication can lead to bronchorrhea, respiratory depression, fasciculation and altered sensorium^{4,7}.

The present study was undertaken while working in medical wards with the objective of describing socio demographic variables of OP poisoning patients and to study the clinical severity and outcome after treatment.

METHODOLOGY

This is a descriptive study of 70 patients of organophosphorous poisoning, admitted to emergency ward over a period six months in a tertiary care hospital. These patients were brought to the hospital by family or friends. The relevant details were collected from the patient's attendants or patients

themselves in mild cases as well as from records and analysed. Clinical severity were assessed after detailed clinical examination. The patients were followed up till discharge from the hospital to look for the outcome of therapy.

RESULTS

The major characteristics of these 70 patients were as follows:

60% of patients were males and 40% were females with the age & sex distribution as shown in the Table 1.

Table 1. Age and sex distribution or organophosphorous poisoning cases:

Age	Male	Female	Total	Percentage
11-15	1	1	2	2.86
16-20	14	10	24	34.29
21-25	9	9	18	25.71
26-30	5	4	9	12.86
31-35	3	3	6	8.57
36-40	6	--	6	8.57
41-45	2	1	3	4.28
46-50	2	-	2	2.86
Total	42	28	70	100.00

Most patients were between 16 to 25 years of age. Mean age 25.82 yrs.

Table 2. Occupations of the patients

Sl.No.	Occupation	Male	Female	Total	Percentage
01	Agriculture	24	-	24	34.28
02	Coolie	10	9	19	27.14
03	Housewife	-	15	15	21.43
04	Student	3	3	6	8.57
05	Mill worker	1	1	2	2.86
06	Tailor	1	-	1	1.43
07	Carpenter	1	-	1	1.43
08	Attender (Govt)	1	-	1	1.43
09	servant	1	-	1	1.43
	Total	42	28	70	100.00

34.28% were agriculturists belonging to middle and lower income group. 24.17% were coolies 21.43% were housewives.

Among 28 females with op poisoning, 53.57% were house wives.

Portal of entry: 58 (82.85 %) patients had consumed the poison orally. In 12 (17.15%) patients, the poisoning was through the skin by contact and also inhalation during spraying in the agricultural field.

Table 3. Severity of poisoning

Sl. No	Grade	Number	Percentage
1.	Mild	42	60.00
2.	Moderate	17	24.29
3	Severe	11	15.71

Categorization of severity of poisoning

These cases were grouped in to mild, moderate and severe according to the severity of clinical symptoms and signs as follows.

Mild: 42 cases (60%) were found to have mild illness. In this group, the patients had some or all of the following features - Nausea, Vomiting, epigastric pain, Sweating, restlessness and constricted or normal pupils, without obvious changes in the pulse, Respiration and blood pressure. These patients did not have any abnormal signs in the lungs and heart and recovered within 2-4 days.

Moderate: 17 cases (24.29%) were found to have moderately severe illness. In all these cases some or all of the following features in addition to that of the mild cases were found. Confusion, headache, muscle weakness, respiratory distress, circulatory failure and fasciculation. All these patients recovered within 10 days.

Severe: 11 cases (15.71%) were found to have severe illness. In all these cases, pulmonary edema, loss of consciousness and circulatory failure were present. 6 patients were semiconscious and 5 cases were unconscious. 7 patients in this category died.

DISCUSSION

Organophosphorous compounds are used extensively as insecticides in agriculture.

Though they are a boon to farmers, they are misused for suicidal purposes. Organophosphorous Compounds account for 2 million suicide attempts and 1 million accidental poisoning each year throughout the World.

It is the most significant form of poisoning in Asia, especially in agricultural countries like Pakistan, India and Srilanka^{3,1}.

The number of suicides in India during the decade (1998-2008)has recorded an increase of 19.4%. ie from 1,04,713 in 1998 to 1,25,017 in 2008².

In this study most of the victims of poisoning were in the age group 16-25 years similar to study at Ahmadabad, India, with a maximum number of patients between 21-30 years and study by Sulemaan M.I in Pakistan where most of the victims were between 15-24 years and Krupesh et al (mean age 24.8 yrs)⁵. Various factors like stress, unemployment, family conflict, marital problems may be the cause for frequent poisoning in this age group.

Overall male to female ratio in this study was 3:2 which is similar to other studies which also show a male preponderance^{3,1,6}. According to the attempted

suicide proportion was 46.4% in men and 75.4% in women⁸.

Accidental poisoning due to inhalation and absorption through the skin was found to be very high (17.5%) in contrast to negligible cases (1.61%) reported by krupesh et al⁵.

Maximum patients in this study belonged to lower income group (58.45%) and 90% of cases were non-fatal similar to 82% non fatal cases of attempted suicide reported by Logaraj ET al¹.

The proportion of fatal outcome reported in other studies varies from 10% - 17.86%^{4,1,5}. Though none of our patients had history of previous attempted suicide there is a need for strengthening and counseling of these patients and their families to prevent further attempts, as Suresh et al have reported 24% patients attempting to commit suicide again.

CONCLUSION

Confinement of these harmful, unsafe pesticides away from houses will reduce the easy accessibility of them for impulsive act of suicide or accidental consumption. Personal protective measures have to be undertaken to prevent accidental poisoning by inhalation and absorption. Measures like banning the most toxic organophosphorous poisoning have to be undertaken.

We should hope for newer safe methods of pest

control which will put a halt to organophosphorous compound poisoning.

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Usage of Multimedia Learning Modules for Teaching Human Microanatomy and its Assessment Through OSCA/OSCE

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ABSTRACT

With the advent of the multimedia and inclusion of computer assisted instruction in an anatomy course has permitted the acquisition of the course objectives in a reduced amount of time. Keeping this in mind a study was done in department of Anatomy of Subharti Medical College to assess the students on their ability to understand microanatomy when taught on microscope in comparison to teaching on computers.

The performance was also evaluated on basis of OSCA/OSCE in comparison to diagram making which is a conventional method of assessment. Results obtained were statistically evaluated and it was found that on one hand teaching should include both conventional method of teaching i.e. through microscope as well as through computers while on the other hand OSCA is definitely a better means of evaluation.

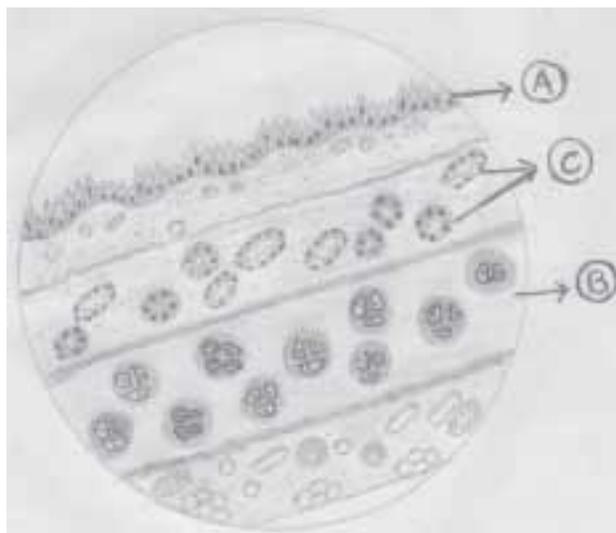
Key words: Multimedia Learning Modules, OSCA/OSCE

INTRODUCTION

Human anatomy is one of the most important components of medical student curriculum. Uptill now books have been the primary medium to propagate knowledge in microanatomy and there are many excellent textbooks. Some of them give both detailed description of human anatomy and list of anatomical variations (Testut, 1896)¹ others concentrate on realistic illustrations (Bannister et al 1995,² Sobotta 2000)³

Anatomy is a field where spatial visualization is of importance. Functional anatomy is a strongly three dimensional matter. Students must learn particular anatomical structures, their function, and their spatial relationships with the surrounding structures. Computer assisted learning is growing quickly within academic programs. It makes teaching simpler and a time saving process. So a study was undertaken in our department at Subharti Medical College to assess the students on their ability to understand microanatomy when taught on microscopes in comparison to teaching on computers.

Similarly a study was also done to assess the performance of students by diagram making which is a traditional method of assessment in comparison to objective structured clinical assessment (OSCA) (Fig. 1) which has evolved over the ten years its been in use.



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- | | |
|---|-----|
| Q1 Identify the given slide | 1 |
| Q2 Identify the structure labeled A & give the classification to which it belongs | 1+3 |
| Q3 Identify the structure labeled B and give two other examples where it is found | 1+1 |
| Q4 Identify structure labeled C and give its function | 1+2 |

The OSCA format is used in many medical schools and can be considered generically as an assessment which uses a series of stations with students performing musical chairs as they rotate through the stations and tackle the set tasks. OSCA can be used in all years of the course for assessing clinically relevant content areas and skills which require a visual trigger or a hand on technique. Example includes a microscope slide (histology or pathology) a gross anatomy or pathology specimen, a diagnostic imaging material, a clinical photograph or a simulated patient.

MATERIAL & METHOD

A proforma was distributed among 200 first year students (100 MBBS & 100 BDS) of Subharti Medical College Meerut. They were asked to give their opinion regarding the method of teaching which has enabled them better understanding of the subject (Table I) and also about the method of assessment which enables them to gain more marks and is a better test of their knowledge of the subject (Table II). Students were also asked not to disclose their name if they thought it would influence the results.

Table I

(1) Teaching:

(a) Through Microscope Excellent Good Average Poor

(b) Computer Teaching fitted With digital camera & Microscope Excellent Good Average Poor

Teaching	Excellent	Good	Average	Poor	
Through Microscope	116	72	6	-	194
Computer teaching	105	79	9	1	193

(Student t test applied) (P> .05)

TABLE II

(2) Assessment:

(a) Diagram Making Excellent Good Average Poor

(b) OSCA Excellent Good Average Poor

Results:- Out of 200 students, 194 replied

Teaching	Excellent	Good	Average	Poor	
Diagram Making	78	106	10	-	194
OSCA (Objective structured clinical assessment)	120	61	13	-	194

(Student t test applied) (P<.05)

DISCUSSION

Anatomy the structural basis for life, provides a unique and necessary perspective on the human body from molecular to the macroscopic stage (Marks 1996)⁴. A solid foundation of anatomy is the best preparation for an effective physical examination & for safe, efficient basic clinical procedures. Teaching of anatomy has attracted recent attention due to changing modern teaching methodology globally.

Previous studies have shown that on line education is an efficient tool for improving knowledge distribution using both multi media technologies to

create educational support (Benbunan- Finch 2002)⁵ and the internet to distribute the knowledge (Smith et al, 1999)⁶. Indeed most departments of anatomy do not have the resources to start full soft ware development, they just need inexpensive development of MLM's (Multimedia learning module) to illustrate their classes. This economic constraint was previously mentioned by Lozanoff et al (2003)⁷. Many institutions have integrated computer assisted instruction in their curriculum (Mattingly & Barnes 1994⁸, Fitzharris 1998)⁹ with the computer assisted instruction being locally created or purchased commercially (Walsh & Bohn 1990¹⁰, Standford et al 1994)¹¹. The approach of using

computers to successfully support an anatomy course is therefore not unique.

In present study students have projected their views both in favour of teaching human microanatomy through microscopes as well as through computers (p value > .05). Thus an effort should be made to incorporate MLM into the regular teaching schedule of teaching microanatomy via microscope. It must be emphasized that it is unlikely that MLM's will fully replace traditional educational tools (Lozanoff et al 2003)⁷ even if they appear to be superior. The main reason would be the lack of communication between the academic staff and the students if MLM's were used exclusively.

On the other hand assessment is central to a curriculum in which student learning is substantially self directed as it provides students with opportunities to test the adequacy of their learning¹². The potential for assessment to either weaken or strengthen educational goals was recognized at an early stage leading to a commitment to formative assessment¹³ and the development of assessment instruments which would support, rather than undermine student learning.¹⁴ The concept that assessment should be a fair and open process was accepted for the inception of the medical school.

Those contributing questions to written assessment papers are required to prepare a model answer and to specify the minimum level of competence which must be achieved by students to be considered satisfactory. Thus objective structured clinical examination (OSCE) has become a respected and widely used tool for the assessment of clinical competence in medical education¹⁵. In our study students showed their preference for OSCA (p value significant <.05). It was found that OSCA/OSCE was a better tool for assessment of knowledge of students in comparison to their diagram making.

These findings were corroborated by Barman A (2009)¹⁶ and Schoonheim Klein ME et al (2006)¹⁷. According to them implementation of an OSCE in undergraduate teaching appears to stimulate learning, resulting in greater achievement of specific clinical competence and a greater level of realistic self assessment.

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Clinico- Psychological Profile of Acne Vulgaris Among Professional Students

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ABSTRACT

Background: Acne Vulgaris (AV) is one of the most common disorders of skin especially affecting young population. Because of its visible nature and the resulting scarring and hyper pigmentation, acne is associated with a significant psychosocial impact on the student's life that could be much more than any other medical condition. Very few Indian studies have been under taken to study profile of AV amongst professional college students and its psychological impact on them.

Aims & Objectives: Present study was conducted to determine profile of acne vulgaris in professional college students and to study psychological impact of acne among them.

Material & Methods: The study was conducted in 240 professional college students with acne vulgaris attending dermatology out patient department of medical college, Greater Noida, India. The parameters included age, sex and age at the time of onset of AV, site of acne, number and type of acne lesions (comedones, papules, pustules, cysts), grading of acne & its psychological impact.

Results: Age group of patients was 16-22 years. Male to female ratio was 1.76:1. Face was involved in all patients followed by back, chest, arms & neck. 84 patients (35%) had grade I acne, 60 (25%) had grade II, 64 (22%) had grade III while 44 (18%) had grade IV acne Vulgaris. Out of total 240 students, 53% had feeling of low self-esteem because of acne and 40% revealed they avoided social gatherings and interaction with opposite sex because of acne. Suicidal ideation was found in 8 students (3%) while 28 students thought acne would lead to difficulty in getting them a good job.

Conclusion: This study brings out the clinical profile of acne Vulgaris amongst students and psychological impact of acne on them.

Key Words: *Acne vulgaris, Grade of acne, Psychological impact.*

INTRODUCTION

Acne Vulgaris is a common, chronic inflammatory disease of the pilosebaceous unit producing comedones, papules, pustules, cysts and scars¹. The majority of patients with acne begin to develop lesions at or around puberty and the onset is on average a year or two earlier in girls than in boys. Grading system based on the clinical appearance of the lesions, site of lesions and lesion counting are useful in assessing the severity of acne Vulgaris. Owing to its visible nature and the resulting scarring, acne is associated with a

significant psychosocial impact on the patient's life that could be comparable to the psychosocial impact of any other major medical condition². On the other hand, psychosocial distress itself can be a provocative factor in acne flares. Acne sufferers also have been shown to have higher levels of anxiety compared with a control population. Studies have further found that school-going adolescents with acne feel embarrassed because of their facial appearance, are socially isolated and more self-conscious than their companions. The disease if left untreated can cause severe emotional distress especially among teenagers.

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MATERIAL AND METHODS

Total 240 professional college students (medical, engineering and business administration) with acne vulgaris attending dermatology out patient

department of Medical College, Sharda Hospital, Greater Noida, India, who consented to participate were included in the study. Exclusion criteria was

- Patient with drug induced acne or other acneform lesions.
- Female patients with signs of hyper androgenicity. (Hormonal acne)
- Patients with some other associated chronic medical disorder like hypothyroidism, tuberculosis, diabetes etc.

The study was conducted from December 2009 to June 2010. Parameters evaluated included age, sex, age at the time of onset, duration of lesion, site of lesions, number and type of acne lesions (comedones, papule, pustule, nodule), grading of acne and psychological impact. Acne vulgaris was graded using a simple grading system taking into account the predominant lesion to grade acne, which classifies it into four grades.

- Grade I- predominantly comedones
- Grade II- predominantly papules
- Grade III- predominantly pustules
- Grade IV- nodulo-cystic acne & scarring

Questionnaires were provided to students regarding psychological impact of acne on their life.

Simple proportion and percentage was used to represent the data collected.

RESULT

Two hundred forty students having acne vulgaris attending skin OPD were included in the study. The age group, which was studied, was 16-22 years. Of the 240 patients 84 females (35%) and 148 (65%) were males. Male to female ratio was 1.76:1.

Face was involved in all the patients with acne vulgaris. However, face alone was involved in 202 (65.4%). This was followed by the involvement of the back (28.2%), chest (20.1%), neck (9.4%) and arms (10%).

As shown in chart-1, the most common type of lesion in this study was comedones, present in all patients. They were followed by papules in 140 (58%) patients while pustules were found in 72 (30%) number of patients. Nodules and cysts were found in 50(21%) patients. (Figure 1)

A total of 84 patients (35%) had grade I acne, 60 (25%) had grade II, 52 (22%) had grade III while 44 (18%) had grade IV acne Vulgaris.

Post-acne scarring was seen in 100 patients (42%). Cheeks were the most common site of post-acne scarring, being involved in all the 100 patients.



Fig. 1: Patient with grade IV acne. Nodules, cysts and comedones are seen

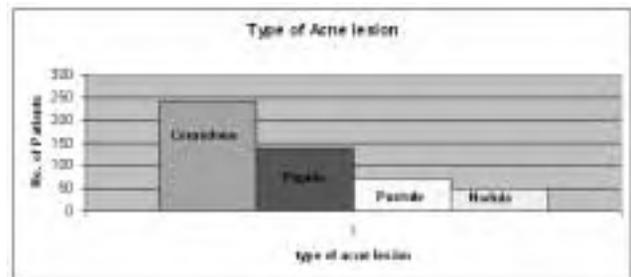


Chart 1: Type of acne lesion



Fig. 2: Post acne scarring

Post-acne hyper pigmentation was observed in 140 patients (58%). Seasonal variation was observed only in 42 patients (18%); 35 patients (15%) exacerbated in summer and 7 patients (3%) in winter.

Psychological impact- Total of 128 (53%) students had feeling of low self-esteem because of acne. Ninety-six students (40%) revealed they avoided social gatherings and interaction with opposite sex because of acne. Forty-nine out of total 84 females (58%) had social inhibition because of acne. Suicidal ideation was found in 8 students (3%). Twenty males and eight females

students felt that they had less chance of getting good scoring in their placement interview because of acne. (Refer- chart 2)

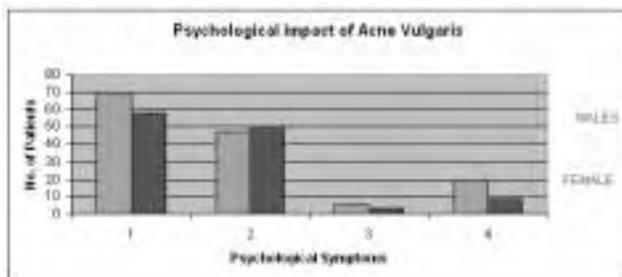


Chart 2: Psychological impact of acne

Psychological Symptoms	Males	Females	Total
1. Felling of low self esteem	70	58	128
2. Social inhibition	47	49	96
3. Suicidal ideation	5	3	8
4. Fear of not getting good placement	20	8	28

DISCUSSION

Acne vulgaris is a chronic condition that is more or less universal in adolescence. An individual is more likely to develop acne than any other skin disease¹. Adityan B et al. in their study on acne vulgaris in south Indian population reported 1.06% while Al-Ameer and Al-Akloby, had reported 11.2% prevalence of acne patients in the new patients attending their hospitals^{3,4}. In our study mean age of presentation was 18 years in females and 19 years in males. Al-Ameer and Al-Akloby⁴ also observed similar age of presentation in their study. Kane et al. in their study noted that the mean age of presentation of their patients was 25.58 years⁵. Due to earlier onset of puberty in females, acne appears earlier in them, it reflected in our study also.

Face is the most common site of acne vulgaris, as acne is a disorder of pilo-sebaceous unit, which are found in abundance over face. All of our patients (100%) had involvement of face, which was followed by back (28.2%). Chest was involved in 20.1%, neck was involved in 9.4% and arms were involved in 10%. Adityan B et al. in their study on acne vulgaris also observed similar findings. Acne vulgaris is a polymorphic disease characterized by presence of comedones, papules, pustules and cysts. Most common lesion found in our study was comedone (100%). Kilkenny et al, Cunliffe et al and Adityan B, in their respective studies also reported that comedones were the most common type of lesion^{3,6,7}.

In our study, we graded the severity of acne vulgaris, using a simple and quick system of classification using a four-grade system⁸. In our study

grade I acne was most common, as previously established by other studies. As comedone is the most common acne lesion, grade I is rightly the most common grade. Adityan B et al and Kane et al also noticed similar finding in their study^{3,5}. Few studies have shown lower incidence of scarring in their acne patients^{6,9}. We noticed high incidence of post acne scarring (42%) as well as post acne hyper pigmentation (58%). Adityan B et al, in their study also noticed high incidence of post acne scarring in south Indian population³.

Post inflammatory hyper pigmentation is a common complication of acne vulgaris, particularly in pigmented skin. Acne has traditionally been accepted in the society as a self-limiting condition. It is the complication of acne in the form of hyper pigmentation and scarring that warrants timely treatment. We observed high (58%) incidence if post-acne hyper pigmentation. Kane et al (67.7%), Yeung et al (52.6%) and Taylor et al (52,6%) also observed higher post acne hyper pigmentation in their respective studies^{5,9,10}. Adityan B et al in their study in south Indian patients observed lower incidence of hyper pigmentation³.

Studies done in the past have shown conflicting results regarding seasonal variation in acne vulgaris. In our study seasonal variation was observed only in 42 patients (18%); 35 patients (15%) exacerbated in summer and 7 patients (3%) in winter. Previous Indian study done by Adityan B et al also reported similar findings while Al-Ameer and Al-Akloby in their Saudi Arabian study has shown the reverse trend, that acne exacerbates in winter, and often improves during the summer months^{3,4}.

Our study observed great psychological impact of acne on college students. Total of 128 (53%) students revealed feeling of low self-esteem because of acne. Ninety-six students (40%) said they avoided social gatherings and interaction with opposite sex because of acne. College time is very crucial for students, as it affects overall personality of the student in his future professional life, so acne may have great impact on student's life. Forty-nine out of total 84 females (58%) had social inhibition because of acne. In our study suicidal ideation was found in only 8 students (3%). Similar study done by Rehn LM et al reported much higher (14.5%) suicidal ideation tendency¹¹. This is a positive trend observed by us. Twenty males and eight females students felt that they had less chance of getting good scoring in their placement interview because of acne. Their fear to some extent can be justified as there has been evidence to support that employers are inclined to favour those with clear complexions when making job offers¹².

CONCLUSION

To conclude, our study included 240 patients with acne vulgaris. Face was involved in all patients followed by back, chest, arms & neck. 72 patients (30%) had grade I acne, 60 (25%) had grade II, 64 (27%) had grade III while 44 (18%) had grade IV acne Vulgaris. Out of total 240 students, 53% had feeling of low self-esteem because of acne and 40% revealed they avoided social gatherings and interaction with opposite sex because of acne. Suicidal ideation was found in 8 students (3%) while 28 students thought acne would lead to difficulty in getting them a good job. Thus acne vulgaris has lot of negative psychological impact on students, which included low self-esteem, social inhibition and fear of not getting a good job. Our study thus brings out the clinical profile and psychological impact of acne vulgaris in students attending a teaching hospital in north India.

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CONFLICT OF INTEREST

None.

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Adolescents: Friendship and health

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ABSTRACT

This study is an attempt to explore Iranian adolescents' perspectives on friendship and health. Purposeful sampling was used (n=41). Interviews were recorded and transcribed for further analysis. Results showed three main themes, two of which are the focus of this paper as: positive and negative impact of peers, friendship with the opposite sex.

To maintain a healthy society, considering the multilayered dimensions of adolescence and recognition its characteristics is critical for families, teachers, curriculum planners, health workers and policy makers

Key words: *Adolescence, Content analysis, Health, Peer group, Qualitative approach*

INTRODUCTION

A Large body of research has investigated different aspects of adolescence health^{1, 5, 7, 13, 15, 23, 24}, among these, a study on depressive symptoms and risky behaviors shows that depressive symptoms of adolescence are significantly associated with parental depression, family dysfunction, problems with peers, low self-esteem, alcoholism, feminine gender, and large family size¹. Furthermore, in comparison to their peers, adolescents from poor families, with either one or both parents unemployed, inadequate emotional support, and frequent conflicts significantly engage in more risky behaviors²³.

Moreover, during adolescence, growth, development, and adaptation to developmental changes of this era, often take place within an environment of drug abuse, increased sexual relationship and weakened family structure²⁴. Among adolescence developmental changes, the tendency to

become independent from family members, as well as, an increased inclination to follow peers is remarkable. The influence of peers on each other as a normal evolutionary process and a prerequisite for socialization in adolescence, as an identity-seeking period, can bring harms⁷ due to separation from family and significant others and joining to peers. Considering the vulnerability of the youth and the fact that relationship with peers can increase this vulnerability, addressing the subject of friendship in adolescence is of utmost importance.

Friendship is crucial to psychological health of adolescents⁵. Accordingly, another study¹⁵ investigated the association between social relations and psychological health complaints, and emphasized that stressed relations are strongly associated with psychosomatic complaints¹⁵. Moreover, friendship with deviant friends increases the risk of antisocial behavior during adulthood⁸. Furthermore, there is evidence that insufficient family and friend support, peer victimization, physical and/or sexual abuse, and emotional neglect positively correlate with adolescence suicide¹³.

However, the existing literature on adolescence holds little qualitative evidence available on the youth friendship and health, especially in Iranian context. In addition, evaluation of the youth lived experiences and deep emotions, as a risk-prone group, are not easily

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achievable by the current quantitative research.

THE IRANIAN CONTEXT

Iran with more than fifteen million adolescents, approximately 30% of the country’s total population, is one of the youngest countries in the world¹⁸. The tendency to show risky behaviors among the youth, confronts countries with a challenging situation. Within the Iranian context, friendship has an influential role on the youth, and friends are crucially important to live a healthy or unhealthy life. In Iranian culture friendship is considered vital and family is regarded as a sacred being; therefore, sometimes, adolescents may keep their relationships, especially with the opposite sex, secret from their immediate family members. Furthermore, in Iran, due to social and educational development, and changing employment policies, Iranian adolescents live in a transitional period; however, they still prefer to enjoy more family emotional support, and need to be attached to their family members while seeking more independence²⁶.

In this section, we will report the results of some Iranian studies on adolescents and their peers. A comparative study on adolescents’ attachment to mother, father, and peers in Shiraz guidance schools has revealed that there is a positive correlation between age and attachment to peers, while this attachment to father and mother shows a negative correlation²⁶. A quasi-experimental study compared the effects of teaching breast self-examination by peers and health care personnel on students’ knowledge and attitude, the results of which showed that the mean score of knowledge in the group trained by their peers was higher than those trained by health care personnel². Moreover, the results of a longitudinal quasi-experimental study which employed a skill-based intervention to prevent and reduce substance abuse among urban adolescents in Tehran, showed that the intervention significantly decreased substance abuse, improved knowledge, changed attitudes, improved say NO skills, and increased level of self-control, self-efficacy, and perceived susceptibility among the intervention group; whereas, level of self control and attitudes against substance abuse among the control group were deteriorated³. In another study on the influence of peers, adolescents who met their friends regularly and had a stronger tie with them, brushed their teeth twice or more a day. In addition, girls were significantly more likely to brush their teeth; however, they had weaker peer social networks than boys¹⁰. According to the importance of the issue, this qualitative content analysis is an attempt to explore adolescents’ perspectives on health and friendship.

METHODS

In-depth, open-ended semi-structured interviews were carried out in were conducted in one or two sessions within an average of one hour natural settings through purposive sampling, which were tape-recorded and, transcribed for further analysis. To understand, interpret and conceptualize the meaning in qualitative data^{14,17}, after each interview, the content is read and reread for several times. Then, it was broken down into smaller meaningful units called codes, which were categorized into sub-themes and themes, through constant comparative analysis till a sense of satisfaction to researchers and reasonable stability toward data is reached¹⁷.

TRUSTWORTHINESS OF THE DATA

Data trustworthiness was confirmed by prolonged engagement, member, peer, and external check. The maximum variation of sampling is used for data conformability and credibility³⁰.

ETHICAL CONSIDERATIONS

The ethics research review board of Tehran University of Medical Sciences, Nursing and Midwifery School approved the research ethical considerations. all aspects of ethical guidelines with respect to human rights were applied including consent forms were also secured.

RESULTS

The findings are explained according to the demographic data and the emerged themes (Table 1 and 2).

Table 1. Demographic data

Demographic Characteristics	Number	Percent
Sex:		
Male	17	41
Female	24	59
Education		
Secondary School	14	34
High School	22	54
University	5	12
Employment		
Student	36	87
Worker	4	10
Shopkeeper	1	3
Total	41	100

Table 2. The Emerged Themes and Sub-themes

Consequences of relationship with peer group	* Positive effects * Negative effects
Friendship with the opposite sex	* Reasons * Limitations

The positive and adverse effects of peers

The positive or negative outcomes of friendship and its influence on the onset of undesirable habits such as smoking, alcohol consumption, and drug abuse have emphasized by the participants. Male participants mostly reported undesirable and unwanted behaviors under the influence of their peers (peer obedience), while there is seldom a report on their positive influence:

"I was a villain... my friend encouraged me to share our secrets and deeds. He stopped me from doing mischief. He accompanied me to mosques and religious gatherings....to attend a mosque was a good experience; I enjoyed attending religious places, because it was a very unique experience." 15, 16 year old boy

Friendship with the opposite sex

Developing friendship with the opposite sex was one of the most challenging issues for which participants brought up and explained various motives. A number of participants mentioned modernity and its challenges, satellites and the internet, seeking affection and decreased family relationships as a grownup, as the main reasons for developing relationship with the opposite sex, while others emphasized the need to know others, and the need to feel as a grownup.

In this regard, one of the adolescents mentioned:

"Some girls seek friendship with boys because of modernity and to be more stylish, it is "a must" for them and they want to follow modes; while others seek affection, and when a guy loves them, they become attracted to him. However, in fact, they never receive what they want." P. 22, 18 year old girl
Friendship with the opposite sex might provide a context for development of various social deviations ranging from familial conflicts, educational decline, and emotional dependency to possible transmission of sexual diseases, some of which were reported as the worst consequence of illegal relationship with the opposite sex.:

"These friendships usually damage our school work. Parents do not agree friendship with a girl friend; we cannot talk to them about friendship with the opposite sex. In our country, falling in love with an opposite sex should be kept as a secret and it is a misery." P.12, 18-year-old male.

"Today, one of the diseases that threaten life of the youth is AIDS that can be acquired from sexual relationship between adolescents." P.13, 17-year-old-boy.

In addition, imposing limitations on the relationship between the opposite sexes and forbidding them will bring about unwanted, undesirable effects:

"Being restricted is ridiculous, cause forbidding these relationships, worsen the situation." P.23, 16 year old girl.

DISCUSSION

Content analysis was according to the qualitative methodology. The first extracted theme, has two sub-themes: positive and negative effects of friendship on adolescents, the participants emphasized the role of peers which is similar to what has been reported in the literature^{9,11,15,27,28}. Moreover, they stated that they got a sense of "energy and euphoria, psychological vitality, superiority and a sense of identity" through interaction with peers that act as a psychological support for them.

Abnormal friendship leads to higher rates of complicated behaviors in adolescents, and interaction with deviant peers leads to emergence of antisocial behavior in early adulthood⁸. In contrast, it is shown that peers were successful to run a stop smoking program in schools of both genders⁴. Therefore, increasing body of knowledge about coping with peer pressure may provide a particular promising route of intervention in adolescents' substance use and abuse²⁴.

Participants of the study stated that friendship with the opposite sex is one of their main health challenges. In addition, the male participants of the study narrated more negative experiences due to their relationships, because in Iran they are less limited, have more joys, and can spend more time with peers, than females. Although, friendship with the opposite sex in Iran is significantly less popular than Western countries; yet, transition from a traditional to a modern society and signs of adolescent's identity crisis add to the severity of the problem²¹. In Iran, according to the socio-cultural-religious views, pre-marital relationship with the opposite sex is still a taboo; but, satellites and the internet propagate the western model of relationship with the opposite sex, especially for the youth.

Culture and various contextual factors affect the extent of relationship between the sexes, these may include, a range from simple friendship to having romantic or sexual involvement⁷. According to the participants, transmitted diseases acquired from a sexual relationship are the worst consequences of secret premarital friendships. Adolescents are highly at risk to acquire AIDS. And, the program of "Healthy People till 2010" has addressed this issue³¹. Recently,

in Iran, AIDS trend has changed from addiction-oriented to sex-oriented³³.

Early or, increased sexual activity, having too many sexual partners, pregnancy, transmitted sexual diseases, alcohol consumption, cigarette smoking and drug abuse are amongst the problems that adolescents face. Continuation of these behaviors, increase their importance in adulthood^{16,28,29}. The widening gap between generations, social trends, modernity, and more virtual communication along with enculturation are factors related to adolescence health that extremely affect traditional families²⁰. Also, it is reported that religious beliefs are associated with lower risk of smoking and drinking in adolescents²⁵. The religious and traditional structures of Iranian society to a certain extent control the development of high risk friendship with the opposite sex. However, because of the internet and other advanced communication systems that significantly influence the youth, there is a change of patterns in premature sexual relationships among adolescents which from the Iranian cultural and religious point of view is neither accepted nor legal.

There is a belief that premature sexual activities predispose adolescents to the major risk of unpleasant unwanted effects²⁸. A great number of adolescents in the Western countries, during high school, have more than one sexual partner, the result of which is an increase in sexually transmitted diseases among 13-21 year old adolescents^{12, 22} which is the most paramount goal of the World Health Organization to overcome³¹.

CONCLUSION

Health practitioners and nurses are in a position to encourage health promotion by assessing lifestyle patterns among the youth and to facilitate positive and to decrease negative behaviors⁶. There is an urgent need for teachers, policy-makers, and health practitioners to be aware of adolescence needs. Furthermore, to consider adolescence needs, according to their socio-cultural contexts, in curriculum development is of an utmost importance.

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Thermographic Imaging - A Brief Review

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INTRODUCTION

The normal internal temperature in resting man is maintained within very narrow limits inspite of wide variations in environmental temperature. The human skin is almost a perfect emitter of infrared radiation and its temperature varies widely as a result of environmental changes¹⁵. By studying the skin temperature patterns from the patient's body, the diagnosticians gain a direct index of the metabolic activity in the various parts of the body¹⁰.

Thermography (Gk therme-heat, graphein-to record) Thermography is a technique for sensing and recording on film hot and cold areas of the body by means of infrared detectors that reacts to blood flow.

Thermography makes use of measuring techniques, which portray surface temperature distributions pictorially, and this is accomplished either with liquid crystals or infrared scanning equipment¹. It gives us a functional perspective based on physiology and stress response¹⁰.

"We can finally see what the body is doing before it becomes dysfunctional enough to create an irreversible problem".

HISTORY OF THERMOLOGY

The importance of deep body temperature as an indicator of disease has been known for centuries. HIPPOCRATES used his right hand to judge the skin temperature of his sick patients. In 1592, GALILEO GALILEI was credited with inventing the Galileo's thermo scope. In 1611, SANTORIO SANCTORIUS developed the first thermometer with 110 grades.

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It took however nearly 300 years before WUNDERLICH introduced fever measurements as a routine clinical diagnostic procedure. This method took decades to become firmly established and is now customary in all hospitals through out the world to take daily body (core) temperature measurements on all patients.¹

METHODS OF OBTAINING THERMAL IMAGES

Thermal images can be obtained mainly by two methods

1. Direct contact methods: Ex. Liquid crystal thermography (LCT)
2. Non-contact methods: Ex. Infrared thermography (IRT) - includes Area telethermometry, Electronic thermography, Infrared telethermography (ITT), or Digital infrared telethermographic imaging (DITI).¹

CONTACT METHOD

LIQUID CRYSTAL THERMOGRAPHY

Liquid crystal area thermometers use flexible rubber sheets within which cholesteric crystals are embedded. There are several layers of the crystals in the commercial sheet materials, which are mounted in a frame. The liquid crystal elastic sheet, are applied to the surfaces of the body. After placement, the crystals change from their neutral color at room temperature in response to the surface temperature of the body with which they are in contact. The color distribution over these sheets represents the temperature distribution over the area of skin in contact with the sheet. The resultant color display is then photographed. It is this photograph that becomes the thermogram, which is used for diagnostic evaluation¹.

ADVANTAGES

- a. Portable
- b. No contact between the skin and the monitoring device during studying skin temperature
- c. Easy to apply
- d. No electric requirements

Thermal device	Thermal sensitivity (°C)	Estimated cost (\$)	Estimated date of inception	Major advantages	Major disadvantages
Direct Contact Methods					
1. Hand					
2. Mercury thermometer	2 – 3 0.1 – 0.2	0 2	100's B.C. 1500's	- Convenient - Inexpensive, convenient	- Subjective - Requires contact
3. Thermistor, thermocouple	0.01 – 0.02	2000	1930's	- High accuracy, convenient	- Requires contact
4. Liquid crystal thermography	0.3 – 1.0	5000	1960's	- Provides thermal image	- Requires contact
Non-Contact Methods					
1. Computerized Infrared telethermography	0.05	75 000	1970's	- Non-contact static image, computer data analysis	- Expensive and static image
2. Advanced Infrared computerized telethermography	0.005	100 000	1990's	- Non-contact dynamic image, computer data analysis	- Expensive

- e. Considerably less expensive than electronic telethermography units

DISADVANTAGES

- a. Low or poor thermal sensitivity (0.3 – 1 °C).
- b. Skin surface has to be blackened
- c. The process is technique sensitive
- d. Require carefully timed skin contact to record a reproducible temperature distribution
- e. The spatial resolution of the liquid crystal display is poor (> 5mm)



Fig. 1: Full body Thermographic Image



Fig. 2: Thermo graphic image of face

In spite of its severe limitations, liquid crystal thermography has been claimed to yield meaningful results in the evaluation of thermal abnormalities of the face due to orofacial disorders.

NON-CONTACT METHOD

INFRARED THERMOGRAPHY

JOHN FREDRICK WILLIAM HERSHEL recorded infrared wavelengths and introduced the term "Thermograph".



Fig. 3: Thermographic image of hands



Fig. 4: Thermographic image of legs



Fig. 5: Thermographic image of inflamed face

THE EQUIPMENT

i. Detector system

There are two categories of detectors. They are

- a. **Thermal detectors:** Thermal detectors suitable for clinical use sense radiation by the temperature rise in the absorbing element, which affects some temperature-sensitive property. Pyroelectric detectors have the advantage that they can detect long wavelength radiation without detector cooling which is required for photon detectors. Recently pyroelectric detectors have been incorporated into VIDICON type TV tubes.¹³

b. Photon detectors:

Indium antimonide (InSb) and cadmium mercury telluride (usually referred to as CMT) are the photon detectors most often used in clinical thermography equipment.

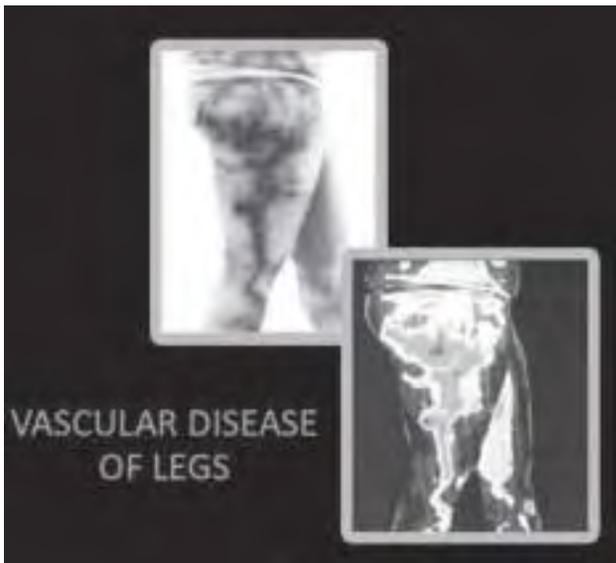
ii. Imaging Systems

Scanning of the scene in front of the detector can be accomplished by a variety of ways example, the Aga Thermovision 680 Medical camera or other systems like oscillating mirrors and rotating multi-sided mirror drums. The thermal picture is usually displayed on a television image tube.

More recently, serial scan systems have been developed in each detector in a linear array scan in sequence over every point in the scene, and the signals are appropriately delayed and added to form the image.

iii. Display systems

The signal derived from the detector is amplified and used to modulate the intensity of the electron beam of a TV monitor type picture-tube display unit. The thermal image shows relative temperature differences in a continuous range of gray tones from black to white. The hot area to be displayed may be white or black (inverted mode) depending on the preference of the user.



GENERAL CONSIDERATIONS

PREPARATION OF THE PATIENT

Clinical thermography should be carried out in a draught-free, constant temperature environment. A

cool ambient temperature of $19 \pm 1^{\circ}\text{C}$ is the optimum to ensure reliable standardization and operation of the imaging equipment. It is important to strictly follow as many of these factors,

- 1) Expose the area of examination.
- 2) Keeping the subject at rest for 12-15 minutes in constant temperature ($70-75^{\circ}\text{C}$) room.
- 3) Keeping the room free from air currents and heat generating objects¹.
- 4) Subjects being investigated by thermography must have clean, dry skin free from cosmetic cream. Perspiration on the skin reduces the apparent surface temperature.¹³

Thermographic feature suggestive of abnormality is localized area of temperature increase either unilateral or bilateral of about 1.5K or more on over the suspected pathologic area.¹³

Blood vessels which lie within 2 or 3 mm of the surface can be imaged photographically using reflected light and infrared sensitive film. Fat in contrast to muscle is a poor conductor, on the thermogram skin over the fat appears colder than skin over muscle. Hair is avascular and appears as "cold spots". Conversely skin over muscle large veins, bruises, hematomas, infections and injuries appear as "hot spots". Heavy scar tissue and uninfected cysts appear cold as a result of low metabolism and relative avascularity.¹⁵

Since its first application Infrared thermography has shown considerable potential within a number of dental disciplines including Periodontology, Restorative dentistry, Prosthodontics, Oral surgery and Oral Medicine.

SOME AREAS OF RESEARCH AND APPLICATIONS

- i. Breast cancers (by Lawson, 1956)^{11,15}
- ii. Diagnosis and management of malignant melanoma
- iii. To quantitate the inflammation present in Osteoarthritic joint and in sacroiliac region
- iv. To determine the vitality of teeth and Atypical odontalgia
- v. Obstetric application
- vi. For screening for cancer, management of burn or wound healing¹⁶
- vii. To study rheumatic and other orthopedic diseases, cerebrovascular diseases, and ophthalmic disease⁵
- viii. To evaluate dermatologic diseases⁵
- ix. For the quantification of the effects of post-surgical inflammation, dental analgesics, and anti-inflammatory drugs, etc.

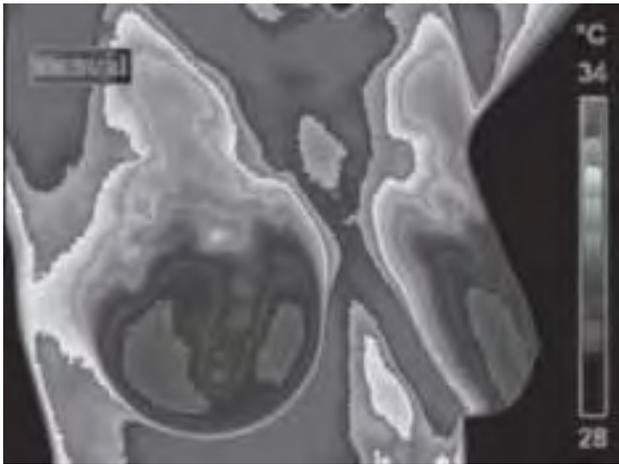
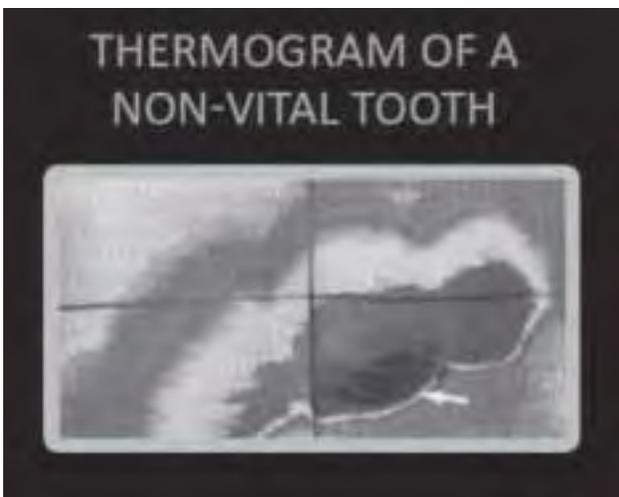
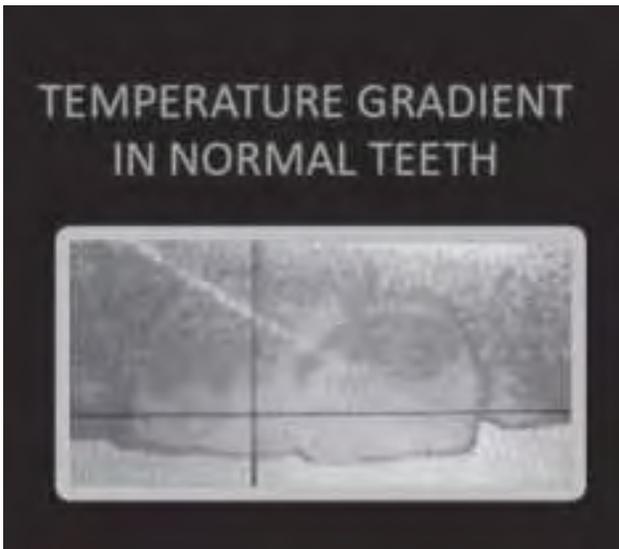


Fig. 8: Thermographic image of breasts



- x. In alveolar bone during implant site bone surgery.
- xi. Useful in the diagnosis of myofascial symptoms associated with temporomandibular disorders etc.

USES

Thermography is being used to investigate a variety of clinical problems. The most important amongst these are:

- 1) Screening for occult malignant disease.
- 2) Delineation of the extent of known disease.
- 3) Identification of areas with abnormal temperatures, which might be the cause of functional impairment of underlying organs or glands.
- 4) Monitoring the effects of various forms of therapy such as reconstructive surgery, radiotherapy or treatment with hormones or drugs.
- 5) Assessing the prognosis of certain disease.
- 6) Identify functional deficiencies and vascular disorders.
- 7) Studying the effects of acute or chronic trauma.
- 8) Physiological research such as energy metabolism and peripheral vascular investigations.¹³

FACIAL TELETHERMOGRAPHY

The normal facial telethermograph

Heat emissions from the human face have been shown to be physiologic indicators of underlying health or disease. Heat emission is directly related to cutaneous vascular activity, yielding enhanced heat output on vasodilatation and reduced heat output on vasoconstriction. Infrared telethermography of the face may serve, therefore, as an utterly harmless non-invasive diagnostic technique that can help to differentiate selected clinical problems.⁶

Overall thermal symmetry usually is present in the face and neck regions of normal subjects. Areas of highest thermal symmetry include the nasal, infra-mandibular, inferior labial, inferior buccal, superior buccal, superior buccal and TMJ regions of the face and neck. The posterior neck and temporal region of the face demonstrated the lowest degree of thermal symmetry. Electronic thermography has potential for use as an alternative diagnostic technique in dentistry.⁷

THE ABNORMAL FACIAL TELETHERMOGRAPH

There has also been interest in the application of thermographic methods to the study of oral and para-oral lesions.

i) Chronic orofacial pain patients

Recent clinical studies have successfully assessed the application of telethermography on patients with chronic oral and or facial pain of greater than 4 month's duration.

ii) Assessing TMJ disorders

The most widely studied application of thermography to the orofacial region has been in the characterization of craniomandibular disorders, particularly TMJ dysfunction.⁴

TMJ pain patients were found to have asymmetrical thermal patterns, with increased temperatures over the affected TMJ region of their face. Specifically, painful TMJ patients with internal derangements and painful TMJ osteoarthritis were both found to have asymmetrical thermal patterns and increased area temperatures over the affected TMJ region of their faces.

The recent dental literature on majority of telethermography studies demonstrated a strong correlation between pain and local hyper perfusion or hyperthermia.⁶

ii) In oral inflammatory conditions

There are few dental studies. In one thermography was used to help determine the vitality of teeth. Results showed that firstly there was no correlation between electric pulp test readings & infrared temperature and secondly decayed / filled tooth surfaces & infrared temperature. One positive result was with a clinical abscess case¹⁵.

Thermography when used in odontogenic inflammatory conditions, the results showed the technique to be effective in active cases of disorders like periodontitis, periostitis, osteomyelitis, abscess and cellulitis¹⁵.

Thermography found that the normal surface temperature of the mucosa was significantly cooler than the temperatures of the inflamed areas in subjects with lesions induced by chemotherapy. Infrared thermography may allow measurement of tooth vitality to be based on blood supply rather than nerve supply. Thus it could be reliable method of vitality

testing after transplantation. There was temperature gradient from the gingival margin to the incisal edge of approximately 2.5°C. The gingival margin of the teeth is at approximately 29°C whereas incisal edge is at approximately 27.5°C at an ambient room temperature of 21°C.

Thermography is a promising aid in the diagnosis of atypical odontalgia⁸ and internal derangement of TMJ.

Other physical disorders that have been reported to produce abnormal facial thermograms and that are potentially related to craniomandibular problems with myofascial pain syndromes, myositis, musculo-ligamentous injury, motor and sensory radioculopathy, herniated disc disease and the inflammation of arthritis and bursitis.⁸

RECENT DEVELOPMENTS AND FUTURE PROSPECTS

- i) Pyroelectric vidicon camera
- ii) Microwave Thermography
- iii) **Dynamic Area Telethermometry (DAT)**
- iv) Digital Infrared Thermal Imaging (DITI)

CONCLUSION

The application of temperature measurement and thermal imaging to assess health and disease (medical thermology) has continued to advance since antiquity up to the present day. The use of thermography has been minimal principally due to technological inadequacies of previous thermal imaging system. However with the ever-developing advancement in technology, current systems are capable of producing real time highly sensitive digitized thermal images. This development has led to take an increased use of newer thermographic imaging both medical and dental research.

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Perceptions of Church Leaders on HIV and AIDS in Metro Manila, the Philippines

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ABSTRACT.

Human Immune Deficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) are serious public health problems. HIV/AIDS cases are on the rise world wide. In the Philippines, experts view the epidemic to be "growing but hidden". Studies show religious institutions including the church can play vital role in HIV prevention, care and support for the people living with HIV and AIDS (PLWHA). This study is an attempt to explore the perceptions, attitude, and knowledge of church leaders towards HIV and AIDS in Metro Manila. Data collected from 24 church leaders in 4 major Christian denominations through face-to-face interviews reveal that a majority of them have poor understanding of HIV/AIDS and related problems. Most of the leaders were reluctant to promote the use of condom. According to them sexual abstinence is the best way of HIV prevention. However, the leaders opine, if a need is felt, all possible measures would be taken to prevent the growth of this deadly virus in the Filipino society. Thus, it is imperative to sensitize the church leaders about the menace of HIV and AIDS situation and the related consequences in the country.

Keywords: AIDS, Church, Church leaders, HIV, Philippines, PLWHA, Metro Manila.

INTRODUCTION

Globally, it is estimated that about 33 million people are living with HIV/AIDS in 2007¹. In the Philippines, about 8300 people are estimated to be living with HIV/AIDS by the end of 2007². The first case of HIV/AIDS in the country was detected in 1984, since then the number of Filipinos infected with the virus has been on the rise³. Health experts describe the potential epidemic to be "growing but hidden"⁴. This growing number of HIV/AIDS cases may be due to apparent lack of public awareness of the virus. As the country is primarily inhabited by Catholics, religion holds a powerful key in shaping the ethical and moral norms of its populace. It is also a well known fact that, visit to spiritual places and adhering to religious practices and beliefs provides hope and gratification to individuals suffering from chronic

ailments including AIDS. Studies have noted that religion practices increase treatment adherence for individuals suffering from chronic ailments including AIDS⁵⁻⁷. This research is significant in exploring the current perceptions of church leaders and their strategic roles to fight against the virus and attached stigma. Three key aspects were explored in this study viz., initiatives taken by four major Christian groupings towards HIV and AIDS, opinions and beliefs of these church leaders towards HIV prevention, care and support activities and, factors acting as constraints to fight against the spread of the virus.

METHODS

Data was collected for a period of seven weeks during a field visit to Metro Manila. Leaders from four major Christian denominations were interviewed throughout Metro Manila including, Manila City, Pasay City, Paranaque, Valenzuela City and Quezon City. The study was exploratory in nature and included 20 sites and interviewed 24 church leaders. Only urban churches were selected on the basis of purposive sampling due to ease in accessibility. The sample however includes both male and female respondents in order to avoid any gender biasness.

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Study Design

A non-experimental qualitative design was adopted in this cross sectional study. The study was analytical in nature as it tried to investigate whether the church leaders perceived HIV and AIDS to be a problem in comparison to other health or developmental problems in the Philippines.

Data Collection Procedures and Analyses

A semi-structured open-ended questionnaire was developed for the study. It contained 21 questions in five different sections. The questionnaire was pre-tested on some of the local church leaders for validation and necessary modifications were made. Prior to each interview session appropriate appointments were taken and a written consent was signed to fulfill the criteria for ethical consideration. De-identified data were collected and each respondent was given a specific identity number to protect privacy. A summary of observations was compiled simultaneously post each interview session. Thematic analyses have been used and each theme was theorised and explained using illustrated quotations from the data set.

RESULTS

The respondent mainly comes under the age group of 25 – 65 years, with median age of 48 year. Six of the respondents were female (25%) and 18 were male (75%). Majority of them have acquired postgraduate qualifications.

Table 1. Churches included in the study

Denomination	Location	Total
Catholic	Urban	13
Evangelical	Urban	06
Protestant	Urban	03
Baptist	Urban	02
	TOTAL	24

Respondents level of understanding of HIV and AIDS

Only few leaders possess the clarity to differentiate between HIV and AIDS. Two respondents felt that their churches had taken initiatives to make their members aware of the virus and its related consequences. 3 of the respondents revealed that, activities undertaken by a local Non-Government Organisation towards HIV prevention helped them to gain appropriate knowledge on the subject. Few of the leaders also perceived that knowing about HIV and AIDS is a matter of self interest.

Perceived impact of HIV and AIDS among Filipinos

Majority of the leaders responded that HIV and AIDS might hamper the country’s tourism industry. One of the respondents also perceived that employment generation opportunities for overseas Filipinos workers would be affected. Almost 11 leaders believed that the disease is spreading more among younger people, children and productive age population and would strongly affect the socio-economic conditions at individual, families and at macro level. Interestingly, one respondent stated that the virus is confined only to a certain population of the society like sex workers, gay community and drug users. Statements like ‘Health is Wealth’; Opportunity and Monetary loss due to ill health, and social issues related to stigma, fear and discrimination were few of the responses received during the interview.

Prioritising HIV and AIDS as health issues

Surprisingly, many respondents believed that besides HIV and AIDS, there are currently other health concerns like tuberculosis, cancer, heart diseases, diabetes, dengue, and under-nutrition among children which need to be prioritized. Apart from these health problems, few developmental issues were also pointed out like poverty, increasing crime, corruption etc. Very few perceived the disease to be growing inside and in latent state that needs timely attention. Two of the interviewees strongly felt that the disease was a head on problem and required holistic approach.

Perceptions on condom use and promotion

Majority of the leaders were reluctant to promote the use of condom. Two of the Catholic leaders perceived that it is an individual choice to use a condom or not. One of the leaders also supported its use in specific medical conditions especially, if one of the partners is HIV infected. According to another leader, use of condom is secondary and people should be faithful and follow abstinence. Similarly, for unmarried, promotion of condom use is inconsistent as per the Church teachings.

Perceptions on promoting sexual abstinence

Church leaders from all the four denominations candidly expressed the idea of promoting sexual abstinence. According to Bible preaching, sex should only happen after marriage. Some of the leaders’ perceived abstinence is the best and most effective way to avoid HIV virus. They also perceived when someone is faithful to a partner than he/she would be 100% safe from acquiring the HIV infection. One of the

leaders also compared abstinence to be a better option than condom use.

Perceived strengths within churches to fight against HIV and AIDS

A plethora of strengths are perceived by the church leaders which could make a difference in disease prevention and providing care and support to the sufferings.

Perceived factors that are driving the spread of HIV infection

The most commonly cited risk factor for HIV transmission was promiscuity followed by ignorance and poverty.

Activities undertaken by Churches to address HIV and AIDS

A very handful number of church was found to be directly involved in addressing the problem of HIV and AIDS either by conducting prevention activity or by providing care and support to the sufferings. A comprehensive intervention program was not in the priority list of any church, because HIV problem is not

willing to partner with developmental agencies to address challenge areas and fight the HIV epidemic. Bilateral programs in specific to HIV and AIDS and other health issues like TB, dengue were conducted only by three churches. Few churches have been working in partnership with funding agencies for socio-economic and developmental related issues. Some of the leaders believe that collaboration and partnership can address financial, technical and human resource crunch.

Perceived acceptable prevention message

Different types of prevention message that churches were willing to deliver mostly emphasis on abstinence and fidelity based on Bible teachings. One respondent said, they teach singles and couples differently to prolong life by keeping away from immorality. Nevertheless, a few respondents indicated that they do teach all the messages of prevention wherever necessary.

Attitude towards HIV prevention

The overall attitude of church leaders was found to be congenial and positive towards HIV prevention. However, majority of churches were also not

Table 2. Perceived strengths within churches

Perceived strengths for disease prevention	Perceived strengths for providing care and support system for sufferings
Ability to advocate and disseminate information effectively.	Spiritual and emotional support by sharing the message of hope, compassion, grace and love.
Ability to building and creating networks for Transformational and community development.	Power of counseling to eliminate stigma and discriminations.
Possession of virtues like credibility, fidelity, accountability, acceptability, and relationship with god.	Ability to nurture through holistic development i.e. development of physical, psychological, moral spiritual, economical, and social wellbeing.
Power of eliminating ignorance through education.	Pastoral support for PLWHA

Table 3. Perceived factors that are driving the spread of HIV and AIDS

Promiscuity	Intra venous Drug Users
Prostitution	Ignorance
Lack of employment	Extra marital sex
Poverty	Overseas Filipino Workers
Curiosity about sex among teenagers	Thriving sex industry

a felt need as compared to other health problems. However, through sermons, free seminars and congregations, most of the churches disseminate the message of leading a righteous life to people.

Collaboration, networking and partnership

A majority of church leaders interviewed were

Table 4 Activities undertaken by churches to address HIV and AIDS

Gospel preaching for responsible lifestyle.
Programs targeted to teenagers for building healthy relations i.e. relation of brother, sister and the Christ.
Program targeted among married couples to be faithful and avoid extra marital relationship.
Counseling programs targeted to drug users.
Prayer rallies for prostitutes.
Support for income generating activities to alleviate poverty.
Advocacy and information dissemination through free seminars.
General medical and dental camps through healthcare ministries.
Campaign targeted to youths and professionals on abstinence.

convinced with the idea of rising HIV cases and related deaths. Leaders believed that contribution for HIV prevention can be done provided, a need is felt. When asked about willingness of churches to involve in activities relating to HIV prevention, there were both supportive & non-supportive responses. Alternatively, very few churches were already involved in some sort of prevention activity. According to them the prevention lies within advocacy, information dissemination, and message development. One of the respondents also said that clear and accurate messages delivered through churches could make a real difference.

Attitude towards care and support for People Living with HIV and AIDS

Majority of the church leaders regard it as a mission of churches to provide care & support for the sufferings. Resources, expertise, training & appropriate guidance to deal with PLWHA are the areas that require help according to few of the respondents. One of the leaders also replied that church had a major role to play in the recovery part hence; it can provide spiritual and emotional support to people living with HIV and AIDS.

DISCUSSIONS

HIV/AIDS in the Philippines is growing. The youths, adults and children are at risk of contacting the virus. Health experts describe the situation to be a tip of an iceberg with maximum number of cases still going unreported due to social stigma, discrimination and inadequate access to medical facilities⁸. Involvement of churches towards HIV/AIDS prevention was seen in 2006 after the visit of Caritas Internationalis special advisor in the Philippines⁹. However, only few churches are involved with some sort of the prevention activities insisting on abstinence, monogamy and purity in a relationship. This again put them in conflict with HIV experts who believe condom use should be the essential aspect of any prevention program. Leaders prioritise HIV and AIDS to be insignificant against other public health and developmental problems like TB, cancer, and dengue, poverty, corruption, unemployment etc.

An attempt to compare and contrast findings of this study with previous studies revealed a mixture of conformity and deviations. Results of the study confirms previous findings that Churches were willing to provide care and support for the infected and the affected as a part of their Christian obligation. Resources in terms of human expertise and financial support are always a matter of constraints that are even experienced in most of the previous findings¹⁰⁻¹².

This study shows that churches are willing and keen to participate in prevention activities as well and deliver a message of being faithful, maintaining purity in a relationship and follow abstinence. For teenagers and adolescents they converse more about building relationship and follow an affiliation of brotherhood-sister and the Christ. Study findings also confirm previous findings that churches are opposed to promoting condom use^{13,14}. Pre- and extra-marital sex is a practice that is clearly condemned in the Bible. Allegiance to the Bible is probably what distinguishes church-based programs from those that are implemented by secular organizations.

The result reveals and contradicts major studies in the past that churches focus only on recovery part. However findings clearly states, church leaders are equally keen to mobilise their resources for prevention activities such as educating people, creating awareness and health promotion.

Contrary again to previous studies, this study shows that churches still possess the attitude to support PLWHA. They strongly believe components like hope, compassion, care and grace offered by the churches and other religious institutions can eliminate stigma and discrimination linked with the disease.

CONCLUSIONS

HIV/AIDS in Metro Manila is 'growing but hidden'. The situation at the moment is similar to the situation experienced by most of the African countries twenty years ago. The Church leaders in Metro Manila also anticipate the situation like 'a tip of an iceberg'. They hardly perceive HIV and AIDS to be a head on problem in the country, but their willingness and attitude to address the health concern is very positive and congenial. Therefore, urgent and concerted efforts are needed to sensitize the church leaders by making them realise, the real HIV situation in the country and convince them to foresee the problem as a potential and possible pandemic bearer in near future.

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An Interventional Study on Knowledge, Attitude and Practice Regarding Oral Rehydration Therapy Among Mothers of Under Five Children in an Urban Slum of Rajahmundry, AP

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ABSTRACT

Background: Diarrhea & dehydration is the major cause of death among the children under five years and accounts for more than 6 lakh deaths. The slum children are more vulnerable. The mothers should be educated to practice regarding ORT and care during diarrheal episodes.

Objectives: 1. To study the knowledge, attitude and practice regarding ORT among the mothers and educate them about ORT. 2. To evaluate after imparting health education.

Materials And Methods: Around 600 mothers of under five children were interviewed with the help of a pretested questionnaire. The mothers were given health education regarding Oral Rehydration Therapy (ORT) and care during diarrhea & followed up after three months to assess their knowledge & practice.

Results: Only 21% of the study subjects were aware of ORT which significantly increased after health education ($p=0.0000$). The awareness was more among the higher educated ($p<0.001$). Significant number of respondents could name at least two danger signs of dehydration, home available fluids, preparation of sugar and salt solution ($p<0.001$). At the end of study, significant number of the mothers could correctly demonstrate how to prepare Oral Rehydration Solution (ORS) ($p<0.001$).

Conclusions: Most of the respondents were not aware regarding ORT and care during diarrhea which significantly increased in the follow up visit after health education. Hence IEC activities, and awareness campaigns to be intensified and organized in the slum area.

Key words: Diarrhea, Dehydration, ORT, Home available fluids, Demonstration.

INTRODUCTION

Acute diarrheal diseases constitute a major public health problem especially in the developing countries where children under 5 years are worst sufferers¹.

About 3 million deaths globally are associated with diarrhea and India alone accounts for one-third of these

deaths². During 2005, about 1.07 million cases were reported in India with 2040 deaths³. Around 65% of deaths are due to dehydration. In India, children suffer from as high as 6-12 episodes of diarrhea per year⁴. The slum dwellers are most affected because of their poor prevailing conditions, poverty, lack of knowledge, personal hygiene & incorrect feeding practices. It causes a lot of economic burden on health services, so emphasis has been given to it and its management which is dominated by advances in oral rehydration techniques⁵. According to recent reports, Oral Rehydration Therapy (ORT) may now be preventing about 3 million deaths, globally in a year,⁶ thereby reducing the disease burden⁷. About 90% of all diarrheal episodes can be managed at home by mothers with appropriate ORT. They should be able

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to recognize dehydration and start ORT, seeking medical advice whenever necessary⁸.

Hence mothers, particularly of under-five children need to be educated about ORT, basic sanitation and care during diarrhea to reduce its incidence. This study is an effort to educate them in order to reduce the disease burden.

MATERIALS AND METHODS

Study design: Community based interventional study

Study area: slum covered by UHC, Ambedkarnagar which is the field practice area of GSL Medical College, Rajahmundry, A.P.

Study subjects: mothers of under-5 children.

Sample size: 600

Study period: March to September 2010

Sampling technique: systematic random sampling technique

Study variables: Age, occupation, education, awareness regarding ORS, home available fluids, danger signs etc.

Study instrument: pre-tested questionnaire, health education material.

Statistical analysis: percentages and proportions, chi-square.

METHODOLOGY

The study was conducted in a slum area covered by Urban Health Center (UHC), Ambedkarnagar which is the field practice area of GSL Medical College. It caters to a slum population of 16,967 and 5,988 households. 10% of the households were selected for study which was calculated upto 600. Every 10th house was selected for interview. All the mothers of under 5 children were interviewed with the help of a pre-tested questionnaire after obtaining their verbal consent. If there was no under 5 child in the 10th house, the next house was selected for interview. The mothers were given health education regarding Oral Rehydration Solution (ORS), its preparation, home available fluids, care during diarrhea with the help of charts and correct demonstration of preparation of ORS by the help of interns who were trained regarding this. The study subjects were interviewed again with the same questionnaire after a period of 3 months. Around 550 study subjects were interviewed in the follow up study. 50 houses were locked in spite of several visits. Data collected was analyzed in office excel 2007.

RESULTS

Out of 600, 315 (52.5%) mothers belonged to 19-24 age group followed by 25-30 age group (40.17%). Majority of them, 509 (84.83%) were Hindus followed

by Christians (11.17%). Nearly half of them, 297(49.5%) are educated upto primary or are illiterate. Around 287 (47.83%) work for daily wages and 217 (36.17%) are house wives. Majority of them belong to lower class (59.33%) according to Modified Kuppaswamy scale.

Table 1 shows that only 127 (21.17%) out of 600 mothers were aware of ORT. The source of information about ORS is mainly through media (53.54%), followed by friends and relatives (23.62%) as shown in Table 2. After imparting health education, 528 mothers (96%) became aware of it in the follow up study which is statistically significant (P=0.0000). It was also seen that awareness was more in the educated mothers (P=0.0000) which is shown in Table 3.

Table 1. Awareness regarding Oral Rehydration Therapy

Awareness	Pre-intervention		Post-intervention	
	No	%	No	%
Yes	127	21.17	528	96.00
No	473	78.83	22	4.00
Total	600	100.00	550	100.00

P= 0.0000

Table 2. Source of information regarding ORS

Source of information	Number	Percentage
Media	68	53.54
Health staff	22	17.32
Friends & relatives	30	23.62
Others	7	5.50
Total	127	100.00

Table 3. Literacy status of respondents and awareness about ORT

Literacy status	Pre-intervention		Post-intervention	
	No	%	No	%
Prof/Hons	-	-	-	-
Grad/PG	21	16.54	21	3.98
Inter/ITI	46	36.22	48	9.09
High school certificate	28	22.05	142	26.89
Middle school certificate	15	11.81	86	16.29
Primary	11	8.66	151	28.60
Illiterate	6	4.72	80	15.15
Total	127	100.00	528	100.00

P=0.0000

Out of the 127 mothers who were aware of ORT, only 33 (26%) used ORS. However in the follow up study, 290 (55%) were using it.

There were 680 under 5 children in all the 600 households, out of which

172 children(25.29%) suffered from diarrhea in the last 2 weeks and 260 children (38.23%) suffer frequently. Around 313 (52.17%) mothers out of 600, sought medical advice during diarrheal episodes, out of which 173 (28.83%) preferred Government Hospitals and 427(71.17%) sought advice from Private hospitals.

Out of 600 mothers, 268(44.66%) had knowledge regarding various home available fluids and majority of them (55%) used them during diarrheal episodes. Around 294(49%) mothers were aware to continue breast feeding & practised it. After intervention, 474 (93.5%) were aware as well as practicing it which is statistically significant ($P=0.000$).

Out of 127 mothers, who had knowledge regarding ORS, had correct knowledge how to prepare sugar & salt solution and 6 (15%) among them used regularly during diarrheal episodes. In the follow up study, 298 mothers (56.44%) out of 528 had correct knowledge regarding its preparation which is again statistically significant ($P < 0.001$).

Only 29 out of 600 mothers (4.83%) could tell that immunization protects against diarrhea whereas 571 (95.17%) did not have any idea about it. In the post interventional study, 323(58.73%) out of 550 could tell about the importance of immunization for prevention of diarrhea ($p < 0.001$).

In the pre-interventional study, out of 127 mothers who were aware of ORT, only 9(7.09%) knew about the correct quantity of ORS to be given to the child during diarrheal episode which significantly increased to 359 (68%) out of 528 after intervention ($p < 0.001$).

Out of 600, 200 mothers (33.33%) did not know where to procure ORS packets but in the follow up study, 266 mothers out of 550 could tell about its availability in the UHC, whereas 21.82% knew about its availability in the medical shop only. 10% still were unaware regarding the availability of ORS packets.

Out of 600 mothers, 108 (18%) could tell about minimum 2 danger signs of dehydration as per guidelines for assessment of dehydration⁹ whereas in the follow up study 240(40%) could name at least 2 danger signs.

Out of 127 mothers who were aware of ORT, only 20 (15.8%) could demonstrate the correct way to prepare ORS but in the follow up study, 396 out of 528 (75%) could correctly demonstrate its preparation which is statistically significant ($p=0.0000$). Table 5 shows that the higher educated mothers could demonstrate better & in a correct way ($P=0.0000$).

DISCUSSION

It is seen that only 21.17% of the mothers were aware regarding ORT which is very important in a slum area where 38.25% of the children suffer frequently from diarrhea. After imparting health education 96% of the mothers were aware. The figures are similar to the studies conducted by Zagade in Pune¹⁰ and S.Panda in Cuttack¹¹. Maternal literacy

Table 4. Literacy status and correct demonstration of preparation of ORS

Literacy status	Pre- intervention		Post-intervention	
	No	%	No	%
Prof/Hons	-	-	-	-
Grad/PG	10	16.54	21	5.30
Inter/ITI	6	36.22	48	11.62
High school certificate	3	22.05	140	35.35
Middle school certificate	1	11.81	82	20.71
Primary	-	-	89	22.47
Illiterate	-	-	18	4.55
Total	127	100.00	528	100.00

$P=0.0000$

status positively affected the mothers understanding of ORT and her ability to prepare ORS which is similar to the study by Gopal Das¹². The source of information regarding ORS before health education was mainly through media (53.5%) which is similar to the study conducted in Urban slum community of Tigris¹³ and a study by Dua et al¹⁴. The health staff of UHC should educate the mothers more frequently regarding the benefits of life saving ORS and care during diarrheal episodes as they have more scope to educate them about it and clearing their doubts as it is a two way communication process. Though 96% were aware of ORS in the follow up study, only 55% were using it which is similar to the study by Bhatia in Chandigarh¹⁵ and NFHS-3 data¹⁶ where usage was poor though maximum mothers knew. Only 52.17% sought medical advice during diarrheal episodes, out of which 71.17% preferred private hospitals instead of the UHC which can equally provide good care. The mothers need to be convinced about the quality care provided in the UHC or any Govt. hospital.

It is also seen that 44.66% of the mothers had knowledge regarding Home Available Fluids and majority of them used it which is again similar to the study conducted in Tigris. The awareness and practice to continue breast feeding during diarrheal episodes was seen among 49% before intervention which is similar to study conducted by Gupta et al.¹⁷ The knowledge and practice increased to 93.5% in the follow up visit which is a good sign as it should be continued among the infants. Exclusive breast feeding during 4 to 6 months have been shown to dramatically reduce the incidence of diarrhea¹⁸.

In the absence of ORS packets, the mothers should be able to prepare sugar and salt solution to prevent dehydration. Though initial knowledge was poor but 56.44% gained knowledge regarding its preparation in the follow up study.

The mothers should also be able to recognize dehydration and seek medical help when condition of child worsens. Only 40% could name 2 danger signs of dehydration even after health education. Hence they

should be repeatedly visited by health staff and educated.

It is also important for them to know about protection from diarrhea provided by immunization. Though the initial knowledge was very poor, it increased after intervention.

It is also important for them to know the correct quantities of ORS to be fed to the child as prescribed¹⁹ which was 68% in the follow up study as compared to the initial visit (7.09%).

Recently WHO has recommended a hypo-osmolar ORS for treatment of all cases of acute diarrhea,²⁰ which is available in all PHCs, sub centers, UHCs etc. Though the UHC is well provided with the ORS packets, 33.33% of the mothers did not know where to procure them. Even after health education & information, only 21.82% could tell about its availability in UHC. Hence the health staff need to educate the mothers about its availability and other health facilities and health programs so that they can utilize the facilities available to them. With health education, their health knowledge, attitude and practice will improve as it was in a study by Akram DS in Karachi²¹.

CONCLUSION AND RECOMMENDATIONS

Most of the respondents in the slum area were not aware regarding ORT and proper care during diarrhea which significantly increased in the follow up visit after imparting health education. Hence health education, IEC activities may be intensified and awareness campaigns to be organized on Reproductive and Child Health in which ORT in the child component is important.

Adequate health care facilities with quality care and outreach services should be provided in the hospitals particularly the UHCs and PHCs.

Repetition of these campaigns periodically and involvement of volunteers, Youth clubs, NGOs to carry out the same. The awareness among slum dwellers to be risen to such high level that their health needs should become the felt needs of the community and in turn the health demands of slum dwellers.

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Adolescent Girls and Reproductive Health: An Interventional Study in a Slum of Vijayawada, AP

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ABSTRACT

Background: Adolescent period is characterized by physical, mental and emotional changes to prepare for adult role in almost all aspects of life including marriage, motherhood and earning. Lack of knowledge, skills, access to contraception and vulnerability to sexual abuse, particularly among the slum dwellers, put the adolescents at high risk of unwanted pregnancy, early child birth, unsafe abortion and RTI including HIV/AIDS. Hence to avoid these problems, they should be aware regarding all aspects of reproductive health

Objectives: 1. To study the knowledge, attitude and practice regarding reproductive health among the adolescent girls and educate them about reproductive health. 2. To evaluate after imparting health education.

Materials and Methods: Around 450 adolescent girls were interviewed with the help of a pretested questionnaire. The mothers were given health education regarding various aspects of reproductive health including HIV/AIDS & followed up after three months to assess their knowledge & practice.

Results: Only 48.89% of the study subjects were aware of Reproductive Health which significantly increased after health education ($p=0.000$). The awareness was more among the girls whose mothers were more educated ($p=0.000$). Significant number of girls were practicing menstrual hygiene and were aware of contraceptives including emergency contraceptives, minimum legal age of marriage, sexually transmitted diseases, HIV/AIDS including modes of transmission and prevention after giving health education ($p=0.000$).

Conclusions: Most of the adolescent girls were not aware regarding Reproductive health which significantly increased in the follow up visit after health education. Hence IEC activities, and awareness campaigns regarding reproductive health including HIV/AIDS to be intensified and organized in the slum area.

Key words: Adolescent girls, Reproductive health, Awareness, Contraceptives, Menstrual hygiene.

INTRODUCTION

Adolescence has been defined by the World Health Organization as the period of life spanning the ages between 10 to 19 years¹. This period is characterized by physical, mental and emotional changes to prepare for adult role in almost all aspects of life including marriage, motherhood and earning. Sexual and reproduction is the main functional development

during this period. In India adolescents constitute nearly a fifth of total population. Around 49% in rural and 29% in Urban areas are married by the age of 18 years². which results in a host of detrimental reproductive outcomes. It is well known that in growing children, conception leads to the cessation of growth in the mother, also an increased risk of adverse obstetric and neonatal outcomes³. Lack of knowledge, skills, poverty, access to contraception and vulnerability to sexual abuse, particularly among the slum dwellers, put the adolescents at high risk of unwanted pregnancy, early child birth, unsafe abortion and RTI including HIV/AIDS.

It is therefore necessary to create awareness regarding all aspects of reproductive health like reproductive hygiene, contraception, consequences of

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unprotected sex, Sexually Transmitted Diseases (STD), Reproductive Tract Infections (RTI) including HIV/AIDS etc., so that they are not only prepared physically but also psychologically for smooth transition from childhood to adulthood, as they are going to contribute to the future of our country.

This study is an attempt to study their knowledge, attitude and practice regarding reproductive health and educate them about it to create better reproductive health outcomes.

MATERIALS AND METHODS

Study design: Community based interventional study
Study area: slum covered by UHC, Rajarajeswaripeta, Vijayawada

Study subjects: 450 adolescent girls.

Study period: July to December 2008

Sampling technique: Systematic random sampling technique

Study variables: Age, education of subjects and mother, awareness regarding reproductive health, menstrual hygiene practices, awareness regarding contraceptives, minimum legal age of marriage, HIV/AIDS etc.

Study instrument: pre-tested questionnaire, health education material.

Statistical analysis: percentages and proportions, chi-square.

METHODOLOGY

The Vijayawada Municipal Corporation consists of approximately 132 notified slums which are attached to 22 Urban Health Centers (UHC). Out of these, UHC, Rajarajeswaripeta, was selected by Simple random sampling technique using lottery method. This UHC comprises of 5 slums, catering to a total population of 33,903 and 6,626, households. All slums were included in the study for effective coverage. 10% of the households were selected for study which was calculated upto 663. Every 10th house was selected for interview. The number of households from each slum taken for study was taken according to the proportion of its contribution to the entire slum population under UHC. Thus 450 adolescent girls were identified in these households. All the adolescent girls were interviewed with the help of a pre-tested questionnaire after obtaining their or their parent's verbal consent. If there was no adolescent girl in the 10th house, the next house was selected for interview. The adolescent girls were given health education regarding all aspects of reproductive health like reproductive hygiene, contraception, emergency contraceptives, minimum legal age of marriage, consequences of unprotected STD/RTI including HIV/AIDS etc. with the help of lectures and charts. The study subjects were

interviewed again with the same questionnaire after a period of 3 months. Around 425 study subjects were interviewed in the follow up study. The doors of the 25 houses were locked inspite of several visits. Data collected was analyzed in office excel 2003.

RESULTS

Out of 450, 190 (42.22%) adolescent girls belonged to 16-19 age group followed by 13 - 16 age group (39.56%). Majority of them, 266 (59.11%) were Hindus followed by Christians 98(21.78%). Most of them, 172 (38.22%) belonged to backward caste. Around 46 (10.22%) girls were illiterate, 168 out of 450 adolescents (37.33%) were educated upto primary and discontinued their studies. Most of them, 258 (57.33%) belong to nuclear family. Majority of them belong to upper lower class, 263 (58.44%) according to Modified Kuppuswamy scale.

Out of 450 adolescent girls, 170 (37.78%) were already married & out of them, 145(85.29%) had already delivered a child.

Table 1 shows that 220 (48.89%) out of 450 adolescent girls were aware regarding reproductive health but after imparting health education, 312 (73.41%) out of 425 adolescent girls were aware of it in the follow up study which is statistically significant (P=0.000). The source of information about it in the initial study was mainly through mass media, 78 (35.45%), followed by friends and relatives 96(43.64%). It was also seen that the literacy status of the mother influenced the reproductive health awareness among the adolescents. The more was the education of the mother, the more was the awareness, (P=0.000) which is shown in Table 2.

Table 1. Awareness regarding Reproductive Health

Awareness	Pre- intervention		Post-intervention	
	No	%	No	%
Yes	220	48.89	312	73.41
No	230	51.11	113	26.59
Total	450	100.00	425	100.00

P= 0.000

Table 2. Literacy status of mothers and awareness about Reproductive health

Literacy status	Literacy of mother of adolescents		Reproductive Awareness among adolescents	
	No	%	No	%
High school certificate & above	78	17.33	68	30.91
Middle school certificate	142	31.56	98	44.55
Primary	150	33.33	36	16.36
Illiterate	80	17.78	18	8.18
Total	450	100.00	220	100.00

P=0.000

The awareness regarding legal minimum age of marriage was 230 out of 450 (51.11%) before imparting health education which increased to 310 out of 425 (72.94%). This is statistically significant (P=0.000). Around 34 adolescents out of 170(20%) had married below the age of 18 years.

About 400 out of 450 girls (88.89%) had experienced menarche, out of which 200 girls (50%) had experienced at the age of 12 years followed by 130 (32.5%) at the age of 13 years. Practice of menstrual hygiene was seen among 150 girls out of 400 (37.5%) before imparting health education whereas in the follow up study, it was practiced by 262 (65.5%) which is highly significant.(P=0.000). (Table 3).

Table 3. Practice of menstrual hygiene

Practice	Pre- intervention		Post-intervention	
	No	%	No	%
Yes	150	37.50	262	65.50
No	250	62.50	138	34.50
Total	400	100.00	400	100.00

P= 0.000

The practice of menstrual hygiene was assessed in terms of regular bath, use of sanitary towels or napkins, regular change of pads, washing of external genitalia etc. Out of 400 girls, 306 (76.5%) had problems during menstruation, out of which maximum number of girls suffered from dysmenorrhoea, 155 (50.65%) followed by excessive bleeding during menstruation(25.49%). Only 61(19.93%) sought medical advice for their problems.

Table 4 shows awareness regarding contraceptive methods which was only 90 (20%) out of 450 before imparting health education which significantly increased to 212 (49.88%) in the follow up study (P=0.000). Among those who were aware of contraceptive methods, only 4 out of 90 (4.44%) could tell about emergency contraceptives whereas in the post- interventional study, 100(47.16%) were aware of it . Attitude towards 1 child norm was seen among 54 girls out of 450 (12%) and 2 children norm among 315 (70%) girls. After intervention also, 22 out of 425 (5.18%) were still unsure.

Table 4. Awareness regarding Contraceptive methods

Awareness	Pre- intervention		Post-intervention	
	No	%	No	%
Yes	90	20.00	212	49.88
No	360	80.00	213	50.12
Total	450	100.00	425	100.00

P= 0.0000

About 180 girls out of 450 (40%) still believed that the decision regarding adoption of family planning methods should be taken by elders. Only 30 out of 450

(6.67%) girls felt that both the husband and wife should decide. However after intervention, 60 girls out of 425(14.12%) felt that the married couple should take the decision and 8.24% girls wanted to be dependent on their own decision.

Table 5 shows the significant change in the awareness regarding HIV/AIDS among the girls after intervention. (P=0.000). Among the 297 girls, who were aware of it in the initial study, the source of information was mostly through mass media, particularly TV. (72%). Awareness regarding modes of transmission of HIV/AIDS was adequate among 116 out of 297 (39%) in the initial study and 263(67.96%) out of 387 girls who became aware of it in the post interventional study. This is highly significant. (P=0.0000). Adequate knowledge regarding transmission of HIV means all the four modes essential modes of transmission (sexual contact, through needles and blades, through blood and blood products and mother to child). The awareness regarding protection from HIV was present among 172 out of 297 girls and 302 out of 387 girls who were aware of HIV, in the pre and post interventional study respectively. (P=0.0000). Out of these 172 girls, only 37(21.51%) had correct knowledge regarding protective measures from HIV/AIDS which significantly increased to 151 out of 302 girls (50%). (P=0.000). Knowledge about safe sexual practices, safe injection practices, blood testing prior to blood transfusion, screening during antenatal period etc was regarded as correct knowledge.

Table 5. Awareness regarding HIV/AIDS

Awareness	Pre- intervention		Post-intervention	
	No	%	No	%
Yes	297	66.00	387	91.06
No	153	34.00	38	8.94
Total	450	100.00	425	100.00

P= 0.0000

Out of 450 girls, 90 (20%) were aware regarding STDs and 8 among them (8.89%) had knowledge regarding association between STD and HIV in the pre-intervention study whereas 289 out of 425 (68%) were aware about it and 61 out of them (21.19%) were aware of its association with HIV/AIDS. (P<0.001).

DISCUSSION

It was seen that most of the girls belonged to 16 - 19 age group and 47.55% of the adolescent girls were either illiterate or educated up to primary school out of which 50% were school drop outs which is a negative factor in spite of residing in urban area. Around 72% of the adolescent girls belong to low socio economic status that are vulnerable owing to poverty and

ignorance. About 37.78% of the adolescents were already married being exposed to the risk of reproductive morbidity and mortality related to early conception. The finding is similar to that of NDHS - 2 data (1998-1999)(4). Besides the social problems like decreased morbidity, lower educational attainment, increased risk of domestic violence, married adolescent girls have a greater risk of suffering from adverse reproductive outcomes⁵. It is a discouraging fact that out of these nearly 85% have already delivered a child which is similar to the findings of Ashok Dyalchand⁶.

Around 49% were aware regarding reproductive health in the initial study which increased to nearly 74% which is a welcoming sign. Hence the health staff of UHC must educate them regularly. The literacy status of the mothers positively influenced the awareness of their daughters. Hence emphasis has to be paid also on the education of the adolescent girls who are going to be the future mothers.

The awareness regarding legal minimum age of marriage was 51% in the initial study which is similar to the study conducted by Neeru Gupta et al⁷ where more than half of them were aware. In the follow up study this knowledge significantly increased to 72.94% and attitude towards marrying beyond 18 yrs was more favorable which is quite encouraging.

About 20% of the married adolescent had married below the age of 18 yrs which is similar to the data according to NFHS - 3.

Around half of the girls had experienced menarche at the age of 12 yrs which is similar to the studies by Haldar et al⁸. The mean age of menarche was reported to be 12.5 yrs which is similar to study by Dasgupta et al⁹ where it was reported to be 12.8 yrs.

Practice of menstrual hygiene significantly increased from 37.5% adolescents to 65.5% of them which is a very welcoming sign as women having better knowledge regarding menstrual hygiene and safe practices are less vulnerable to reproductive tract illness and its consequences.

Dysmenorrhoea was the common problem which was experienced by 50.65% during menstruation. This is similar to the findings of Avasarala A K¹⁰ where the prevalence of dysmenorrhoea was 52.5% and the studies by Nair P et al¹¹ and French L¹² which is concurrent. Only 19.93% seek medical advice for the problems with findings of Jeejeebhoy S J¹³. The awareness regarding contraceptive methods was 90 out of 450 (20%) before health education which is similar to the study by Majumdar and Ganguly¹⁴ as well as Gupta Neeru¹⁵ but it significantly increased to 49.88% in the follow up study.

Initially only 4.44% were aware of emergency pills but in the follow up study, 47.16% became aware which is similar to the figures of a study by Kushwas et al¹⁵. As the adolescent girls are the main victims of unwanted teenage pregnancy and its consequences, they should be more aware of all the family planning methods including emergency contraceptive pills.

Attitude towards 1 child norm was seen among 12% and 2 children norm was seen in 70% which is similar to the study by Neeru⁷.

About 40% still believed that the decision regarding adoption of family planning should be taken by elders. However after health education, around 22% were confident of talking their own decision or collective decision of herself and spouse. They need to be educated about family planning methods particularly the married adolescents must be counseled by the health staff.

66% were aware about HIV/AIDS and the source of information mass media is through TV (72%), which is similar to the studies by Hemchandra K (17), P Lal et al¹⁸ and Sodhi S et al¹⁹. Friends also be made instrumental in spreading information through frequent motivation. The awareness regarding HIV/AIDS, modes of transmission, protection or prevention of AIDS significantly increased after giving health education. Hence HIV awareness campaigns for the youth should be conducted in the slum frequently. The awareness regarding STDs and its association with HIV also significantly increased after imparting Health education on which should also be incorporated in the health education programmes.

Finally evidence also points that a combination measures such as comprehensive family life education access to contraceptive care and youth development through institutional and outreach methods reaps favorable methods creating better reproductive health outcomes²⁰.

CONCLUSION AND RECOMMENDATIONS

There is a need for evolving information, education and communication strategies to focus on raising awareness on reproductive health. Health education plays a significant role in enriching the knowledge regarding reproductive health. As the adolescent girls are main victims of unwanted teenage pregnancy and its consequences, reproductive tract infections or HIV/AIDS, they should be more aware regarding all aspects of reproductive health including reproductive hygiene particularly during menstruation, contraception, legal age of marriage, STI/RTI, HIV/AIDS etc. All the sources of knowledge including educational institutes,

health staff should be well known and approachable to them in order to adapt correct attitude and practice for a favorable reproductive outcome there by reducing the morbidity and mortality among them.

Hence health education, IEC activities may be intensified and awareness campaigns to be organized on Reproductive Health and repetition of these campaigns periodically and involvement of volunteers, Youth clubs, NGOs to carry out the same.

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Incidence and Microbial Profile of Chronic Suppurative Otitis Media at Gulbarga, Karnataka

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ABSTRACT

Objective: Chronic suppurative otitis media (CSOM) is a prevailing and notorious infection in developing countries causing serious local damage and threatening complications. Early and effective treatment based on the knowledge of causing micro organisms and their sensitivity results in good clinical recovery and prevents from damage and complications.

The study intended to identify the incidence of bacterial infection in the CSOM and to determine their sensitivity to current antibiotics.

Methods: After clinical evaluation, middle ear secretion was taken for bacteriological examination from 250 patients meeting the inclusion criteria. All children with cholesteatoma and those with tumors occluding the (ear) canal were excluded. The samples were processed as per the standard microbiological techniques.

Results: A total of 272 bacterial agents were isolated from 250 patients aged between 8 months and 65 years. 220 samples yielded pure growth and 22 were mixed, *Pseudomonas aeruginosa* (39.7%) was the commonest isolate followed by *Klebsiella pneumoniae* and *Staphylococcus aureus*. Among anaerobic bacteria, Bacteriodes was the predominate bacteria isolated. Most of the isolates were resistant to commonly used antibiotics. ESBL evaluation revealed that 20.4 % of gram negative bacteria were extended beta lactamase producers. 63.4% of *Pseudomonas aeruginosa*, 20.3% of *Klebsiella pneumoniae* were the predominate organisms resistant to 3 GC.

Conclusion: *Pseudomonas aeruginosa* was the most common bacteria isolated from chronic discharging ears followed by *Klebsiella pneumoniae*. Amikacin was found to be the most suitable drug followed by ceftazidime for *Pseudomonas aeruginosa*. The high rate of multiple drug resistance for frequently used antibiotics raises serious concern.

Key words: Chronic suppurative otitis media, Drug resistance

INTRODUCTION

Chronic Supportive otitis media (CSOM) is a long standing purulent infection of middle ear cleft, presenting as purulent ear discharge which may be associated with variable degree of hearing loss. It

occurs as a complication of acute otitis media, a common condition with an alarming propensity to be chronic infection. The complications of CSOM include mastoiditis, meningitis, focal encephalitis, intracranial abscesses and otitis hydrocephalus^{1,2}.

The microbiology of CSOM is unique as polymicrobial anaerobic floras were isolated from over half of the cases. The aerobic microorganisms most frequently isolated are *Pseudomonas sps*, *Staphylococcus aureus*, *Klebsiella sps*, *E. coli* and *Proteus sps*³.

Chronic otitis media has a multi-factorial etiology with highly variable prevalence through out the world.

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In Industrialized countries the prevalence of this disease showed a marked decline during the post World War II era and is presently estimated at less than one percent. Improved housing, hygiene, accessibility to medical care and antimicrobial therapy are probably the factors that contributed to this evolution⁴. Unfortunately, the socio-economic situation of the rural India has not changed much. Gulbarga district of Karnataka state is the most backward district of this state. The study was undertaken to assess the microbial profile of CSOM and to evaluate antimicrobial susceptibility of the organisms isolated from CSOM.

MATERIALS AND METHODS

Hospital based cross sectional study.

Inclusion criteria

250 patients who attended outpatient clinic of department of ENT at Government Hospital, Gulbarga, M. R. Medical College Hospital, Gulbarga, Basaveshwar Hospital, Gulbarga and K. B. N. Institute of Medical College General Hospital, Gulbarga were included in the study. The patients were from the age 8 months to 65 years of both the genders were included.

Exclusion criteria

Patients who have used topical or systemic antibiotic for the last 10 days were excluded from the study. All the patients with cholesteatoma and those with tumors occluding the (ear) canal were excluded⁴.

Sample collection

The external ear canal was cleaned with suction and then swabbed with ethyl alcohol followed by povidone iodine. The aspirations were performed under visual control with an Otomicroscope and secretions were collected in glass bottles⁵.

Processing of samples

The specimen was transported to the laboratory where it was processed routinely for culture of aerobic and anaerobic bacteria. Organisms were identified by standard bio-chemical methods^{6,7}.

Antibiotic susceptibility testing

Sensitivity to relevant antibiotics was determined by Kirby Bauer's disc diffusion method^{8,9} using commercially available antibiotic discs (Hi-media, Mumbai). Gram-negative and gram-positive cocci were tested for the following antibiotics; Ampicillin (10µg), amoxicillin (10µg), gentiamycin (10µg), cefotaxime (30µg), ciprofloxacin (10µg), ceftazidime (30µg), ceftriaxone (30µg), amikacin (10µg), ampicillin (10µg), and ofloxacin (10µg).

Extended spectrum β lactamase (ESβL) by double disk synergetic test

ESβL production was detected by placing a susceptibility disk containing amoxicillin-clavulanate (20/10ug) as the inhibitor of beta lactamase in the center of the plate and cefotaxime (30ug), ceftazidime (30ug), ceftriaxone (30ug) and aztreonam (30ug) disks at 30 mm (center to center) from the amoxicillin-clavulanate disk. Enhancement of the zone of inhibition of the oxyimino-lactam caused by the synergy with clavulanate in the amoxicillin-clavulanate disk was considered as evidence of ES L production¹⁰. *Escherichia coli* ATCC 25922 and *Klebsiella pneumoniae* ATCC 700603 were used as control strains. The results were tabulated as frequencies (NCCLS-1997, 2000, 2004).

RESULT

During the one year study period, 250 patients with CSOM and related problems at the various Hospitals at Gulbarga were included in the study.

Table 1 shows the age and sex distribution of our cohort. There were 155 male and 95 females, with an age ranging from 08 months to 65 years (mean 10.1 years). Nearly 30% of patients were younger than 10 years. 52% of the study subjects were from lower socio-economic status followed by 31.2% from middle and 16.4% from higher socio-economic status.

Table 1. Demographic characters of the CSOM patients

Age	Number of Patients	%
0-10	75	30.0
11 to 20	85	34.0
21-30	33	13.2
31-40	10	4.0
41-50	15	6.0
>50	32	12.8
Socioeconomic status		
Low	130	52.0
Middle	78	31.2
Higher	41	16.4
Sex		
Male	155	62.0
Female	95	38.0

250 swabs cultured yielded 272 bacterial isolates. Pure growth was obtained in 228 samples and mixed growth in 22 samples. Culture of the swabs revealed *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Staphylococcus aureus* were the most common bacteria isolated Table-2. Taken separately *Pseudomonas aeruginosa* isolated in 33.8%, *Klebsiella pneumoniae* in 23.9%, *Staphylococcus aureus* in 15.4%,

Proteus mirabilis in 11.8%, Citrobacter freundii in 5.9%, Streptococcus pneumoniae in 3.3%, and H. influenzae in 1.8%. Among the anaerobes, the predominant were the species of Bacteroides (2.2%) followed by Peptostreptococci (1.1%).

Antibiotic susceptibility pattern of the isolate is shown in Table:

Table 2. Microbial profile of CSOM

Organisms	No.	%
Pseudomonas sps	92	33.8
Klebsiella pneumoniae	65	23.9
Staphylococcus aureus	42	15.4
Proteus mirabilis	32	11.8
Citrobacter freundii	16	5.9
Streptococcus pneumoniae	12	4.4
H.influenzae	11	4.1
CONS	02	0.7
Anaerobic bacteria		
Bacteriodes	06	2.2
Peptostreptococci	03	1.1
Total	272	

Penicillins and cephalosporins

81.3% of gram-negative bacteria were resistance to amoxycillin, 95.6% to ampicillin 69.2% to cefotaxime, 50.0% to ceftazadime and 50.0% to ceftriaxone. Amongst all the gram-negative bacilli, Klebsiella pneumoniae had the largest percentage of resistance to amoxicillin (89.2%) (Figure 2) and Citrobacter freundii was 100% resistant to ampicillin (Figure 4). Pseudomonas aeruginosa was found to have maximum resistance to cefotaxime (82.6%) and for ceftriaxone (77.1%) when compared to other gram-negative bacilli.

Among gram-positive cocci, 85.7% of Staphylococcus aureus was resistant to ampicillin, 66.7% to ofloxacin, 61.8% to cefotaxime and 59.5% to ceftazadime and 52.4% to ceftriaxone (Fig. 3).

Aminoglycosides

92% of gram-negative bacilli and 76.2% of gram-positive cocci were resistance to gentamicin and 28.6% of gram-negative bacilli and 29.9% of gram-positive cocci were resistance to amikacin.

Ciprofloxacin

Over all rate of resistance for ciprofloxacin was 60.5%, with maximum resistance being exhibited by Pseudomonas aeruginosa (76%) (Fig. 1).

Of gram-positive cocci, all the isolates of Staphylococcus aureus, CONS were resistant to more than three antibiotics (Fig. 3). Cefotaxime, ceftazadime,

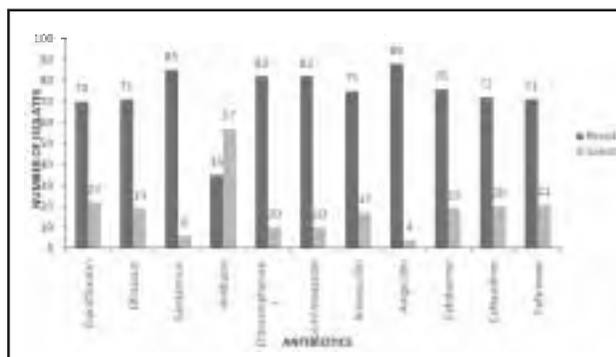


Fig. 1: Antibiogram of psudomonas SPS isolated from CSOM

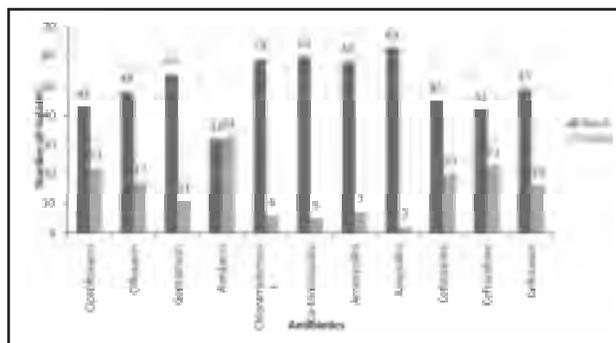


Fig. 2: Antibiogram of klebsiella speical isolated from CSOM

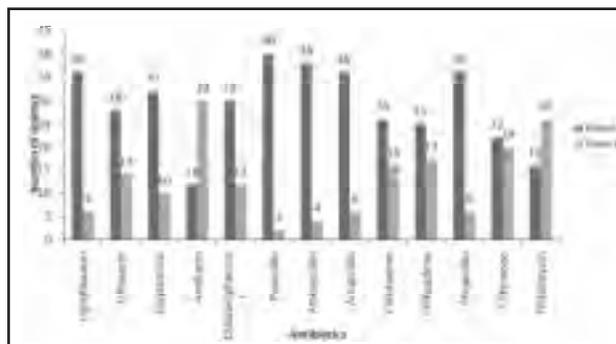


Fig. 3: Antibiogram of pseudomonas SPS isolated from CSOM

ofloxacin, netilmycin and amikacin had higher susceptibility to gram-negative and gram-positive bacteria compared to other drug.

Extended spectrum β lactamase (ESβL) mediated resistance:

Extended spectrum β lactamase (ESβL) mediated resistance was 25.4%. Pseudomonas aeruginosa (63.4%) was the predominant ESβL producer followed by Klebsiella pneumoniae (20.3%) and Proteus mirabilis (8.7%) (Table 3).

DISCUSSION

Chronic suppurative otitis media (CSOM) and its complications are among the most common conditions seen by otologists, pediatricians and general

The present study highlights the problem of CSOM in and around Gulbarga, District, Karnataka. Unhealthy practices, age of the patients and socio-economic status contributes for high prevalence of CSOM. Measures to provide regular screening programs, at schools, and health educations are essential to reduce the disease burden in the community. Usage of various plant juices and non-prescription drops is wildly prevalent in the present study. We found that despite the presence of accessible health care, patients were reluctant to seek medical attention. Approximately 68% of the patient with discharging ears had never sought a medical opinion. One of the reasons for this is ignorance regarding the implications of the disease. Another 22% were completely unaware that their children were suffering from CSOM.

CONCLUSION

Antimicrobial resistance is a growing problem worldwide and surveillance of resistance patterns is essential. Treatment efficacy and safety are the main concerns for the chronic of ototopical preparation. Hence It is essential to use antibiotics in proper way to prevent emergence and spread of resistant pathogens.

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A Study of Prevalence, Risk Factors and Clinical Profile of Neonatal Hypoglycemia

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ABSTRACT

Objectives: The objectives of the study was to know the prevalence of neonatal hypoglycemia, clinical presentation and the various risk factors resulting in hypoglycemia.

Method: Babies born in our hospital were screened for hypoglycemia. Babies having hypoglycemia at birth and babies with risk factors for hypoglycemia were included in our study. These babies were monitored for hypoglycemia by using glucose strips and confirmed by laboratory method for the first 72hrs and these babies were also observed for clinical presentation. Data collected was statistically analysed by using 't' test.

Results: The prevalence of neonatal hypoglycemia was 9.4% in our hospital with male to female ratio was 1.46:1. Study shown percentage of hypoglycemia is more common in infant of diabetic mother and in birth asphyxia (06.59% each) followed by meconium aspiration syndrome babies (04.30%). Hypoglycemia was more in Cesarean born babies 57.14% than other modes. Hypoglycemia was observed in significant number during first 24hours of life and symptomatic cases were only 36.27%. In Clinical presentation respiratory distress was the commonest symptom followed by jitteriness, lethargy; seizures and combination of all these symptoms were in large number. Hypoglycemia was common in preterm babies 54.94%. Hypoglycemia in intrauterine growth retardation babies was significant number 63%, off these asymmetrical intrauterine growth retarded babies were 71.42%. Neonatal hypoglycemia by laboratory(GOP)method was only 37.30%.

Conclusion: Hypoglycemia is a common metabolic disorder in neonatal period leading to brain dysfunction causing significant neonatal morbidity and mortality, it has to be evaluated and intervened early.

Key words: Clinical profile, Neonatal hypoglycemia.

INTRODUCTION

Hypoglycemia is the most common manifestation of failure of metabolic adaptation in the newborn, which is associated with significant brain dysfunction and neurodevelopmental retardation leading to significant cause of neonatal morbidity and mortality^(1,2).

The newborn during transition period must adapt from inutero transplacental delivery of nutrients to the postnatal situation of alternating periods of milk feeding and fasting. During this period newborn

glucose levels falls to a low point in the first two hours of life and then increase and stabilize at mean levels of 65 to 70 mg /dl by the age of 3 to 4 hours, later maintained by breast feeding. Blood glucose levels are frequently lower in newborn than in older children and adults and newborn baby depends upon glucose almost exclusively for its energy.

Recent studies have suggested that term appropriate weight for gestational age (AGA) babies are able to generate ketonebodies^{3,4} while preterm babies are less able to do the same⁵ suggesting that blood glucose monitoring should be carried out from birth and may be discontinued only if euglycemic levels are maintained.

Low birth weight (LBW) babies between 1500-2000gms who are appropriate for gestational age without any risk factors (except their LBW) are usually

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found to be vigorous and suck well at the breast. Available knowledge does not clearly tell whether these groups of babies are able to maintain euglycemic status when on breast-feeding in the first week of life. Hence, the present study was designed to monitor the blood glucose levels for the first few days of life with the initiation of breast feeds to find out whether these infants can remain euglycemic while on breast-feeding.

DEFINITION: "A blood glucose level <40 mg /dl in any infant regardless of gestational age and whether symptomatic or not"⁶.

The incidence varies from 0.5 to 15%⁵. It has been observed that 8% of large for gestational age (LGA) and 15% of small for gestational age (SGA) suffer from hypoglycemia whereas in preterm, it is 5 to 10%⁷.

MATERIALS AND METHODS

The present study, a prospective study was carried out in the Department of pediatrics in a reputed medical college hospital in Karnataka, India. The ethical clearance for study was obtained from the institutional review board. Newborn Babies delivered in Hassan Institute of medical sciences were studied in the first 3 days of life.

The selection criteria was; All newborns whose blood sugar at birth is <40 mg /dl and babies born as intrauterine growth retarded /preterm/Large for gestational age/Birth Asphyxia/Sepsis/Rh hemolytic disease of newborn/Babies born to Diabetic and Pregnancy induced hypertension mothers were followed up for first 3 days of life.

Eligible newborns were enrolled immediately after birth and Weight, gestational age was assessed⁸, a detailed maternal, obstetrical and natal history was recorded. The intrauterine growth retarded babies were divided as symmetric and asymmetric by using ponderal index.

Samples were taken by a painless heel prick puncture technique (capillary blood). Only reagent strips (dextrostix-Accu-Check sensor comfort) and glucometer-Accu-Check comfort (Boehringer-Mannheim-Roche), which is certified for use in newborns was used in the study.

The first sample was taken immediately after birth and if the baby was found to be hypoglycemic or if any of the risk factors are present baby will be followed up for the first 72 hours of birth with blood sample schedule as every 2nd hourly for first 12 hours and 4th hourly for next 12 hours. On 2nd day 6th hourly or depending on clinical findings and on 3rd day 8th hourly or depending on clinical findings. If a reading

of <40 mg/dl was observed anytime, blood sample will be sent for laboratory for confirmation and baby will be treated as per the protocol for neonatal hypoglycemia.

The clinical status of the newborn was noted in order to categorize the episode as symptomatic or asymptomatic hypoglycemia. If a baby remained euglycemic for the first 3 days of life, follow-up was terminated and concluded that no further screening required. In addition to the estimation of blood glucose, the general activity, vital signs, seizures, apnea, limpness, Jitteriness, Lethargy, Respiratory distress, Cyanosis are observed.

Blood glucose estimation done by glucose strips and Plasma glucose by glucose oxidase peroxidase (GOP) in laboratory.

RESULTS

Of the 965 babies born in our hospital 91 were found to be hypoglycemic with prevalence of 9.4% (Table 1), with male to female ratio being 1.46:1 and preterm being 54.94% (Table 2). Hypoglycemia in cesarean born babies were more (57.14%) compared to other modes. Nearly 57% found hypoglycemic in first 6 hours and 90% by 24 hours (Table 3). Study showed gestational diabetes mellitus (6/91) was leading risk factor in the mother for neonatal hypoglycemia followed by hypothyroidism (2/91), pregnancy induced hypertension (2/91) and in neonates, intrauterine growth retardation was leading cause followed by birth asphyxia (6/91), sepsis (4/91), Meconium aspiration syndrome (4/91), polycythemia (3/91) and Hyaline membrane disease (2/91). Study revealed (Table 4) statistical significance (p<0.005) in Intrauterine growth retardation babies (61.50%) and in birth weight between 1500gms to 2500gms (63.72%) for hypoglycemia but only 4.30% of babies were large for gestational age. Hypoglycemia in asymmetrical intrauterine growth retarded babies was more common 71.42%.

Table 1. Prevalence of hypoglycemia

Factor	No of cases	Hypoglycemia prevalence
Hypoglycemic	91	9.40%
Euglycemic	874	91.60%

Table-2: Hypoglycemia in term VS preterm babies

Factor	(Hypoglycemic- 91)	Hypoglycemia in percentage
Term	41	45.05%
Preterm	50	54.94%

Table 3. Hypoglycemia in relation to time of birth

Time in hours after birth	Cases with hypoglycemia(91)	Percentage of hypoglycemia
1 st hr	16	17.58%
2 nd hr	25	27.47%
3 – 6 th hr	11	12.08%
7 – 24 th hr	31	34.06%
24 – 48 th hr	08	08.79%
48 – 72 nd hr	00	00.00%

Table 4. Hypoglycemic babies in relation to intrauterine growth

Factor	No of cases(91)	Percentage of hypoglycemia
LGA	04	4.30%
AGA	31	34.06%
SGA	56	61.50%

In SGA babies asymmetrical were 71.42 % (40/56)

The hypoglycemia in asymptomatic babies (63.73%) showed statistical significance ($p < 0.005$) and In symptomatic cases (Table 5) respiratory distress was the common symptom (9/33), followed by jitteriness (5/33), lethargy/poor feeding (4/33), seizures(3/33)and combination of all these symptoms were in majority (12/33). off these 44% (22/50) were preterm and 26.80% (11/41) were term babies. Hypoglycemia detected by laboratory (GOP) was only 37.30% compared to glucometer because plasma glucose is 15% higher than capillary blood.

Table 5. Clinical features observed in neonatal hypoglycemia

Clinical features	No of Cases with symptoms (33)	Percentage of hypoglycemia
Jitteriness	05	15.15%
Lethargy/ Poor feeding	04	12.12%
Seizures	03	09.09%
Respiratory distress	09	27.27%
Combination of symptoms	12	36.36%

Asymptomatic babies being 63.73 % (58/91)

DISCUSSION

Many studies have revealed hypoglycemia is more common in neonates during early hours of birth due to maternal, fetal cause or both⁹⁻¹². Previous studies^{10,13} have shown preterm and intrauterine growth retarded babies were at greater risk for hypoglycemia along with other factors, so frequent blood glucose monitoring and early intervention is necessary within 72 hours of birth as it is the time for both neonate and mother who require sometime to establish effective breast milk feeding.

The present study shows that prevalence of hypoglycemia 9.4% is well within the range (0.5%-15%) as observed in various studies^{7, 10, 11}. Hypoglycemia in male babies were 59.34% which was comparable to studies done by Plides et al¹⁴ and Cornblom.M. et al¹⁵. In our study hypoglycemia was more in first 24 hours of birth, similar results were observed in Shelly and Neligan, Campbel et al. Mc Kittrick and M. Bhalla et al. Our study showed that preterm babies with hypoglycemia was 54.94% when compared to Studies done by Singhal PK et al¹⁶ Lubchenko et al¹⁰ and Beard et al³ which was 20.6%,67% and 34.14% respectively. Off the cesarean born babies 54% had hypoglycemia which was comparable to studies done by Musthaq Ahmad Bhat, Anil Bhansali et al¹⁷.

Asymptomatic babies in our study was 63.73% when compared to studies done by Haworth et al, Brown and Walli's, Cornblom et al^(1,18) where it was 84.28%, 67.38% and 75% respectively. Present study showed 61.56% of babies with hypoglycemia as intrauterine growth retarded babies when compared to other studies where it was only 17% in Singhal PK et al and 32.80% in Lubchenko et al^{10,16} and asymptomatic intrauterine growth retarded babies in our study were 71.42% comparable to other studies^(19,20) where they also showed higher percentage.

Clinical presentation in our study showed respiratory distress 63.63% as more common symptom followed by jitteriness 51.51% and lethargy/poor feeding 48.48%, when compared to AlkaKhadwal et al²¹ where jitteriness and lethargy/poor feeding (50.70%) were more common in combination. The risk factor for hypoglycemia in our study was highest in intrauterine growth retarded group (61.50%) when compared to other studies where it was preterm babies^{16,17}. Hypoglycemia in asymmetrical intrauterine growth retarded babies were significantly high 71.42%. The maternal risk factors were observed in 10.98% of cases.

When compared to glucometer, hypoglycemia observed in neonates by laboratory (GOP) method was only 37.30% (34/91) as we know plasma glucose level is 15% more than capillary blood which is comparable with study done by R Boyd, B Leigh, P Staurt²².

Summary: A total number of 965 babies were screened for hypoglycemia in first 3 days of life. Hypoglycemia was observed in 91 (09.40%) cases with M: F 1.46:1. Hypoglycemia was observed in 57.14% of cesarean born babies compared to other modes (42.86%). Hypoglycemia was observed in large number of cases 56 % (51/91) with in first 6 hours of life and 90% had hypoglycemia by 24 hours. Most common risk factor for hypoglycemia was Intrauterine growth retardation (61.50%) off which asymmetrical

type being 71.42 % (40/56) and maternal risk factors were observed in 10.98% (10/91) of cases. Hypoglycemia observed in preterm was 54.94 % (50/91) and 43.88% of babies were of gestational age between 32-36weeks. Hypoglycemia observed in 63.72%of neonates were of weight between 1.5-2.5kg. Symptomatic babies were 36.27% (33/91) with common symptom being respiratory distress 27.27 % (9/33) where as combination of symptoms were found in 36.36 % (12/33) of babies. Only 37.30% of hypoglycemic neonates found to hypoglycemia by laboratory (GOP) method.

CONCLUSION

The present study shows that significant (9.4%)number of neonates developed hypoglycemia whether they are symptomatic or not during first few hours of life which is a significant number indicating need for evaluation and early and frequent feeding is necessary to prevent hypoglycemia otherwise it may result in significant effect on developing brain leading to morbidity and mortality. Majority of neonates return to euglycemic state by around 72hours of life regardless whether breast fed or started on IV dextrose. Preterm and intrauterine growth retarded babies were at significant risk for hypoglycemia needs to be monitored.

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A Study of the Effectiveness of Ultrasound in Diagnosing Infantile Pyloric Stenosis

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ABSTRACT

Objectives: To evaluate the effectiveness of ultrasound for diagnosis and exclusion of pyloric Stenosis in the infants with nonbilious vomiting.

Methodology: In a cross-sectional study, 444 consecutive infants with clinical suspicion of pyloric Stenosis were evaluated by ultrasound (US) and categorized as pyloric Stenosis or not according measuring parameters as muscle thickness, muscle width and canal length of pylorus. Positive findings were confirmed at surgery; Negative findings were confirmed by means of follow up. Sensitivity, specificity and accuracy were calculated.

Results: Sensitivity, specificity and accuracy of ultrasound were 100% if pyloric muscle thickness of ≥ 3 mm was chosen as diagnostic. When muscle thickness more than 4mm was used, sensitivity, specificity and accuracy were 96%, 100% and 99.32% respectively.

Conclusions: Ultrasound is highly sensitive and specific if pyloric muscle thickness 3 mm is used as cut off point. By virtue of direct visualization of the pyloric muscle, ultrasound is method of choice for both the diagnosis and exclusion of pyloric Stenosis in infants.

Key words: *Diagnosis, Infant, Pyloric stenosis, Sensitivity and specificity, Ultrasonography.*

INTRODUCTION

The diagnosis of infantile pyloric Stenosis basically has been relegated to ultrasound in some centers. However, there is controversy about the role of ultrasound especially when the diagnosis is mostly relied on the muscle thickness. Hypertrophic Pyloric Stenosis (HPS) is a cause of non-bilious progressive vomiting between the first week and fifth month of life^{1,2}. HPS prevalence increases in male gender, in first child, white race, positive mother familial history, geographic districts, O and B blood groups and macrolid usage during pregnancy^{2,3}. Some of its differential diagnosis during infancy are; Pylorospasm, gastro esophageal reflux (GER), duodenal stenosis or obstruction and malrotation^{1,2,4}. Clinical exam (Olive sign), measuring gastric residue, endoscopy, upper gastrointestinal series (UGI) and recently ultrasound are used for diagnosis^{2,4,5}.

The clinical diagnosis of HPS has traditionally been made by palpation of an olive-shaped mass in the epigastrium, representing the hypertrophied muscle (49-87%)^{2,4}. Imaging studies are indicated when the clinical findings are unclear or equivocal¹.

The use of ultrasound in the diagnosis of hypertrophic pyloric stenosis was first reported in 1977, by Teele and Smith by direct visualization of pyloric muscle⁶. Since then however, controversy on the definition of the abnormal dimension(s) of hypertrophied muscle continues^{1,4,7,8}. Three, 3.5 and 4 mm are used as cut- off points for pyloric muscle thickness^{1,2,4,8,9}. According to the relation of HPS prevalence to race and geographic districts, this study was designed choosing appropriate pyloric measurement for Iranian infants.

METHODOLOGY

This is a cross-sectional study with simple sampling method. Four hundred and eighty five consecutive infants with progressive, non bilious vomiting and/or regurgitation were examined between February 2003 and February 2008. Forty one cases are excluded

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due to other findings which were confirmed as sepsis, metabolic disorder or not doing Ultrasound at all. Remaining 444 study population cases had Ultrasound.

All images were obtained on a GE Pro 3 machine with use of either 5, 7.5 or 10 MHz transducers as linear or curvilinear probes. Infants were in supine or right posterior oblique position for better identification of pylorus in the longitudinal axis. Measurements were taken at the center of the pylorus, defined as the site of the pyloric lumen and identified by the double track sign of the pyloric mucosa to avert inaccuracy from tangential scans. The length of pyloric canal was measured from base of duodenal cap to the gastric antrum. The width of the canal was measured from outer edge of the muscle in both sides including the double layer of mucosa & central lumen. The muscle thickness was measured in the standard manner, from the outer wall of the pyloric muscle to the outer edge of the mucosa, which thus included the thickness of one muscle layer and excluded the mucosa and lumen.

A positive diagnosis of HPS was made when a persistent olive-like mass was found in place of the normal pyloric channel, with a muscle thickness of 3 mm or more. Three mm is used to including more cases and not missing them for surgery. Positive findings were confirmed surgically.

Negative diagnosis of HPS was made if either normal pylorus (consisted of an adjacent antrum and duodenal cap without as interposed, measurable canal length or muscle thickness was less than 2mm) or borderline cases with muscle thickness 2-3mm for the latter cases, follow up ultrasound were performed to confirm pylorospasm or ongoing early HPS. All negative cases were confirmed by follow-up clinic visits and if needed repeating ultrasound or using UGI. Demographic data, gestational age, blood group, familial history, physical exam (olive sign) and coexistent anomalies were also determined.

RESULTS

Four hundred forty four cases with non-bilious vomiting were evaluated by sonography. Seventy five patients were HPS positive with pyloric thickness of 3mm or more on Ultrasound. All cases were confirmed with surgery. Three cases had pyloric thickness between 2-3 mm without morphologic signs of HPS (pylorospasm). Therefore follow up ultrasound and observation was done. During two weeks pyloric thickness decreased below 2mm.

Three hundred and sixty six cases had normal pylorus which was confirmed by follow up. Pyloric length was between 16-28 mm (20.22 ± 2.33), width 8.7-

17 mm (13.14 ± 1.97) and thickness 3-6.50 mm (4.94 ± 0.65). The Histogram of pyloric muscle thickness is illustrated in Figure 1. Seventy five HPS-positive cases were aged 16-180 days (mean 40.26 ± 23.28 SD); which included 63 boys (84%) and 12 girls (16%). Their weight ranges were 1900-4300 gram (mean 3303.60 ± 499.89 SD). Seventy three cases (97.3%) were term and two (2.7%) preterm.

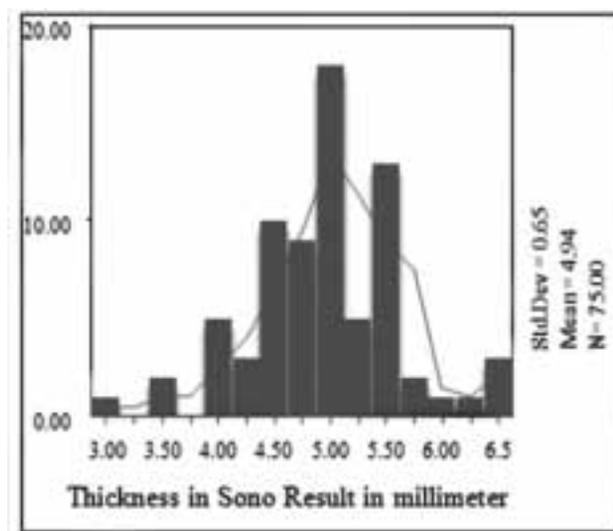


Fig. 1: Histogram of Pyloric Muscle Thickness at Ultrasound

By choosing muscle thickness 3mm or more as diagnostic for HPS, sensitivity, specificity and accuracy were 100%. When muscle thickness more than 4mm was used, sensitivity, specificity and accuracy were 96%, 100% and 99.32%.

DISCUSSION

Infantile hypertrophic Pyloric Stenosis results from a defect in the pyloric contractility or relaxation, which result in hypertrophy of the antropyloric muscle^{2,4,9}. Accurate measurement of the antropyloric canal and its muscle is important in the diagnosis of HPS. Cohen and Haller suggested measuring the length, width and thickness of the pylorus for depicting HPS while muscle thickness is the most reliable measurement and the width is the least reliable one^{4,10}.

Mean of pyloric length in Assefa study on 39 patients was 19.1mm¹¹. Wilson and Vanhoutte suggested the length higher than 20 mm diagnostic for HPS¹². Our study shows 20.22 mm as mean of the length in HPS group. In Strauss study pylorus width more than 15mm was determined as abnormal¹³. In Assefa study the mean of pyloric width was 14.05 mm¹¹. In our study the mean was 13.14±1.97mm.

The mean of Pylorus muscle thickness was 4.46 mm in Assefa study¹¹. In Blumhagen studies thickness more than 4mm was suggested as diagnostic for HPS^{14,15}.

However Swischuk study concluded that muscle thickness 3mm or more as HPS, less than 2mm as normal and 2-3mm as borderline cases which need follow up⁸.

In our study pylorus muscle thickness was between 3-6.5mm by 4.94 ± 0.65 mm mean similar to other studies. With using muscle thickness 3mm or more as diagnostic for HPS, all 74 patients were HPS true positive (without false positive or false negative case). Our results were similar to Marta Hernanz- Schulman study in which sensitivity, specificity and accuracy were 100%⁷. By using 4mm as cut off point for the diagnosis of HPS (according to Nelson text book 2004), we missed diagnosis of HPS in three cases which was surgically confirmed HPS and had muscle thickness between 3-4mm.

Demographic data including age and sex were also almost similar in our group with previous studies. However, blood groups O and B were the most prevalent blood groups among HPS patients in other studies². In our study O+ 44% and A+ 20% were the most prevalent blood groups.

Palpation of Olive in Oates and Macdessi study was positive in 87% and it was 48% during 1988-1991.16 Clinical olive sign was seen in 33.3% of our cases. In other studies positive Olive sign was between 40-100%^{10,17}. It seems that over the time physicians get more dependent on sonography.

In conclusion, Ultrasound is highly sensitive and specific if pyloric muscle thickness of 3mm is used as cut-off point. By virtue of direct visualization of the pyloric muscle, ultrasound is the method of choice for both diagnosis and exclusion of pyloric stenosis.

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A Study of Transvaginal Ultrasound in Asherman Syndrome

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ABSTRACT

Objective: To determine the accuracy of transvaginal ultrasound in evaluation of uterine sonomorphology in nongestational amenorrhoea following curettage procedures (Asherman Syndrome).

Methodology: The study population comprised all adult females in reproductive age group who presented with amenorrhea following a curettage procedure. Those with positive serum BHCG, and raised serum prolactin were excluded. Transabdominal (TAS) as well as transvaginal ultrasound (TVS) scan was carried out in all patients. Hystero-salpingography (HSG) was done in nearly all patients. Age, parity, indication for referral and curettage, duration of amenorrhea, frequency of curettage and previous menstrual and obstetric history, were obtained. Transvaginal scan findings were recorded and compared with HSG. Two patients came for a follow up after adhesionolysis.

Results: There were 17 patients in all with a mean age of 28.6 years, mean parity of 4.5 and mean amenorrhea duration of 5.5 months. Sixteen were primarily referred for evaluation of amenorrhea. Twelve had history of previous pelvic infection, 8 had previous menstrual irregularity and 15 had abortions. Repeat curettage was done in 09 patients. Trans abdominal ultrasound was positive in only one patient and transvaginal ultrasound was positive in all cases. Findings on the later examination included normal to thickened endometrium with heterogeneous echo texture, irregular outline, non-shadowing echogenic foci and sparse sub-endometrial vascularity. Calcification at endo-/myometrium junction was seen in one case on both techniques. The sensitivity of TVUS in diagnosing intra uterine adhesions was 92%, specificity 100%, positive predictive value 100% and negative predictive value 92%.

Conclusion: Transvaginal ultrasound shows accurate and specific uterine sono-morphologic features in traumatic amenorrhea and can be used as a reliable screening test.

Keywords: Asherman syndrome, Amenorrhea, Curettage, Intrauterine adhesions, Endometrium, Transvaginal ultrasound.

INTRODUCTION

Intrauterine adhesions and synechiae resulting from trauma, commonly curettage, is called Asherman syndrome¹. It may also result from other uterine interventions such as caesarian section and myomectomy, rarely from genital infections such as chlamydia, tuberculosis, and schistosomiasis² and even the presence of a foreign body. It usually leads to amenorrhea, hypomenorrhea, habitual abortion and secondary infertility. It is also called Fritsch- Asherman syndrome and the earliest descriptions date back to a

single case description by the Austrian gynecologist Ernest Werthien (1864-1920)¹.

Generally regarded to be an uncommon finding³, the prevalence following secondary removal of placental remnants or repeat curettage may be as high as 40%⁴. Otherwise the estimated occurrence is 1:100 post partum curettage procedures⁵. It can strike any woman undergoing virtually any intrauterine procedure. The condition is under diagnosed due to non-visualization of cavity on hysterosalpingography (HSG), which is the usual method of evaluation^{3,4}. However endovaginal ultrasound has unique characteristics, which allow its utilization in the evaluation of this equally unique mucous membrane that lines the uterine cavity and correct evaluation of severity of adhesions helps in predicting the response to therapy^{6,7}.

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The objective of this study was to determine the accuracy of transvaginal ultrasound scanning (TVS) in evaluating the morphology of endo and myometrium in cases of Asherman syndrome following curettage.

PATIENTS AND METHODS

Adult married female with history of amenorrhea of more than 2 months duration following a curettage procedure, referred for an ultrasound evaluation were included. Those with raised B-HCG, visible gestational sac on ultrasound, raised serum prolactin levels or not consenting for endovaginal scanning were excluded. Scanning was done per abdomen and vaginum. Age, duration of amenorrhea, indication of curettage and then referral, number of times curettage was performed, and past menstrual and obstetric history as well as uterine appearance in terms of endometrial thickness, regularity, echotexture and vascularity were noted.

HSG was done in all cases except one and was taken as the gold standard against which the sensitivity, specificity, positive and negative predictive values were determined. Only two patients came for follow up after 6 months.

RESULTS

There were a total of 17 patients. Out of them 16(92%) were referred for evaluation of non gestational amenorrhea and 1 (8%) for base line evaluation of prior to hormone replacement therapy. Mean age was 28.6 years (range 23-48); mean parity was 4.5 (range 0-7) and mean duration of amenorrhea prior to scanning was 5.5 months (range 3-37 months). Indication for last curettage was retained products of conception in 15 (88%) and with full abortion to 1402 (12%). Curettage was done once in 8 patients (48%) and two or more times in 9 (52%). History of pelvic infection was present in 12 patients (70.5%); history of abortion was available in 15 (88%) patients including two willful abortions while 07 (47%) had previous menstrual irregularity.

Trans abdominal scan was normal in 16 patients with only one patient showing positive finding of extensive irregularly arranged sub endometrial calcifications. TVS was positive in all 17 patients which included normal to thickened endometrium, heterogeneous echogenecity, irregular outline, sparse sub-endometrial vascularity and discrete regularly arranged calcifications at endometrium/ myometrium junction.

Sensitivity of TVS was 92%, specificity 100% and PPV was also 100%. Distal extent of changes correlated well with the proximal extent of cavity seen on HSG.

Two patients came for follow up after 06 months following hysteroscopic adhesionolysis and IUCD insertion. Both showed normal layered endometrium with multifocal vascularity.

DISCUSSION

The results of this study show that uterine cavity hidden by adhesions on HSG, is adequately visualized on TVUS giving a fairly accurate idea of the extent of endometrial abnormality. Hysteroscopy and hysterosalpingography are the usual diagnostic modalities for this condition^{6,8}. While hysteroscopy is invasive, HSG causes significantly more pain in amenorrhic than in menstruating women⁹. It is also reported that the presence of calcified or ossified tissue in endometrium can go undetected on HSG as well as MR while it can be visualized by TVUS¹⁰. It is therefore logical to utilize trans vaginal ultrasound as a modality of choice that may alert the gynecologist to the possibility of intra uterine synechiae¹¹.

The data extracted in this series highlights some important comparative aspects. There was history of infection before or after procedure in majority of these patients as was the history of abortion. This coincides with Westerndrop et al. who had pointed to a mildly increased risk in such cases⁴. The same researchers have also found a significant (12 –fold) increased risk of acquiring Asherman syndrome in women with previous menstrual irregularities. Eight of our 17 patients also had menstrual cycle and volume irregularities in the past. Just over half of these patients were repeatedly curettaged. Repeat curettage or secondary removal of products of conception/ placental remnants can increase the prevalence of intra uterine adhesions up to 40%⁴.

Endovaginal ultrasound is often superior to transabdominal ultrasound in evaluation of endometrial abnormality^{12,13}. This is again demonstrated in this study where transabdominal ultrasound could detect only gross calcifications while TVUS could detect subtle endometrial changes. Other researchers also note these changes of endometrial thickness, altered echogenecity and irregularity. Mendelson et al. associated these changes with Asherman syndrome apart from early pregnancy, decidual reaction, endometrial carcinoma, and reaction to intra-uterine contraceptive device¹². Cofino et al. also recommend ultrasound for evaluation and follow up of intra uterine adhesions¹¹. They described the adhesions as dense intrauterine lines, which disappeared after adhesionolysis. Only two patients in our series came for follow up after adhesionolysis. Both of them showed normal layered pattern of endometrium with increased sub-endometrial

vascularity than before. It must be stressed that the vascularity changes as seen in this study are not described in literature previously.

The extent of adhesion formation correlated with the HSG findings. The extent of adhesions determines the severity, grading (from I-IV on an ascending scale) and outcome⁴. Patients in whom fundus is completely obscured or those with narrowed fibrotic cavity are therapeutically more challenging than mild endometrial type adhesions⁶. These adhesions are persistent and may deform a pregnancy sac¹⁴. However milder type may even resolve spontaneously after 8 months¹⁵ which may be the probable reason of some patients being lost to follow up as a majority (58%) of our patients had amenorrhea of less than twelve months duration.

The high sensitivity, specificity and PPV of TVUS in our series is comparable to that with Fedele et al¹⁷. who found a sensitivity of 91% with equal specificity and PPV i.e. 100% as ours. The superiority of transvaginal ultrasound also corresponds with Mendelson et al. observation of transvaginal scan having superior image quality over transabdominal scan¹².

CONCLUSION

Transvaginal ultrasound is a noninvasive, specific and sensitive imaging technique that detects subtle endometrial abnormalities caused by intra uterine adhesions following a curettage procedure. It can be used as an adjunct to hysterosalpingography for evaluation of the extent of adhesions.

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A Two Year Prospective Study of Evaluation of the Role of Ultrasonography in Various Retinal and Choroidal Disorders in Western Uttar Pradesh

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ABSTRACT

50 eyes of 50 patients referred from outdoor patient department and casualty department were examined by ultrasound- B-mode in department of radiology of Saraswathi Institute of Medical Sciences, Hapur. A membrane-like echogenicity was found between the retina and the choroids. The acoustic characteristics were studied. The usefulness for the differential diagnosis of retinal and choroids detachment was demonstrated with several situations of the choroido-retinal pathology. The thickness of the retina and choroids can be measured in routine examinations. B mode ultrasonography will be helpful in the evaluation of retina and choroids in the post traumatic and post surgical cases.

Keywords: Asherman syndrome, amenorrhea, curettage, intrauterine adhesions, endometrium, trans-va

INTRODUCTION

The ultrasonography is becoming an important part of diagnosis in various diseases of human organs including Retina and choroids. The ultrasonography is also becoming useful in the soft tissue abnormalities. The macula is the site of central vision within the retina. The retina is oxygenated by the underlying choroid. These tissues are less than 1 mm thick in total. While optical techniques can reveal much about the structure of the retina, ultrasound allows imaging of the choroid and deeper tissues. This study will investigate use of high frequency (7.5-10 MHz) ultrasound for imaging of the retina and choroid in patients with age-related macular degeneration, a prime cause of blindness. The investigation will involve use of novel post-processing methodologies to achieve maximum resolution of the fine tissue structures involved in this disease.

MATERIALS AND METHODS

This prospective case controlled randomized study was performed in department of radiology, Saraswathi

Institute of medical sciences Hapur, India from Jan 2009 to Jan 2011. The study was started only after taking permission from the institutional ethical committee. The study was performed on 50 patients visiting ophthalmology OPD/IPD of Saraswathi Institute of Medical Sciences, Hapur (UP) with the complaints like blunt trauma of eye, post surgical problems. The High frequency (7.5-10 MHz) ultrasound for imaging was used for the study. The scanning was done with patient lying supine, when the pull of gravity is exerted in the direction of the optic axis. The patients were instructed to close the eyelid throughout the examination. Both eyes were examined in all the patients. The eye was observed as it is from side to side and up and down to identify the membranous structure. The open globe injuries in patients were not included in the present study. In case of ocular trauma or recent ocular surgery care was taken to ensure that the pressure is not applied to the globe in order to minimize the possibility of causing expulsion of intraocular content from an occult rupture globe. The fasting blood sugar investigation was also performed to rule out diabetes. Detailed local examination of the orbit was carried out along with complete general examination and systemic examination of the patient. The history was recorded in preset questionnaire as a baseline record.

The High frequency (7.5-10 MHz) ultrasound for imaging was used for the study. The scanning was

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done with patient lying supine, when the pull of gravity is exerted in the direction of the optic axis. The patient was instructed to close the eyelid throughout the examination. Both eyes were examined in all the patients. The eye was observed as it is from side to side and up and down to identify the membranous structure. The open globe injury inpatients were not included in the present study. In case of ocular trauma or recent ocular surgery care was taken to ensure that the pressure is not applied to the globe in order to minimize the possibility of causing expulsion of intraocular content from an occult rupture globe. The fasting blood sugar investigation was also performed to rule out diabetes. Detailed local examination of the orbit was carried out along with a complete general examination and systemic examination of the patient. The history was recorded in preset questionnaire as a baseline record.

OBSERVATIONS

Table 1. Showing Status of Retina and Choroids

S. N.	Chorioretinal Status	No. of cases	%
1.	Normal	19	38
2.	Total Retinal detachment	5	10
3.	Partial retinal detachment	1	2
4.	Retinal detachment with ocular mass	4	8
5.	Retinal detachment with retinal echoes	3	6
6.	Retinal detachment with sub retinal echoes	1	2
7.	Choroidal detachment	3	6
8.	Thick chorio-retinal layer tear	3	6
9.	Foreign body embedded in chorio-retinal layer	3	6
10.	Not visualized adequately	5	10
11.	Coloboma	2	4
12.	Disrupted	1	2
	Total	50	100

Table 2. Shows the various lesions and their radiological presentation in choroids

Lesion	Location	Shape	Vascularity
Melanoma	Choroid	Dome	+
Metastatic carcinoma	Posterior choroid	Diffuse/regular	-
Choroid haemangioma	Posterior choroids	(temporal) Dome	-
Choroidal naevus	Choroid	Dome	+
Disciform lesion	Macula	Dome/irregular	-
Choroidal Hemorrhage	Choroid	Dome	-

After completing the ultrasonographic study we observed that out of total 50 patients 19(38%) cases had normal appearing chorio-retinal layer where as 5(10%) cases had total retinal detachment and only 1(2%) case had partial retinal detachment (Table-1). Retinal cyst was associated with retinal detachment in 3(6%) cases. Retinal detachment with sub retinal echoes i.e. hemorrhage seen in only 1(2%) case. Ocular mass associated with retinal detachment was seen in 4(8%) cases. Choroidal detachment was also observed in only 3(6%) cases. Thickened chorio-retinal layer was seen in 3(6%) cases. The causes were Phthisis bulbi, uveitis and thyroidal ophthalmopathy. Foreign body embedded in chorio-retinal layer seen in 3(6%) cases. Fundal coloboma was seen in 2(4%) cases. Chorioretinal anatomy was observed to be disrupted in 1(2%) case. The Chorioretinal layer was not visualized in 5(10%) cases due to the large intraocular mass with possibility of retinoblastoma. Choroidal melanoma and choroidal nevus were vascular lesions diagnosed.

DISCUSSION

Ultrasonography is safe, quick, noninvasive, non ionizing method of imaging the eye, especially when light conducting media is opaque as in case of trauma,

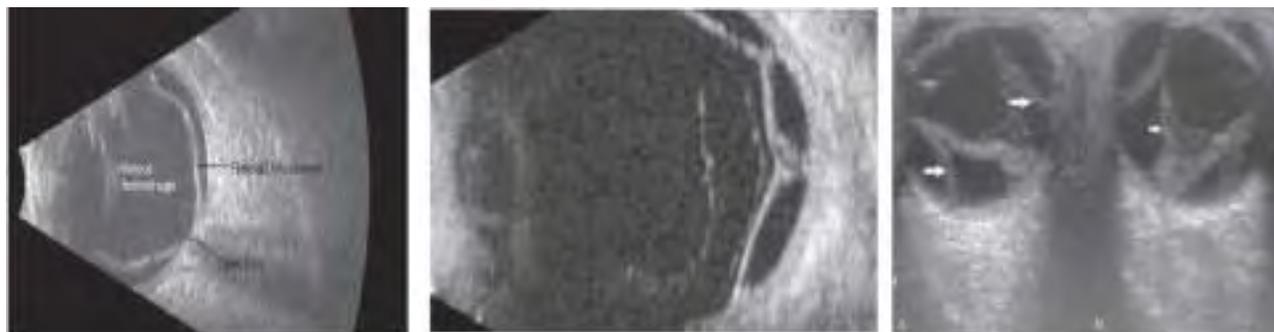


Fig. 1: Sonographical Images of Retinal Detachment



Fig. 2: Sonographical Images of Choroidal Detachment

rendering direct vision by ophthalmoscopically difficulty. Out of 50 cases with ocular disease retinal detachment was detected in 14 cases (28%) out of which 5 cases (10%) were with total retinal detachment which is seen as funnel shaped membrane extending from the ora'serratas to the optic disc posteriorly. Appearance was in concordance with those of Kerman et al in 1978. Characteristic ultrasonographic patterns of retinal detachment in a variety of clinical circumstances are demonstrated and discussed. Uncomplicated retinal detachment consists of ultrasonically detected retinal detachment without associated pathology in the vitreous, sub retinal space, or choroid. The simultaneous detection of lesions in one or more of these areas may be a source of diagnostic confusion. Acoustic diagnostic criteria for differentiation of associated conditions in complicated retinal detachments are demonstrated and discussed. Thought we studied with B mode ultrasonography in variety of cases it is suggested that both High resolution A-scan and B-scan ultrasonography will be able to provide a method for detection and diagnosis of retinal detachment, associated ocular pathology, and simulating conditions. It can be concluded that ultrasonography is an ideal diagnostic modality for ocular regions especially in opaque media and an excellent screening modality for lesions which can not be diagnosed clically.

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Thyroid Disorders in Pregnant Women

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INTRODUCTION

Pregnancy is usually associated with normal but significant and reversible physiological change that asserts growth and well-being of the fetus. Biochemical tests of thyroid hormones clearly reflect these adaptive changes & distinctly different from non-pregnant women.

Pregnancy changes the normal iodine balance, immunity and thyroid function. For the well-being of the mother and fetus, the thyroid function abnormality is to be recognized and treated. Interpretation of thyroid function should be done cautiously considering the normal physiological alterations as found in this study.

2-5% of women suffer from various thyroid disorders. 1-2% of them are in reproductive age.

Importance of thyroid function tests during pregnancy found are as follows:

At the first 10-12 weeks of pregnancy, the fetus is totally dependent on the mother for thyroid hormones.

From the 2nd trimester, the fetal thyroid starts functioning and thyroid hormones are essential for CNS development. Mother supplies the iodine needed via placenta. Iodine deficiency in mother may give cretinism of the newborn.

Correct diagnosis and treatment of the thyroid dysfunction are important for preventing mother and fetal complication. Physiological changes of thyroid function during pregnancy should be considered for result interpretation.

Key word: TSH=Thyroid stimulating hormone, FT4=Free thyroxin, FT3=Free triiodothyronin, Anti-Tg=Antibody to thyroglobulin, Anti-TPO=Antibody to thyroid peroxisome

MATERIALS AND METHODS

20000 pregnant women from the pre-natal check-up clinic at Midnapore Medical College, SSKM

Hospital and Medical College were chosen for the study over a period of 5 years.

Along with routine blood tests and urine examination, thyroid function tests (TSH, FT4, FT3, Total T4, Total T3, T3 Resin uptake, Free T4 index) and FNAC in relevant cases were performed.

They were followed till term and delivery. They were grouped into NORMAL with due consideration of physiological alterations as supported by literature and ABNORMAL. The results were retrospectively analyzed and interpreted.

RESULTS

Normal Physiological Changes Found

ASSAYS	1st Trimester	2nd Trimester	3rd Trimester
TSH	Normal or decreased	Normal	Normal
FT4	Normal	Normal	Normal
FT3	Normal	Normal	Normal
Total T4	High	High	High
Total T3	High	High	High
T3 Resin uptake	Low	Low	Low
Free T4 index	Normal	Normal	Normal

Normal and Abnormal Thyroid Pathology Observed

	Number	Percentage
Normal	17794	88.9%
Hypothyroidism	100	0.5%
Hyperthyroidism	40	0.2%
Goiter	2000	10.0%
Thyroid Nodules	20	0.1%
Thyroid Cancers	1	0.005%
Postpartum Thyroiditis	30	0.15%
Postpartum Grave's Disease	15	0.07%

DISCUSSION

During pregnancy, there is slight enlargement of the thyroid gland and its metabolic rate is increased. The changes during normal pregnancy as found in the literature are:

- a) Enhanced placental uptake of iodine-iodine is transferred to the fetus.
- b) Increased maternal renal clearance of iodine during pregnancy. Due to reduced availability of iodine, the TSH levels are raised to meet the demand. With advancement of pregnancy, serum TSH values were found to be increasing above the higher limit of normal non-pregnant women. Therefore reference range of TSH values significantly overlaps with those of non-pregnant women. Significant increase in serum TBG, Thyroglobulin, Total T4 and Total T3-serum TBG increase 2.5 folds during pregnancy (peak at 21st week). This increase is caused by increased estrogen secreted by placenta. As a result there is rise in total T3 & T4 levels in the first and second trimesters, continued up to third trimester of pregnancy and then shows a decline till term. They probably help fetal development. Increased plasma value along with increased TBG results in increased production of total T4. By 4-6 weeks postpartum, serum TBG, T4 & T3 return to pre-pregnancy level.
- c) Serum thyroxin binding pre-albumin concentration do not change or decline slightly during pregnancy. Hypo-albuminaemia also occurs.
- d) Serum FT3 & FT4 concentrations are usually within the normal range. But the mean values are in the upper normal range or just above it. Early in pregnancy when serum HCG concentration are highest & decreased to the lower normal range in the third trimester.
- e) Stimulation of thyroid by HCG secreted by placenta, closely simulating luteinizing hormone & have weak thyrotropic activity. HCG having identical alpha subunit to TSH & has weak thyrotropic activity. TSH & HCG are similar enough that HCG can bind & transfer signal from TSH receptor on the thyroid epithelial cells. HCG titer reaches its peak towards the end of first trimester. Serum TSH titers show a decrease only during the first trimester of pregnancy because of negative correlation with HCG levels. Maternal serum TSH level returns to normal in 2nd trimester and then rise in the 3rd trimester. FT4 also increase with suppression of TSH and later on decreases during later gestation.

- 1) Enzyme Type III de-iodinase secreted from the placenta converts T4 to T3 and reverse. T3 (rT3) and also T3 to de-iodothyronine (T2).
- 2) Tg is increased frequently during pregnancy, reflecting the increased activity of the thyroid during pregnancy. The increase in thyroglobulin can be seen as early in the 1st trimester. But it is more pronounced in the later part of pregnancy. Increased serum Tg concentration are also associated with an increase in thyroid volume.
- 3) Thyroid auto-antibodies (antiTg & antiTPO) are present in 6-19.6% of pregnant women as compared to 5% of non-pregnant women.
- 4) The following is a general overview regarding the physiological and thyroid function tests changes associated with pregnancy:

Physiological Changes	Thyroid Function Test Change
Increased Serum estrogens	Increased Serum TBG
Increased Serum TBG	(i) Increased demand for T4 and T3 (ii) Increased in total T4 and T3
Increased hCG	(i) Decreased TSH (ii) Increased FT4
Increased Iodine clearance	(i) Increased in dietary requirement of iodine (ii) Decrease in hormone production in iodine deficient areas (iii) Increased Goiter in iodine deficient areas.
Increased Type III de-iodinase	(i) Increased T4 and T3 degradation (ii) Increased demand for T4 and T3
Increased Demand for T4 and T4	(i) Increased serum Tg. (ii) Increased thyroid volume (iii) Increased Goiter in iodine deficient areas

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Aarskog Syndrome - A Rare Case Report

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ABSTRACT

Aarskog syndrome is a rare X-linked inherited disorder characterized by short stature, multiple facial, dental, digital and urogenital abnormalities. Here is one such male patient aged 20 years who was short statured and had dysmorphic facies with lack of eruption of multiple permanent teeth. He also had shawl scrotum with low IQ. The clinical appearance was coinciding with most of the features suggested in Aarskog syndrome.

INTRODUCTION

Aarskog syndrome (AAS) is also known as Faciogenital dysplasia (facial-digital-genital syndrome) is an X-linked inherited disorder¹⁻³.

The syndrome is named after Dagfinn Aarskog, a Norwegian pediatrician and human geneticist who first described a condition of familial syndrome of short stature associated with facial dysplasia and congenital anomalies in 1970,^{4, 5} and Charles I. Scott, Jr., an American medical geneticist who independently described the syndrome in 1971⁶. Hence the name Aarskog-Scott syndrome.

Aarskog syndrome is characterized by short stature, multiple facial, musculoskeletal, dental, neurological and urogenital abnormalities, ocular manifestations, congenital heart defects,⁷ low IQ and behavioral problems². Usually the dental findings include hypodontia and retarded dental eruption⁸.

The gene responsible is FGD1³ (MIM#305400) and AAS has been ascribed to mutations in the FGD1 gene⁹.

CASE REPORT

A 20 year old male patient was referred from a private clinic to the Department of Oral Medicine and Radiology, Bapuji Dental College and Hospital who desired to get his missing front teeth to be replaced. Upon eliciting history, it was found that his upper and lower front deciduous and permanent teeth were not erupted and surprisingly he never consulted any doctor for the same before. He had normal developmental milestones. Patient was uneducated and unemployed. There was no history of consanguineous marriage of his parents. His maternal aunt has similar nose as of him and other family members were normal. His sister has all permanent

teeth for her age and is studying.

Upon general physical examination, patient was of short stature (153 cms) with rounded face (Figure 1), broad forehead (Figure 1), hypertelorism (figure 1) (innercanthal distance - 4.6 cms, outercanthal distance - 9.6 cms), low and broad nasal bridge (Figure 1), downward slant of palpebral fissures (Figure 1), small nose (Figure 1), maxillary hypoplasia (figure 1), low and posteriorly set small ears, short neck without webbing, harrison's sulcus, small and short hands and feet, simian crease on the palmar aspect of hand, and also had shawl scrotum. On intra oral examination, there was vestibular bulge in relation to lower anterior labial and lingual vestibule (Figure 2), extending mediolaterally from mesial of 85 to 75 causing complete vestibular obliteration with buccal and lingual cortical plate expansion. There was a shallow arched palate (figure 3). Clinically teeth present were 53,54,55,16,17,64,65,26,27,74,75,36,37,84,46,47 (figure 2, 3). Partially edentulous upper and lower alveolar ridges, with over retained deciduous teeth in relation to 53,54,55,64,65,74,75,84 (figure 2, 3) and missing twenty permanent teeth i.e 11,12,13,14,15,21,22,23,24,25,31,32,33,34,35,41,42,43,44,45 (figure 2, 3). There was mesioocclusal caries in relation to 55 and distoocclusal caries in relation to 54 (figure 3). There was grade II mobility in relation to 54 and 55 with attrition of all over-retained deciduous teeth (figure 2, 3).

Patient was then subjected to radiographic examination, i.e panoramic radiograph, mandibular true occlusal, intraoral periapical radiographs (IOPA), and lateral cephalograph. IOPA in relation to maxillary and mandibular anterior region (figure 4) revealed impacted 11,12,21,22,31,32,33,41,42,43 along with retained root stump in relation to 71. There was no evidence of root resorption in over-retained deciduous teeth in relation to 53, 65, 75 and 85. IOPA of posterior



Fig. 1: Round face, broad forehead, hypertelorism, low and broad nasal bridge, small nose, maxillary hypoplasia.



Fig. 4: Intraoral periapical radiograph in relation to maxillary anterior region revealed impacted 11, 12, 21, and 22.



Fig. 2: Shallow arched palate.

- Teeth present were 53, 54, 55, 16, 17, 64, 65, 26, and 27.
- Missing teeth were 11, 12, 13, 14, 15, 21, 22, 23, 24 and 25.
- Mesioocclusal caries in relation to 55 and distoocclusal caries in relation to 54.

quadrant revealed impacted 18, 24, 25, 28, 38 and 48. Periapical radiolucency was found in relation to 54, 55 and 64. Panoramic radiograph (figure 5) revealed seventeen impacted permanent teeth i.e 13,14,15,18,22,23,24,25,28,31,32,33,38,41,42,43,48. There was cortical plate expansion in the anterior segment in mandibular occlusal radiograph (figure 6). There was non union of coronal suture, thickened cortex superiorly along with maxillary hypoplasia as evidenced in lateral cephaograph (figure 7). Then patient was subjected to IQ evaluation, which was 56 (according to Binet Kamat Test).

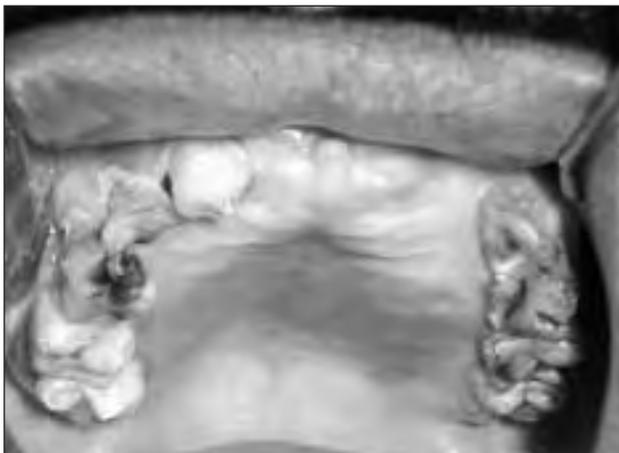


Fig. 3: Vestibular bulge in relation to lower incisor region with edentulous wide mandibular alveolar ridge and teeth present were 74,75,36,37,85,46,47.

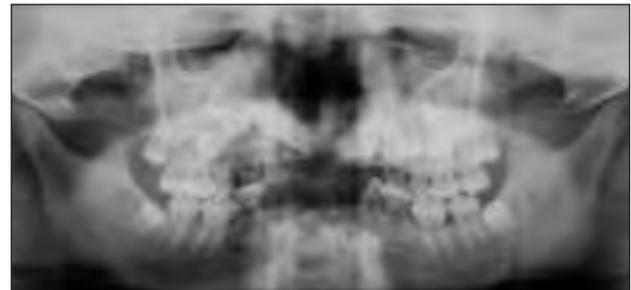


Fig. 5: Panoramic radiograph revealing multiple missing impacted permanent teeth and retained deciduous teeth.

His physical appearance and intraoral findings were closely related to Aarskog syndrome.

Features such as short stature, mental deficiency, low nasal bridge, small nose, hypoplastic maxilla, short



Fig. 6: True mandibular occlusal radiograph revealing wide cortical plate expansion.

and broad hand, hypertelorism, delayed eruption of teeth and hypodontia were found similar to Acrodysostosis but rest of the features like tendency to hold mouth open, prognathism, increased mandibular angle, large great toe, optic atrophy, hypoplastic genitalia, hypogonadism and malocclusion were not found in the present case.

As per the published English literature, the present case satisfies most of the primary and secondary criteria of diagnosis of Aarskog syndrome.⁹ Hence diagnosis of Aarskog syndrome was made.

As patient was keen in replacement of missing teeth, and was not interested, the genetic analysis could not be performed. Further patient was referred to department of oral and maxillofacial surgery, for extraction of multiple impacted teeth under general anesthesia along with prosthetic rehabilitation for missing teeth to be done in the department of prosthodontics.

DISCUSSION

Aarskog-Scott syndrome (AAS) is a genetically heterogeneous developmental disorder⁹. Approximately 200 cases have been reported till date¹⁰. Aarskog syndrome mainly affects males. In affected males, a large variability of expression was observed, while females show minor signs only. However it is sometimes possible to identify individual females as carriers¹¹ with minor dysmorphic features such as hypertelorism and widow's peak.⁹

The diagnosis of Aarskog syndrome is mainly by clinical criteria⁹. The primary criteria include: short stature, hypertelorism, short nose with anteverted nares, maxillary hypoplasia, a crease below the lower lip, mild interdigital webbing with short and broad hands, short fifth finger with clinodactyly, and shawl scrotum. Secondary criteria include: abnormal auricles with fleshy lobules, posteriorly angulated ears,

widow's peak, ptosis, downward slant of palpebral fissures, joint hyperextensibility, broad feet with bulbous toes, cryptorchidism, inguinal hernia, and prominent umbilicus¹². Genital anomalies are characteristic.

Aarskog syndrome diagnosed prenatally by sonography at 28 weeks' gestation in a high-risk pregnancy for this disorder¹³.

The X-linked form of AAS has been ascribed to mutations in the FGD1 gene (faciogenital dysplasia 1 gene). However, although AAS may be considered as a relatively frequent clinical diagnosis, mutations have been established in few patients. Genetic heterogeneity and the clinical overlap with a number of other syndromes might explain this discrepancy⁹.

FGD1 encodes a guanine nucleotide exchange factor that specifically activates the Rho GTPase Cdc42; FGD1 mutations result in Faciogenital Dysplasia (Aarskog syndrome) that adversely affects the formation of multiple skeletal structures.

Porteus et al¹⁵ and Stevenson et al¹⁶ linked the Aarskog gene to Xp11.3-Xq13. Glover et al¹⁷ precisely assigned the breakpoint to Xp11.21 on re-evaluation of the chromosomes in 1993. This localization allowed the cloning of FGD1, the gene responsible for the syndrome¹⁸. FGD1, which encodes a 961 amino acid zinc finger protein with strong homology to the Rho/Rac guanine nucleotide exchange factors (GEF), was shown to be interrupted by the t(X;8) breakpoint. Until now, only one point mutation has been reported in an affected family, consisting of an insertion of an additional guanine residue at nucleotide 2122 of exon, which causes premature translational termination^{18,9}.

Recently studies have been conducted to look for mutations in FGD1 gene, and it was confirmed that only a minority of these patients who are clinically diagnosed as Aarskog syndrome, carries the mutation in the FGD1 gene.¹³

The major facial manifestations of this syndrome include hypertelorism, broad forehead, broad nasal bridge, short nose with anteverted nostrils, long philtrum, widow's peak hair anomaly, and ocular and ear anomalies. In our case also the patient had short stature, with rounded face, broad forehead, hypertelorism (innercanthal distance - 4.6 cms, outercanthal distance - 9.6 cms), low and broad nasal bridge, downward slant of palpebral fissures, small nose, maxillary hypoplasia, low and posteriorly set small ears, short neck without webbing.

Limb abnormalities consist of short broad hands, brachydactyly, interdigital webbing, hypoplasia of the

middle phalanges, proximal interphalangeal joint laxity with concomitant flexion and restriction of movement of distal interphalangeal joints, and flat broad feet with bulbous toes. Our patient had simian crease on the palmar aspect of hand, small and short hands and feet.

Genital anomalies are characteristics and include shawl scrotum, cryptorchidism, and inguinal hernia¹³ Shawl scrotum is the genital abnormality in our patient.

However there was no widow's peak, anteverted nose, crease below the lower lip, interdigital webbing, clinodactyly, bulbous toes, cryptorchidism, inguinal hernia, prominent umbilicus. Harrison's sulcus was evident in our case.

Although ophthalmic manifestations are noted rarely, findings may include optic nerve hypoplasia, retinal vessel tortuosity, deficient ocular elevation, hyperopia, and anisometropia.¹ Pulmonary stenosis and ventricular septal defect with spontaneous closure were detected in patients with this syndrome. The authors have insisted that in all cases of Aarskog syndrome a cardiac evaluation is indicated.⁷ In our case there were neither ophthalmic nor cardiac manifestations on evaluation.

Dental manifestations of the Aarskog syndrome were studied, and it revealed that there were retarded development and eruption of the permanent teeth. Dental age was less retarded than height age and bone age. The prevalence of hypodontia and the prevalence and degree of orthodontic anomalies were higher than in the general population. Caries prevalence was high.²⁰ In present case, there were 20 missing permanent teeth among that 17 teeth were impacted in jaw bone.

Some authors have noted mild neurodevelopmental delay in up to 30% of the cases.¹³ Our patient's IQ was low i.e 56 (Binet Kamat Test). A study conducted by Fryns JP, revealed that the AAS individuals with mental impairment are mildly affected, with learning and behavioural disabilities often confirmed to early childhood. The majority of these children have a good evolution into adulthood and the changing phenotype with age includes an age related improvement of mental status.²¹

Surgery may be required to correct some of the anomalies, and orthodontic treatment²² may be used to correct some of the dental abnormalities. Trials of growth hormone have not been effective to treat short stature in this disorder.

CONCLUSION

Aarskog syndrome is a rare syndrome with a typical triad of facial, digital and genital characteristics. Patient will also have maxillary hypoplasia, dental anomalies as hypodontia, delay in eruption or lack of eruption of permanent teeth. Though the occurrence of this syndrome is rare, and the diagnosis is mainly by characteristic clinical appearance. Study for the mutation of FGD1 gene confirms the diagnosis.

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Stem Cell Therapy and Tooth Regeneration - A Review

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ABSTRACT

Tooth development results from sequential and reciprocal interactions between the oral epithelium and the underlying neural crest derived mesenchyme. The generation of dental structures and / or entire teeth in the laboratory depends upon the manipulation of stem cells and requires a synergy of all cellular and molecular events that finally lead to the formation of tooth specific hard tissues, dentin and enamel. The odontogenic potential resides in the oral epithelium and thus epithelial stem cells are necessary for both the initiation of tooth formation and enamel matrix production. This review focuses on the re-growth of teeth in vitro and their relative efficiency by using stem cells from different sources.

Key words: Stem cells, Odontoblast, Dentin, Ameloblasts Enamel, Tooth, Incisor, Human.

INTRODUCTION

According to the U.S. Department of Health and Human Services, the average American will lose about eight teeth by the time he or she turns 50. Common replacements include dentures which have been known to erode the underlying bone over time, and dental implants, which are prone to falling out after several years use. Thus the ability to re-grow a natural tooth, with the accompanying bone, root and nerves, could provide a significantly healthier alternative for many.

STEM CELLS

A stem cell is defined as a cell that can continuously produce unaltered daughters and, further more, has the ability to generate cells with different and more restricted properties. Stem cells are distinguished from other cell types by two important characteristics. First, they are unspecialized cells capable of renewing themselves through cell division, sometimes after long periods of inactivity. Second, under certain physiologic or experimental conditions, they can be induced to become tissue or organ specific cells with special functions. The capacity to expand stem cells in culture is an indispensable step for regenerative medicine, and a considerable effort has been made to evaluate the consequences of the cultivation on stem cell behaviour.

Stem Cell Sources for the Development of Teeth in Vitro or Ex Vivo

As tooth formation results from epithelial - mesenchymal interactions, two different populations of stem cells have to be considered: epithelial stem cells which will give rise to ameloblasts and mesenchymal stem cells that will form the odontoblasts,

cementoblasts, osteoblasts and fibroblasts of the periodontal ligament. Thus, tooth engineering using stem cells is based on their isolation, association and culture as recombinants in vitro or ex vivo conditions to assess firstly tooth morphogenesis and secondly, cell differentiations into tooth specific cells that will form dentin, enamel, cementum and alveolar bone.

Sources of stem, cells are human exfoliated deciduous teeth, adult dental pulp stem cells, stem cells from the apical part of the papilla, from dental follicle, periodontal ligament stem cell and bone marrow derived mesenchymal stem cells.

STEM CELLS FROM HUMAN EXFOLIATED

Deciduous Teeth (SHED)

Recent findings demonstrated the isolation of mesenchymal progenitors from the pulp of human deciduous incisors (Miura et al, 2003) which exhibited a high plasticity since they could differentiate into neurons, adipocytes, osteoblasts and odontoblasts (Miura et al, 2003). In vivo SHED cells can induce bone or dentin formation but, in contrast to dental pulp, DPSC failed to produce a dentin pulp complex.

Adult Dental Pulp Stem Cels (DPSC)

After a dental injury dental pulp is involved in a process called reparative dentinogenesis, where cells elaborate and deposit a new dentin matrix for the repair of the injured site (Mitsiadis and Rahiotis, 2004). It has been shown that adult dental pulp contains precursors capable of forming odontoblasts under appropriate signals (Miura et al. 2003; Tecles et al. 2005). Among these signals are the calcium hydroxide or calcium phosphate materials used by dentists for

common dental treatments. Tooth repair is a lifetime process thus suggesting that MSC might exist in adult dental pulp.

Stem Cells from the Apical Part of the Papilla (SCAP)

Stem cells from the apical part of the human dental papilla (SCAP) have been isolated and seen to exhibit a higher proliferative rate than PDLSC for tooth formation. Importantly, SCAP are easily accessible since they can be isolated from human third molars.

Stem Cells from the Dental Follicle (DFSC)

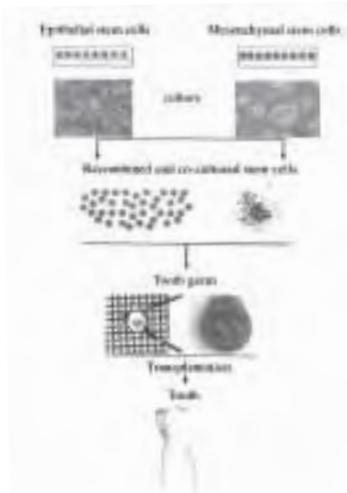
DFSC have been isolated from follicle of human third molars and these can differentiate into cementoblasts in vitro and are able to form cementum in vivo. (Handa et al, 2002) Immortalized dental follicle cells are able to re-create a new periodontal ligament (PDL) after in vivo implantation (Yokoi et al, 2007).

Periodontal Ligament Stem Cells (PDLSC)

The PDL is a specialized tissue located between the cementum and the alveolar bone and it's continuous regeneration is thought to involve mesenchymal progenitors arising from the dental follicle. PDL contains STRO-1 positive cells that maintain certain plasticity since they can adopt adipogenic, osteogenic and chondrogenic phenotypes in vitro (Gay et al 2007). It is thus obvious that PDL itself contains progenitors, which can be activated to self-renew and regenerate other tissues such as cementum and alveolar bone (Seo et al. 2004).

Bone Marrow Derived Mesenchymal Stem Cells (BMSC)

BMSC have been tested for their ability to recreate periodontal tissue. These cells are able to form in vivo cementum, PDL and alveolar bone after implantation into defective periodontal tissues.

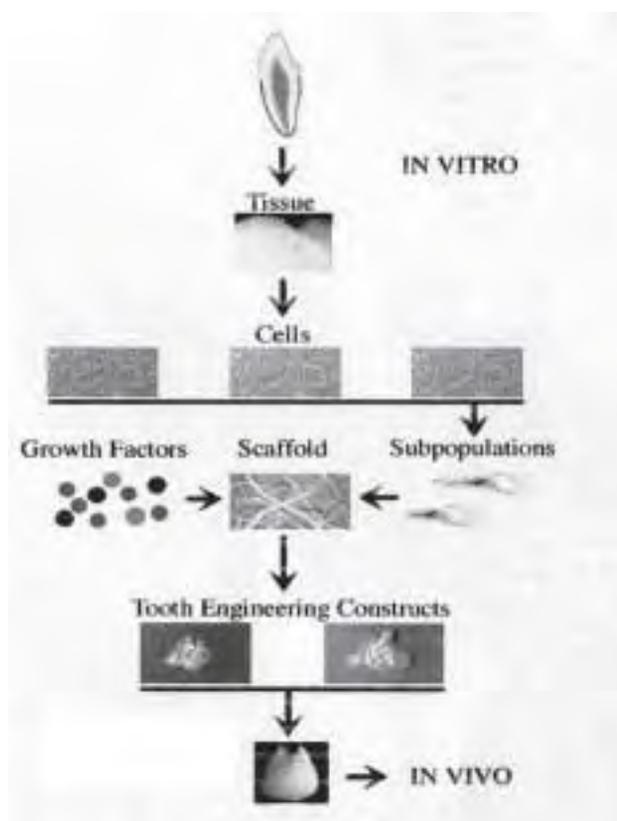


Use of stem cells for tooth formation in vitro and ex vivo. A tooth germ can be created in vitro after co-culture of isolated epithelial and mesenchymal stem cells. This germ could be implanted into the alveolar bone and finally develop into a fully functional tooth.

Diagram 1: Use of stem cells for tooth formation in vitro and ex vivo

Association of Epithelial and Mesenchymal Stem Cells

Since teeth are formed from two different tissues, building a tooth logically requires the association of odontogenic mesenchymal and epithelial cells. Numerous attempts have been made in order to form teeth in vivo with very promising results. Single cell suspensions obtained from rat, pig or mice tooth germ have been seeded on to the surface of selected biomaterials (e.g. collagen coated polyglycolic acid, calcium phosphate material, collagen sponges) and successfully reimplanted into the omentum of immunocompromised animals (Duailibietal 2004; Honda et al. 2006, 2007 a, Huet al 2006, Robey, 2005, Young et al, 2002). All these reports describe the presence of both dentin and enamel. This indicates that the recombined cells could re-organize themselves and form individual layers and further more, that they can differentiate properly into odontoblasts and ameloblasts.



Construction of a bioengineered tooth. The association of tooth-derived stem cells with defined scaffolds in the presence of growth factors allows the creation of tooth specific constructs such as crown and root of missing parts of an injured tooth. These biological constructs could be used in dental clinics as substitutes for metal implants, crowns and restorative dental materials.

Diagram 2: Construction of a bioengineered tooth.

Recently a new approach has been proposed for growing teeth in the mouse mandible (Nakao et al

2007). In this study, epithelial and mesenchymal cells were sequentially seeded into a collagen gel drop and then implanted into the tooth cavity of adult mice. With this technique the presence of all dental structures such as odontoblasts, ameloblasts, dental pulp, blood vessels, crown, periodontal ligament, root and alveolar bone could be observed. (Nakao et al 2007). This indicates that stem cells could be used in the future for the replacement of missing teeth in humans.

CONCLUSION

Thus we can conclude that the identification of several types of epithelial and mesenchymal stem cells in the tooth and the knowledge of molecules involved in stem cell fate is a significant achievement.

The development of biological approaches for dental reconstruction using stem cells is promising and remains one of the greatest challenges in the dental field for the years to come.

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Learning Style Preferences & Course Performance of Phase I MBBS Students

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ABSTRACT

Instructional methods in medical education are largely teacher centered rather than being student centered & not much attention is being given to the learning preferences of student. The present study was conducted to determine the relationship between Visual, Aural, Read/Write, Kinesthetic (VARK), sensory modality tool and course performance in the subject of physiology

Key words: Learning style, Learning preferences, VARK, Active learning

INTRODUCTION

Learning style has been described as a strategy that student adopts to a learning situation¹. Learning preference is composite of the ways in which we learn best as individuals². Learning styles are defined as the composite of characteristic cognitive, affective and physiological characters that serve as relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment³. The ways we learn new information can be categorized according to our specific learning styles⁴. Which are classified according to the sensory modality that one most prefers to use when internalizing information. The four major sensory modalities are visual, aural, read /write and kinesthetic⁵. Some learners have preferences for one of these learning modalities, whereas multimodal learners learn via two or more of the modalities³. Teaching by taking into account the student's preferences can seem complex but there have been a number of studies that support the idea, that teaching process using learning preferences can influence learning and academic success of such students is noteworthy⁴. Thus teaching in the areas of strength encourages more elaborate and diverse encoding of material than does learning in less preferred mode². It may also be helpful in planning teaching sessions and develop effective curricular approaches and for processing information¹. The idea of individualized learning styles originated in 1970s⁶. However with an emergence of numerous learning style models over the past 25 years; it has brought increasing attention of to the idea that, students learn in diverse ways and that one approach to teaching does not work for every student or even most of the students⁷.

A substantial number of medical students have preference for several learning styles, yet medical faculties teach overwhelmingly in a single mode⁸. For medical instructors it is important to assess and teach knowledge, attitudes and skills to meet the educational needs of the student by accommodating other learning modalities³. In order to facilitate student learning with new self directed approaches, numerous learning style inventories have been reported⁷. which are predicted upon information processing models that essentially aim to describe an individual's preferred intellectual approach to assimilate information by using four different sensory modalities³. Among the various tools used to determine learning preferences Visual, Aural, Read/write & Kinesthetic, VARK is one such tool which categorizes learning preferences based on sensory modalities, that is students preferring visual modality enjoys seeing graphics, diagrams, pictures. Auditory learners prefer listening, interacting, discussing while, read/write learners learn best with textual content such as reading books, text based handouts and kinesthetic learners internalize information when involved physically (touching and manipulating materials⁴. This instrument provides the users with simple profile of basic sensory learning and can be used as a guide to instructors in their selection of learning and assessment strategies³.

The transition from twelfth standard to first year medical education can be difficult for students because of dramatic increase in the volume of contents and today's medical students represent a broad spectrum in terms of age, experience, culture, ethnicity and level of preparedness, which presents a challenge for instructors to meet the educational needs of all students⁹. Most of the studies have found^{3,4,5}. That

majority of the students had multimodal preferences while learning information but the studies incorporating relationship between preferred learning style and course performance appears meager. Therefore this study was undertaken to determine the preferred learning styles using VARK and a questionnaire covering VARK domains for course performance. In the course of this study observations were made about student's preferences in their use of conditions for learning.

MATERIALS AND METHODS

A total of 100 first year medical students with mean age of 20.5 years admitted during the academic year 2009-2010 were enrolled in this study. The institutional ethical clearance was obtained. The objectives of the study were explained and consent was taken. A general questionnaire was used to obtain the name, age, gender, nationality, and VARK questionnaire tool was used to determine different sensory modality learning preferences¹⁰. This VARK tool is a simple sixteen question survey. It offers both students and instructors, a method to enhance students learning by understanding the preferred modes⁸. A simple questionnaire covering domains of VARK questionnaire was included for physiology course. The students were asked to self assess their course learning style preferences by selecting the following statements which were coded as 1) V- Seeing text or diagrams helps to take new information (Visual). 2) A- hearing the material helps to take new information (Auditory). 3) R- reading/writing down what is heard (Read/write). 4) K-touching or observing a physical model helps to take new information (Kinesthetic). The course included a variety of diverse teaching resources to ensure that multiple sensory modalities were being used to help for presenting the information; for example the lecture portion of the class incorporated resources like Power Point slides, a text book, portable document format (PDF) lecture notes, animations and chalkboard drawings as well as question and answer sessions and a laboratory component were included, as indicated in Table 1. Completed questionnaires were collected at the end of the subsequent lecture and practical. Thus obtained questionnaires from students were scored.

Table 1. Course Resource and VARK modalities covered

Course resource	VARK domain covered
Lecture instructor	Aural
Lecture presentation	Visual
Laboratory equipments	Kinesthetic

Conversely because this study sought to focus on border relationship between preferred sensory modality and course performance, a simple and direct

questionnaire was used to internalize the information that covered the VARK Domain.

Statistical Analysis: Data expressed in mean ± standard deviation and percentages. Data (reported as percentages) were obtained by dividing the number of students by total number of respondent

RESULT

Of the 100 students participated in the study, 60 students were male, 82 Indians, 16 Malaysians and two were of other nationality. Majority of the students were educated in English Medium schools. The demographic characteristics of the respondents are shown in Table 2. The data obtained from the VARK tool showed that majority of the students had multimodal learning preferences (67%) and remaining 33% had single preference (Figure 1). The percentages of the students preferring a single mode in the descending order were read-write 12.2%, auditory 9.2%, visual 7.6% and kinesthetic 3.8%. The corresponding mean scores of the same has been represented in Table 3 indicating higher preference for read/write followed by auditory, visual and least for kinesthetic. Comparison of the VARK result scores for single mode preference with course performance showed significant (p<0.05) correlation with the most common learning preference preferred by the students being read/write (12.4% and 45%) and least being kinesthetic for both the results. (Table 4)

Table 2. Demographic characteristics

Characteristics	Number of participants	Percentage
Sex Male	60	60%
Female	40	40%
Ethnicity Indians	82	82%
Malaysians	16	16%
Others	02	2%

Table 3. VARK Scores for different sensory modality

Variables	Mean	Standard deviation
Visual	5.80	2.37
Auditory	6.10	2.29
Read / Write	6.70	55.00
Kinesthetic	3.00	0.22

Table 4. Comparison of the percentages of VARK Scores with course performance score

Variables	VARK results	VARK Scores
Visual	7.60%	19%
Auditory	9.20%	23%
Read / Write	12.40%	45%*
Kinesthetic	3.80%	13%

*Statistically significant (p<0.05)

OBSERVATION

Comparison of the VARK result scores for single mode preference with course performance showed significant co-relation, with the most common learning preference preferred by the students being read/write and least being kinesthetic for both course preference & performance.

Rationale of this study is to help for designing lesson plans based on student preferences and also for further research. Awareness of student's preferences will be of great value in designing course delivery strategies like active learning.

DISCUSSION

The quantity and quality of learning is determined by the learning approach that the students adopts, which plays an important role in determining the outcome of any educational endeavor¹¹. In order to provide efficient and effective education it is essential that teachers understand their students as learners¹². The knowledge of learning preferences may help educators to facilitate student learning and to bridge the academic gap, there is a need to blend old didactic methods with new self directed approaches². In the present study there was no association between gender and preferred learning styles which is not in accordance with the previous studies^{1,3}. A greater percentage (67%) students exhibited multimodal preference indicating they preferred information by a variety of modes. These findings are comparable with earlier studies^{3,4,5}. Thus it can be emphasized that most of the students may benefit from active learning strategies. These active learning strategies reach all types of learners, promote thinking through reasoning and improve problem solving and decision making³. Such activities may promote group work and generate high levels of motivation and enthusiasm.

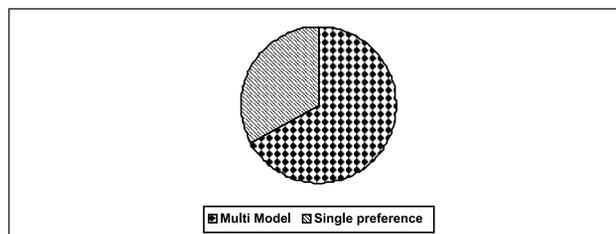
Of the single preferred styles, there was a significant relationship between the preferred VARK sensory modality and course performance for Read/write preferred mode. The result was not in parallel to earlier study⁵. which showed auditory sensory modality as the most common preferred mode of learning. Most of the resources for completing the course has visual component, however majority of the students (45%) preferred the lecture material in the form of reading/writing, followed by auditory (23%) as the most helpful resource for completing the lecture portion of the course. Least percentage of students (13%) were Kinesthetic learners indicating that this component of the course may need to be strengthened.

Therefore the results of the present study indicate that students have different learning modes and

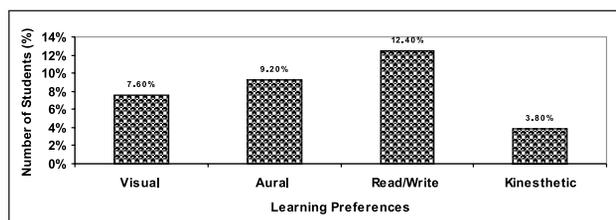
knowing their learning preferences may help the medical instructors to develop appropriate learning approaches and explore opportunities so that they will be able to make the educational experience more productive.

CONCLUSION

The rationale of this study was to help to design a lesson plan. Main conclusion was a significant association between preferred sensory modality and course scores. In a passive lecture format all students are assumed to be auditory learners although in present study most of the students emphasized on read/write sensory modality. Therefore learning style preferences may change over the time and with different levels of education. If the faculty is aware of student learning and lecturing preferences, then course activities including avenues to provide additional assistance can be tailored to best fit these preferences. A wide variety of teaching method can help to cater the diversity of students and restructure the instructional methods.



Graph 1: Overall Learning style preferences of physiology students



Graph 2: Student with single mode preferences (n=33)

Future studies can be looked into whether multimodal learners perform better in the class room than the single mode learners or how well do grading system correlate with learning preferences.

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Intubation in Maxillofacial Trauma-A Dilemma

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ABSTRACT

Complex midfacial or panfacial injuries often require tracheostomy to ensure a free operative field. Oral intubation can interfere with assessment of occlusion and nasal tracheal intubation may lead to complications (brain damage, leakage of cerebrospinal fluid, and meningitis) when there are also fractures of the base of the skull. On the other hand, tracheostomy is associated with complications such as haemorrhage, pneumomediastinum or pneumothorax, injury to the recurrent laryngeal nerve, and tracheal stenosis and should be reserved for severely injured patients who need protracted assistance with ventilation or further operations. A useful alternative method of managing the airway intraoperatively are by submental endotracheal intubation and retromolar intubation. Submental intubation allows tracheal intubation by passing the tube through a submental skin incision into the mouth. Retromolar intubation is a non-invasive technique and avoids both submental tracheal intubation and tracheostomy in the majority of patients. In this paper two cases of maxillofacial injury, operated one using submental technique and another with retromolar intubation are reported.

Key words: Submental intubation, Retromolar intubation, Maxillofacial trauma, Anesthetic techniques, Inter maxillary fixation.

INTRODUCTION

Patients with maxillofacial trauma present unique airway management challenges in the emergent, operative and postoperative settings. Airway management during surgical treatment of patients with maxillofacial trauma is complicated by injury to route of intubation. Oral route endotracheal intubation may prevent the intraoperative inter maxillary fixation. Nasotracheal intubation is not suitable in nasal fractures and in skull base fracture cases. The use of alternative intubation methods such as tracheostomy, cricothyrotomy can be avoided due to the high rate of morbidity, aesthetic and functional compromise¹⁻³.

In such circumstances submental intubation and retromolar technique are alternative. In this paper two cases of maxillofacial injury, one was operated under submental intubation and another case using retromolar technique are reported. The submental intubation technique was widely recommended for midfacial trauma cases when short-term intermaxillary fixation was needed⁴⁻⁶. Submental technique has been advocated as a simple way to avoid to nasotracheal

intubation as well as interference to occlusion⁷.

CASE REPORTS

Case 1: A 38 years-old male patient with lefort II and mandibular left body fracture following road traffic accident reported to our unit. Treatment plan of open reduction and internal fixation was decided. In this case nasal intubation could not be done because of lefort II fracture and oral intubation was not preferred as it required intraoperative intermaxillary fixation. Other options were retromolar or submental intubation or tracheostomy. There was insufficient space distal to third molar and tracheostomy was more invasive procedure hence, submental intubation was technique of choice in this case.

Procedure: After standard orotracheal intubation, temporary draping of the mouth and chin region was carried out (Figure 1). 2 cm Skin incision was placed in the submental, paramedian region, directly adjacent to the lower border of the mandible (Figure 2). The muscular layers which include platysma and mylohyoid were traversed using curved artery forceps that were always in contact with the lingual cortex of the mandible (Figure 3). The mucosal layer in the floor of the mouth was incised over the distal end of the forceps, located in front of the sublingual caruncle and the forceps were then opened creating a Tunnel (Figure 4). The tube along with the cuff passed through the Tunnel with the forceps after disconnection from

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the ventilator and the connection tube (Figure 5). After the tube was positioned the connection tube was restored and the circuit was re-established and secured with suture (Figure 6). At the end of the surgery the tube was disconnected, pulled back into the oral cavity and reconnected. Extraorally the wound was sutured and the patients were extubated.



Fig.1: Drapping of patient after oral intubation



Fig. 2: Incision in submental region



Fig. 3: Blunt dissection of muscular layers of platysma and mylohyoid using curved artery forceps



Fig. 4: Tunnel created following incision of oral mucosa



Fig. 5: Tube passed through tunnel



Fig. 6: Tube secured in place with suture

CASE 2

48 year old male patient with lefort I and

mandibular right parasymphysis fracture following road traffic accident reported to our trauma centre. Treatment plan of open reduction and internal fixation was decided. In this case nasal intubation was avoided because of lefort I fracture and retromolar intubation was feasible as space distal to last molar to pass the tube was present. Oral intubation was not possible as it intermaxillary fixation was needed intraoperatively. Other options were submental intubation or tracheostomy. Submental and tracheostomy were more invasive procedure hence, retromolar technique which was simple was decided. First, orotracheal intubation was performed with a flexometallic tracheal tube. (Figure 7) The orotracheal tube was then placed in the retromolar space distal to the last erupted molar teeth. Intubation is secured in place (Figure 8). Intermaxillary fixation done with no interference from tube (Figure 9)



Fig. 7: orotracheal intubation was performed



Fig. 8: Intubation is secured in place

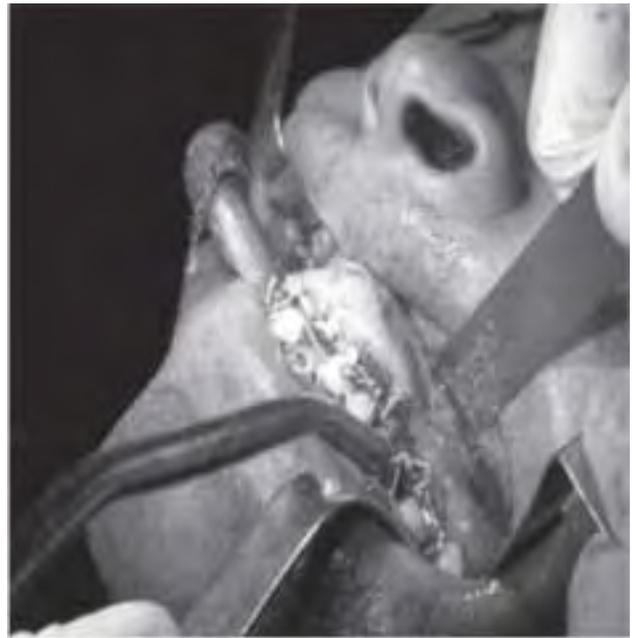


Fig.9: Intermaxillary fixation done with no interference from tube

DISCUSSION

An often stated reason for avoidance of nasotracheal intubation in maxillary trauma patient is the danger of accidental passage of tracheal tube into cranial cavity⁸. Submental endotracheal intubation was described by Hernandez Altemir in 1986⁹. It is a simple surgical technique with very low morbidity and can replace tracheostomy in selected cases of maxillofacial trauma where nasal and oral intubation not feasible. Retromolar is non invasive technique, could be used when space posterior to third molar is sufficient. Another traditional method for securing the airway in such situations is tracheostomy where intermaxillary fixation could be done intraoperatively. It is preferred when post operative ventilation is required. It is claimed that submental technique may be safely used for elective ventilation for periods upto ten days¹⁰.

Submental technique is technically easier, less time consuming and accompanied by lower morbidity than tracheostomy¹¹. Different technique of submental intubation according to the site of incision has been described. Stoll and colleagues suggested a more posterior approach, in the submandibular area without complications¹⁰. Laryngeal mask airway in the submental route can be performed¹².

The original Altemir's technique has been modified by several authors. The modifications include the use of endotracheal tubes either the midline¹³⁻¹⁵ or submandibular¹⁴ approach instead of the latero-submental approach. Based on our experience, we do not see any merit in these modifications. The

midline approach can traumatize the Wharton's ducts, interferes with attachment of the genioglossus and geniohyoid muscles, and snug placement of the tube to the paralingual groove might also be compromised. Injury to the mandibular lingual perforating vessels, which are present in the midline in 98% of instances, could lead to bleeding¹⁶. In our case tube was passed extraperiosteally with the standard submental approach lateral to midline. The intubation never interfered with intraoral manipulation during reduction of fracture fragments and interdental occlusion could be easily checked. There was no inflammation, poor scar formation or bleeding at the intubation site in our case. The wound healing was uneventful. The patient accepted the remaining small submental scar.

Retromolar technique is ideal when adequate space distal to last molar is present. It does not need additional surgical procedure and intermaxillary fixation can be done¹⁷. In case of inadequate space distal to last molar, a semilunar osteotomy is made in retromolar area to gain adequate space¹⁸. In our patient we had sufficient space for tube placement. In our experience submental intubation should be advocated only when adequate space distal to last molar without additional surgical procedure. Some surgeons found oral tube awkward and risk of dislodgment during surgery with this technique. In our patient, tube was well secured at corner of mouth and did not have any difficulty during surgery¹⁸.

CONCLUSION

Intubation of any form performed in a maxillofacial trauma patient is complex and requires both sound judgment and considerable experience. Good communication is always required between surgeon and anesthesiologist choosing appropriate intubation technique. According to literature reports and our own experience, these two techniques are simple, quick, safe and acceptable alternative to replace tracheostomy in selected cases of maxillofacial trauma which requires intermaxillary fixation. We prefer retromolar technique and when insufficient space distal to last molar is there, submental technique.

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Lingual Orthodontics: The Invisible Braces

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ABSTRACT

The history of lingual orthodontics has not been a smooth one. We are now in a period of resurgence; the technique has become more sophisticated. The clinical results achieved can stand on an equal footing with the best of conventional labial techniques, and the acceptance of technique by the profession is growing rapidly. This article gives a brief overview of the history, indication/ contraindications, procedure and advantages/ disadvantages in lingual orthodontics.

INTRODUCTION

Lingual orthodontics or invisible braces is an efficient, legitimate treatment modality that should be part of the armamentarium of any modern, caring, comprehensive orthodontic practice. Lingual orthodontics has now come of age; its acceptance by both the profession and the patient population continues to grow internationally. The future of lingual orthodontics is dependent on the following three important issues:

- (1) Advances in technology related to appliance design and laboratory protocols.
- (2) Demographic changes in population age groups—the growth in the number of adult patients seeking orthodontic treatment associated with an increase in affluence and disposable income is creating a patient-driven demand for more esthetically acceptable appliances; and
- (3) Attitudinal changes of orthodontists.

Lingual orthodontics has come a long way, as we understand it today it is a full, multibracket appliance, which was introduced in the 1970s. Curiously, the lingual appliance was not the consequence of an esthetic demand, but it was started in Japan by Kinja Fujita to satisfy the orthodontic needs of patients who

practiced martial arts, to protect the soft tissues (lips and cheeks) from the possible impact against brackets.

Fujita was the first to develop the lingual multibracket technique using the mushroom shaped archwire. He submitted his concepts on lingual orthodontics in 1967, began his research in 1971, and published the Fujita method in 1978, treating Class I and Class II cases with extraction of four bicuspids.

Later, Craven Kurz started his investigations with Jim Mulick in 1975 (UCLA School of Dentistry), using plastic brackets bonded to the lingual tooth surfaces. Apparently an employee of the Bunny Playboy Club with crowded teeth came to Craven Kurz's office asking him for nonvisible orthodontic treatment, further stimulating his interest in the subject. Using plastic brackets, it was easy to reshape them for a better fit to the lingual surface. However there were many problems regarding bond failure and patient discomfort which led to the design of newer brackets.

LINGUAL BRACKETS: EVOLUTION

Generation 1: 1976

This appliance had a flat maxillary occlusal bite plane from canine to canine. The lower incisor and premolar brackets were low profile and half round, and there were no hooks on any brackets.

Generation 2: 1980

Hooks were added to all canine brackets.

Generation 3: 1981

Hooks were added to all anterior and premolar

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brackets. The first molar had a bracket with an internal hook. The second molar had a terminal sheath without a hook but had a terminal recess for elastic traction.

Generation 4: 1982-84

Low profile anterior inclined plane added on the central and lateral incisor brackets.

Generation 5: 1985-86

The anterior inclined plane became more pronounced, with an increased in labial torque in the maxillary anterior region. The canine also had an inclined plane; however it was bibeveled to allow intercuspation of maxillary cusp with the embrasure between the mandibular canine and the first premolar.

Generation 6: 1987-90

The inclined plane on the maxillary anterior became squarer in shape.

Hooks on anteriors and premolars were elongated. A hinge cap, allowing ease of archwire manipulation, was now available for molar brackets.

Generation 7: 1990-PRESENT

The maxillary inclined plane is now heart shaped with short hooks. The lower anterior brackets have a large inclined plane with short hooks. The premolar brackets were widened mesiodistally and the hooks were shortened. The increased width of the premolar brackets allows better angulation and rotation control. The molar brackets now come with either a hinge cap or a terminal sheath.

The majority of malocclusions can be treated with lingual orthodontics, but certain cases are more amenable than others.

INDICATIONS

- In patients where esthetics is of prime concern.
- Cases with mild incisor crowding and with anterior deep bite.
- Long and uniform lingual tooth surfaces without Fillings, Crowns, or bridge.
- Keen, compliant patient with good gingival and periodontal health
- Patients who are able to adequately open their Mouths and extend their neck.

CONTRAINDICATIONS

- Short, abraded, and irregular lingual tooth surfaces

- Presence of multiple crowns, bridges, and large restorations
- Patients with a low level of compliance and poor oral hygiene.
- Patients with limited ability to open the mouth (trismus)
- Patients with cervical ankylosis or other neck injuries that prevent neck extension.

LABORATORY PROCEDURE

The indirect bonding laboratory procedure is often cited as major disincentive for orthodontists planning to start treating cases with the lingual technique. It is a procedure that takes the bracket positioning control out of the orthodontist's hands. Few of the laboratory procedure have been explained here.

Custom Lingual Appliance Setup Service (CLASS System).

CLASS system procedure begins with the duplication of the malocclusion model to produce a set-up model where the teeth have been cut and correctly repositioned and aligned. On this model the brackets are accurately positioned. A flat metal plate helps positioning of the anterior brackets and a separate posterior device is used to position the posterior brackets. The brackets are then transferred back to the malocclusion model by using the cap Technique, where a strip of acrylic covers the incisal edge of the tooth and overlaps onto the top of the bracket, making them one unit. This unit is then separated from the set-up and transferred to the malocclusion model. Advantages of the CLASS system include the visualization of the final occlusion on the articulated set-up model showing possible premature contacts and residual spaces that may occur following space closure in extraction cases.

Torque Angulation Reference Guide (TARG) System

The TARG machine was launched by the Ormco Society in 1984 as an important aid to the laboratory technique. It allows the accurate placement of the brackets at a precise distance from the incisal and occlusal surfaces of the teeth, as well as making it possible to prescribe the torque and angulation for each tooth individually. This creates a "virtual" set-up, and the brackets can be bonded on the malocclusion model, with each bracket having a specific resin-modified base. As the TARG machine does not take into consideration the different thickness of the teeth, many second order archwire bends must be made routinely during treatment.

Bonding with Equal Specific Thickness (BEST) System

In 1986, Fillion added certain important feature which were missing from the original TARG machine—a device to measure the distance in the horizontal plane from the labial surface of the tooth to the slot of the lingual bracket. He added a precise measuring device to the original TARG machine to allow compensation for the different thickness between the teeth. This equipment was later called the Electronic TARG. Positioning the bracket so as to allow for compensation for the different Labiolingual thickness of the teeth facilitated the use of straight wire principles for both anterior and posterior teeth, thus reducing the need for second and third order bends during the treatment. The brackets are bonded directly on the malocclusion model; no set-up model is required. From the information collected during the bracket positioning (torque, angulation, height, and thickness), a special computer software package was developed to trace the ideal archwire for each individual patient. This computer-generated archwire tracing was called DALI (dessin de l'arch linguale informatise) and its main advantage is that there is no need to clinically coordinate upper and lower arches at the chair side, as the computer will have already done this procedure for the clinician.

BONDING PROCEDURE

Bonding on the lingual surface is preferably done by indirect bonding because

1. Variation in lingual tooth morphology creating the need for custom measurement
2. Practitioner's lack of familiarity with lingual tooth morphology.
3. Difficulty in obtaining direct line of sight for bonding.
4. Increased accuracy in bracket placement is required because compensating lingual arch wire bends are more difficult and time consuming.



SURFACE PREPARATION

- Large cingulae or rudimentary cusp should be reduced prior to taking impression.

- Unusual concave lingual surface (e.g. spoon shaped incisor) should filled using acid etch composite build up.
- Porcelain crowns with metal coping should be replaced with plastic crowns.
- Existing amalgam restoration should be removed and tooth should be restored with composite materials.

IMPRESSION

Impression should be taken using alginate or rubber based impression materials.

Accurate impression of the teeth and palate should be obtained (reproducing all the lingual surfaces with clear definition of the gingival crest).

PREBONDING PROCEDURE

A cast is fabricated from the impression taken and the brackets are bonded to the lingual surface of the teeth. Before beginning the bonding procedure the indirect tray which is fabricated using a low viscosity silicone to encapsulate the brackets is tried in to ensure complete seating on the arch.

INDIRECT BONDING

1. Maxillary teeth are etched for 60 seconds and then rinsed using a full air water spray.
2. The etched teeth are then completely dried.
3. A thin coat of the bonding sealant is applied too all-maxillary teeth to be bonded.
4. Adhesive is mixed and applied to the mesh of the brackets in the indirect tray using a syringe.
5. Slightly more adhesive is added on the teeth with concave lingual surfaces.
6. The tray is then inspected and seated on the prepared arch and held with a light pressure for 3 minutes.
7. After 10 minutes the tray is removed the brackets are inspected.
8. A carbide bur is then used to remove excess adhesive.
9. Same procedure is done for the mandibular arch.

ADVANTAGES/BENEFITS

1. Lingual placement of brackets reduces the unsightly decalcification marks, which are produced by chemical insults (etchant materials and plaque accumulation) on the labial surface. Thus playing an important esthetic role.
2. Lingual appliance allows easy access for routine oral hygiene procedures on these labial surfaces.
3. Clinical judgment of treatment progress can be enhanced.

- ✓ Evaluation of individual tooth position can be easily accomplished by having the labial surfaces free of distracting metal or plastic brackets.
- ✓ Soft tissue responses of lips and check to treatment can be judged accurately because there is no distortion of shape or irritation caused by a labial appliance.

DISADVANTAGES/LIMITATIONS

1. Significant drawback to lingual therapy appears to be the discomfort to the tongue, and with it, difficulty in speech.
2. Sensitive to laboratory techniques
3. Extended chair time needed for appliance placement.
4. Not as cost effective as labial technique (cost increased by 30-50%).

CONCLUSION

Lingual braces have been and are viable treatment option. With these appliances the practitioners can

achieve excellent results while providing his or her patient's with a unique and valuable service.

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Prevalence Study of Overweight/Obesity Among Adults (20-60yrs) of Rural Field Practice Area of Osmania Medical College, Hyderabad

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ABSTRACT

BACKGROUND: There is an alarming increasing in the prevalence of overweight and obesity worldwide with globalization of economics and rapid international communication. Andhra Pradesh prevalence of overweight and obesity in males is 7.2% and females are 7.8% in rural areas. The prevalence of obesity in adults is 10% in rural areas of Andhra Pradesh.

OBJECTIVE: 1. To study prevalence of overweight/obesity among adults (20-60yrs) in the field practice area of OMC, Hyderabad. 2. To study the relationship between overweight/obesity with physical activity and dietary factors. 3. To study the morbidity patterns among overweight/obesity individuals.

MATERIALS AND METHODS: The patancheruvu mandal consists of 13 villages, 3 villages were selected randomly and households were selected by systematic random method, a sample of 900 subjects was interviewed with pretested proforma. Age, sex, height, weight, blood pressure, diabetes, dietary patterns, smoking, alcoholism, CAD were recorded from March 2005 to February 2006.

RESULTS: The prevalence of overweight/obesity was 25%. Among males 34.82% and Females 19.76%. Among age group 51-60yrs, 46.73% were overweight/obese and the association between <40yrs and >40yrs was significant $p < 0.001$. Among sedentary workers 95.82% were overweight/obese and the association between moderate and sedentary workers was significant $p < 0.007$. Morbidities among subjects with BMI > 30 were HTN 3.74%, DM 0.78%, joint pains 26.58%, respiratory diseases 5.06%.

CONCLUSIONS: The overall prevalence of overweight/obesity was 25% in the study population. 34.82% in males and 19.67% in females. As the age increases overweight/obesity also increases along a gradient till 60+yrs. High literacy, alcoholism and low physical activity were significantly associated with overweight/obesity. As BMI increases morbidities tend to increase in rural area.

BACKGROUND

There is an alarming increasing in the prevalence of overweight and obesity worldwide with

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globalization of economics and rapid international communication. Andhra Pradesh prevalence of overweight and obesity in males is 7.2% and females are 7.8% in rural areas¹. The prevalence of obesity in adults is 10% in rural areas of Andhra Pradesh². Obesity is increasing at an alarming rate through out the world. Today, it is estimated that there are more than 250 million obese people world-wide, equivalent to 7% of the adult population (WHO, 1998)³. The prevalence of obesity is increasing in most of the populations of world, affecting men, women and children. Furthermore, obesity is no longer just a concern for

developed countries, but it is becoming a serious problem in many developing countries. A number of factors have been linked to obesity, including age, gender and socioeconomic status. In developed countries levels of obesity are higher in the lower socio-economic groups, but in developing countries this relationship is reversed (Sobol and Stunkard, 1989⁴; Randrianjohany et al., 1993⁵). However, it may be noted that this phenomenon is more profound among the urban populations in comparison to the rural ones (Venkatramana and Chengal Reddy, 2002⁶). The increased levels of obesity is associated with the transition from rural to urban lifestyle. The urban lifestyle has been linked with dramatic changes leading to increased consumption of high energy dense foods and decrease in physical activity. Though, under nutrition continuous to be a problem in most of the tribal and rural communities (Venkatramana and Chengal Reddy, 2002⁷; Nirmala Reddy, 1998)⁸, the prevalence of overweight and obesity have been showing an increasing trend for the last few years among the Indian populations (Gopalan, 1988)⁹. The division of non communicable diseases (NCD) at WHO (1997)¹⁰ has warned that the overweight and obesity pose a major public health issue which demands urgent attention. Further, obesity has got positive association with many CHD risk factors like cholesterol, HDL cholesterol and blood pressure (Venkatramana and Chengal Reddy, 2002).

RATIONALE OF THE STUDY

Available evidences show that one of the effective ways to prevent obesity in the adult life may be prevention and management of childhood and adolescent overweight and obesity. A fundamental step in the prevention and control of obesity is the identification of risk factors contributing to the rapid increase of obesity. Relevant research in this area, in Andhra Pradesh is minimal and the data available is mostly inconsistent and often based on statistically inadequate sample size, making it difficult to assess the prevalence of overweight and obesity at State level. Therefore, it was proposed to carry out a study to assess and identify the prevalence and correlates of overweight and obesity among rural population with adequate sample. The findings of the survey will help in formulation of strategies to prevent and control the problem among the adult groups.

OBJECTIVES

1. To study the prevalence of overweight and obesity among adults (20—60yrs) in the rural field practice area of Osmania medical college, Hyderabad.
2. To study the relationship between overweight/obesity with physical activity and dietary factors.
3. To study the morbidity patterns among overweight/obesity individuals.

MATERIAL AND METHODS

The rural field practice area of Osmania medical college was patancheruvu a mandal under Medak district and caters a population of one lakh and twenty thousands which consists of 13 villages. Out of 13 villages 3 villages were selected for study by random method. Three villages Ismailkhan pet, Chitkul and Ghanpur which were 10-15kms away from rural health centre patancheruvu. The Ismailkhan pet subcentre caters population of 3082 and similarly chitkul-3260 population and Ghanpur-1930 population respectively.

Study period: one year i.e. from March 2005 to February 2006.

Calculation of sample size: prevalence of overweight / obesity in Medak district was 10%. Sample size 900 subjects. ($n=4pq/l^2$, error=20%)

Selection of house holds: In a village first reached the centre of the village and numbering was given to each house hold from centre to periphery with the help of B.S.C nursing students. Then reached the north east corner of village and started the house hold survey by random number method. The random number is 5 then the survey started from the 5th house onwards and the subjects who were above 20yrs and below 65yrs were interviewed with pretested proforma and anthropometric measurements were taken and moved on to next house i.e. 5+5=10th house and so on till get the required sample size (i.e. 300 in each village). The same procedure was adopted in other two villages. A proforma was designed and approval was taken from ethical committee of O.M.C. and pilot study was conducted and tested. A total of 900 subjects were interviewed for over weight and obesity and preventive measures were suggested to them during the one year period.

Exclusion criteria: pregnant women, physically handicapped were excluded.

TOOLS USED

1. A pretested questionnaire was used to interview the subjects after taking oral consent.
2. Height was measured with stadiometer to the nearest 0.5cm.
3. Weight was measured with bath room weighing scale to nearest 0.5kg.
4. BMI was classified according to W.H.O. classification.

5. Blood pressure was measured by sphygmomanometer according to J.N.C VII 2005 classification.

Description of variables: age, sex, literacy, occupation, socioeconomic status, physical activity, alcohol consumption, smoking, practice of exercise, diet, family history, blood pressure, diabetes & coronary heart diseases (which were previously diagnosed and are on treatment only were included in the study) anthropometry were recorded.

Statistical analysis: Analysis by simple proportions and chi-square test.

RESULTS

TABLE 1. Prevalence of Over Weight/Obesity in the Study Population

Sex	BMI		
	<25	e"25	Total
Male	204(65.18)	109(34.82)	313
Female	471(80.24)	116(19.76)	587
Total	675(75.00)	225(25.00)	900

(X²=24.70, P<0.0001, 1df)

Among the subjects males are having higher prevalence of over weight/obesity of 34.82% than females 19.76% and the observed difference was significant.

Table 2: Age wise prevalence of over weight/obesity in the study population:

AGE	BMI		TOTAL
	<25	e"25	
20-30	315(84.22)	59(15.78)	374
31-40	174(74.68)	59(25.23)	233
41-50	102(71.33)	41(28.67)	143
51-60	84(56)	66(44)	150
TOTAL	675(75)	225(25)	900

(X²=30.74, p<0.0001, 1df)

As the age increases the BMI also increases up to 60yrs and BMI was more among 51-60yrs. the observed difference between over weight/obesity among <40yrs and >40yrs was found to be statistically significant.

Table 3. Distribution of BMI among non-vegetarians;

Non-veg	BMI		Total
	<25	≥25	
>3times/week	30(36.58)	52(63.42)	82
<3times/week	453(74.81)	152(25.13)	605
Total	483(70.30)	204(29.70)	687

In the rural area increasing proportions of BMI (63.42%) are observed among subjects eating non-vegetarian >3times/week.

Table4: Distribution of BMI according to literacy status:

Literacy status	BMI		Total no
	<25	e"25	
Illiterate	257(80.06)	64(19.94)	321
Primary	70(76.04)	22(23.91)	92
Middle school	66(76.04)	20(23.06)	86
High school	127(70.17)	54(29.83)	181
Inter	115(87.12)	17(12.88)	132
Graduate/pg	40(45.45)	48(54.55)	88
Total	675(75)	225(25)	900

(x²=6.82, p<0.009,1df)

The observed difference between illiterates and literates was found to be statistically significant in rural area.

Table 5: Duration and quantity of alcohol consumption and distribution of BMI.

Quantity of alcohol	BMI		Total
	<25	e"25	
>5yrs/>100ml	8(26.66)	22(73.34)	30
<5yrs/<100ml	12(80)	3(20)	15
Total	20(42.55)	25(57.45)	45

X²=11.52, p<0.000, 1df.

Among rural area, the observed difference between alcohol consumption for >5yrs and <5yrs was found to be statistically significant.

Table 6: Distribution of BMI according to physical activity

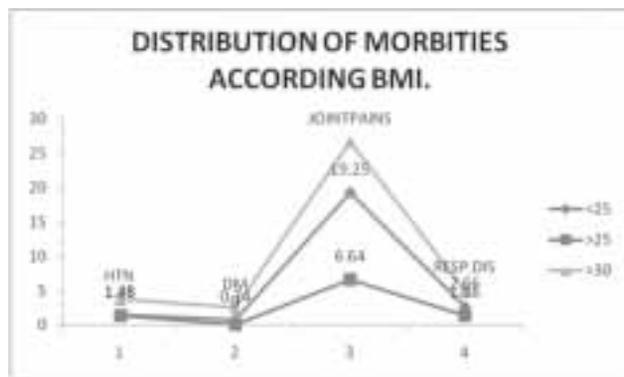
Physical activity	<25	e"25	Total
Sedentary	15(4.18)	343(95.82)	358
Moderate	64(11.80)	478(88.20)	542
Total	79(8.77)	821(91.23)	900

(X²=15.63, p<0.0007, 4df)

The observed difference between moderate and sedentary workers of rural area was found to be significant.

Table7: Distribution of morbidities according to BMI.

BMI	MORBIDITIES					
	HTN	DM	NO DISEASE	JOINT PAINS	RESP.DISEASE	Total
<25	10(1.48)	5(0.74)	512(75.85)	130(19.25)	18(2.66)	675
e"25	2(1.36)	0(0)	132(90.41)	10(6.64)	2(1.36)	146
>30	3(3.74)	2(2.53)	49(62.00)	21(26.58)	4(5.06)	79
TOTAL	15(1.67)	7(0.78)	693(77)	161(17.84)	24(2.670)	900



Among rural subjects with BMI>30 HTN was 3.74%, DM was 2.53%, joint pains was 26.58% and respiratory disease was 5.06%. As BMI increases morbidities also increases.

Discussion: The present study among rural area shows prevalence of over weight/obesity was more among males (34.82%) than females (19.76), it correlates study conducted by REEDER BA et al¹¹ on the regional and the rural urban differences in Canada, and they concluded that obesity was 41% in rural men and 35% in rural women.

Regarding age prevalence of over weight/obesity was increasing with age up to 60yrs.it correlates the study conducted by Amoah AG et al¹²on sociodemographic variations in obesity among Ghanaians adults they concluded that obesity increased with age up to 64yrs. Findings regarding literacy status and overweight/obesity showed that as literacy status increases BMI also increases and the study correlates with the study conducted by Amoah AG et alon sociodemographic variations in obesity among Ghanaian adults. He concluded that subjects with tertiary education had the highest prevalence of obesity compared with less literate and illiterate subjects. In rural area sedentary workers were 95.82% and moderate workers 88.20% with BMI>25 and difference was significant. It correlates the study conducted by Sood RK et al¹³and concluded that prevalence of obesity was less in those subjects having moderate physical activity compared to those with low physical activity. Alcohol has significant influence on prevalence of over weight\obesity. It correlates with

the study conducted by S.Goya wannamethee and A Gerald shaper et al¹⁴ on alcohol, body weight, and they concluded that heavy intake (>30gms/day) contributes directly to weight gain. Findings regarding morbidities and overweight/obesity are subjects with BMI>30, HTN was 3.74%, DM was 2.53%, joint pains was 62.00%.when compared to BMI>25—29.99, HTN was 1.36%, joint pains was 6.84%.as the BMI increases morbidities also increases. It correlates the study conducted by Rczende FA, Rosado et al¹⁵ on BMI and waist circumference association with cardiovascular risk factors and they concluded that the frequency of cardiovascular risk factors increased along with BMI.

CONCLUSIONS: The over all prevalence of over weight/obesity was 25% in the study population. 34.82% in males and 19.67% in females. As the age increases overweight/obesity also increases along a gradient till 60+yrs. High literacy, alcoholism and low physical activity were significantly associated with over weight/obesity. As BMI increases morbidities tend to increase in rural area.

SIGNIFICANCE OF THE STUDY

The purpose of this project is to first, describe the significance of the current adult obesity epidemic and explore the physical, environmental and societal factors that play a pivotal role in putting adults at risk. Obesity interventions and gaps in obesity prevention programs will be reviewed, selected theories and models of behavior change will be discussed, and knowledge deficits among parents and children will be identified. Health education regarding low fat diet, physical activity and change in life style modifications are suggested to the community.

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Prevalence Study of Overweight/Obesity Among Adults (20-60yrs) of Urban Field Practice Area of Osmania Medical College, Hyderabad

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ABSTRACT

Background: There is an alarming increasing in the prevalence of overweight and obesity worldwide with globalization of economics and rapid international communication. Andhra Pradesh prevalence of overweight and obesity in males is 27.27% and females are 44.64% in urban areas. The prevalence of obesity in adults is 20-40% in urban areas of Andhra Pradesh.

Objective: 1. To study prevalence of overweight/obesity among adults (20-60yrs) in the urban field practice area of OMC, Hyderabad. 2. To study the relationship between overweight/obesity with physical activity. 3. To study the morbidity patterns among over weight/obesity individuals.

Materials And Methods: The urban health centre consists of 41 slums, 3 slums were selected randomly and households were selected by systematic random method, sample of 400 subjects were interviewed with pretested profroma. Age, sex, height, weight, blood pressure, diabetes, dietary patterns, smoking, alcoholism, CAD are recorded from March 2005 to September 2005.

Results: The prevalence of overweight/obesity was 37%. Among males 27.27% and females 44.64%. Among age group 51-60 yrs, 45.45% were overweight/obese and the association between <40yrs and >40yrs was significant $p < 0.001$. Among non regular exercise 47.05% were overweight/obese and the association between non regular exercise and regular exercise was significant $p < 0.001$. Morbidities among subjects with BMI >25 were HTN 12.16%, DM 13.52%, joint pains 31.08%, respiratory diseases 8.01% and CAD 1.35%.

Conclusions: The over all prevalence of over weight/obesity was 37% in the study population. 27.27% in males and 44.64% in females. As the age increases overweight/obesity also increases along a gradient till 60+yrs. High literacy, T.V. watching and low physical exercise were significantly associated with over weight/obesity. As BMI increases morbidities tend to increase in urban area.

Key words: Urban obesity, Exercises, Prevalence, Morbidities.

BACKGROUND

Obesity is a key factor in the natural history of other chronic and non communicable diseases¹. Globally,

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there are more than one billion over weight adults, at least 300 million of them are obese². Globesity is fast becoming more of a problem than famine and under nutrition, and has now reached a point where it is becoming a serious threat to the health of every nation striving for economic development³. The prevalence of over weight and obesity in India is 20-40% in urban area⁴. Because of urbanization and industrialization, our lives are becoming more sedentary and less physically active than it was before. Women are spending most of their leisure time in front of T.V.

household durable goods like washing machines, cooking gas and electric ovens etc again reduce the physical activity. Application of transportation even for shorter distance is increasing. All these prevent the people from physical activity and leads to over weight and obesity. At the same time, consumption of oily and junky food is responsible for over weight and obesity. Obesity is not immediate lethal disease itself, but it is a significant risk factor associated with a range of serious non communicable diseases and conditions.

OBJECTIVES

1. To study the prevalence of overweight and obesity among adults (20-60yrs) in the urban field practice area of Osmania Medical College, Hyderabad.
2. To study the relationship between overweight/obesity with physical activity .
3. To study the morbidity patterns among over weight/obesity individuals.

MATERIALS AND METHODS

The present study was carried out in the urban health centre area Harajpenta,Hyderabad. It functions under Municipal Corporation of Hyderabad, A.P which was the field practice area of Osmania medical college, Hyderabad. The urban health centre consists of 41 slums caters a population of 58,902. Three slums i.e., Krishna Nagar, Nehru Nagar and Sunder Nagar B were selected for study by random method which caters a population of 3235, 3229 and 1947.

Calculation of Sample Size: Sample size for this study can be drawn from prevalence of overweight/obesity in urban area was 20-40%. Based on the formula $4pq/l^2$ error was taken as 20% so the sample size is 400 subjects.

Selection of households: In harajpenta, houses were numbered from centre to periphery. Using systematic random sampling every 3rd house was selected. Household was picked up randomly to start the survey. The random number is 3, then the survey started from the 3rd house and the subjects were interviewed with pretested profroma and anthropometric measurements were taken. And then moved on to next house i.e. 3+3=6 thhouse and so on till get required sample size (i.e. 400). A profroma was designed and approval was taken from ethical committee of Osmania medical college and pilot study was conducted and tested. A total of 400 subjects were interviewed for over weight and obesity, after taking oral consent and preventive measures were suggested to them.

Study period: March 2005 to September 2005.

Exclusion criteria: pregnant women, physically handicapped were excluded.

Tools used:

1. A pretested questionnaire was used to interview the subjects after taking oral consent.
2. Height was measured with stadiometer to the nearest 0.5cm.
3. Weight was measured with bath room weighing scale to nearest 0.5kg.
4. BMI was classified according to W.H.O. classification.
5. Blood pressure was measured by sphygmomanometer according to J.N.C VII 2005 classification.

Description of variables: Age, sex, literacy, occupation, socioeconomic status, physical activity, alcohol consumption, smoking, practice of exercise, diet, family history, blood pressure, diabetes & coronary heart diseases(which were previously diagnosed and are on treatment only were included in the study) anthropometry were recorded.

Statistical analysis: Analysis by simple proportions and chi-square test.

RESULTS

Table 1. Prevalence of over weight/obesity in the study population

Sex	BMI		
	<25	≥25	Total
Male	128(72.73)	48(27.27)	176
Female	124(55.36)	100(44.64)	224
Total	252(63.00)	148(37.00)	400

($\chi^2=12.76$, $P<0.003$, 1df)

Among the subjects females are having higher prevalence of over weight/obesity of 44.64% than males 27.27% and the observed difference was significant.

Table 2. Age wise prevalence of over weight/obesity in the study population:

AGE	BMI		TOTAL
	<25	≥25	
20-30	44(73.33)	16(26.67)	116
31-40	72(72)	28(28)	100
41-50	88(57.89)	64(42.11)	152
51-60	48(54.54)	40(45.45)	88
TOTAL	252(63)	148(37)	400

($\chi^2=10.32$, $p<0.001$, 1df).

As the age increases the BMI also increases up to 60 yrs and BMI was more among 51-60 yrs.the observed difference between over weight/obesity among <40 yrs and >40 yrs was found to be statistically significant.

Table 3. Distribution of BMI according to literacy status

Literacy status	BMI		Total no
	<25	≥25	
Illiterate	104(74.29)	36(25.71)	140
Primary	52(52.00)	48(48.00)	100
Middle school	32(44.44)	40(55.56)	72
High school	40(76.92)	12(23.08)	52
Inter	12(75.00)	8(40.00)	20
Graduate/pg	12(75.00)	4(25.00)	16
Total	252(63.00)	148(37.00)	400

(X²=11.77, p<0.0006, 1df)

The observed difference between illiterates and literates was found to be statistically significant in urban area.

Table 4. Distribution of overweight/obesity according to occupation:

Occupation	Bmi		Total
	<25	≥25	
Labourer	37(78.82)	10(21.28)	47
Tenant/Cultivator	8(50)	8(50)	16
Artisans	37(75.51)	12(24.49)	49
Business	48(66.68)	24(33.32)	72
Professional	22(26.19)	62(73.81)	84
Others	100(75.75)	32(24.25)	132
Total	252(63)	148(37)	400

Among the professionals prevalence of overweight/obesity was very high 73.81% when compared to labourer 21.28%.

Table 5. Duration of TV Watching and distribution of over weight/obesity

TV Watching/Day	BMI		Total
	<25	≥25	
>2hr/Day	66(33.68)	130(66.32)	196
<2hr/Day	184(92)	16(8.)	200
Total	250(63.13)	146(36.87)	396

Note: 4 Subjects Never Watch Tv And Were Excluded From Analysis. X² =143.26, p<0.001, 1df.

The observed difference between television watching for >2hrs and<2hrs/day was found to be statistically significant.

Table 6. Distribution of regular/non regular exercise according to overweight/obesity

Practices of Exercise	BMI		Total
	<25	≥25	
Regular Exercise	38(76)	12(24)	50
Non Reg-exercise	18(52.95)	16(47.05)	34
Total	56(66.67)	28(33.33)	84

(x²=17.63, p<0.001,1df.) Note: 316 subjects never practiced any exercise.

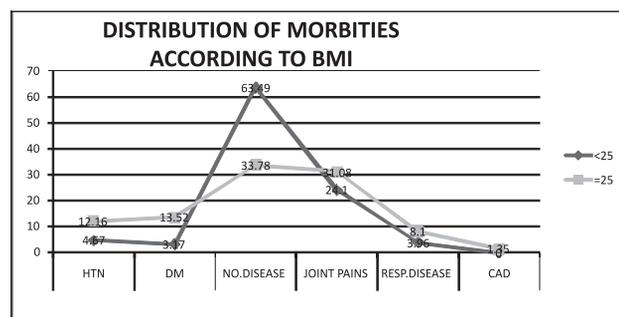
The observed difference between regular and non

regular exercises was found to be statistically significant.

Table 7. Distribution of morbidities according to BMI

BMI	Morbidities						Total
	HTN	DM	No. Disease	Joint Pains	Resp. Disease	CAD	
<25	12(4.76)	8(3.17)	160(63.49)	62(24.10)	10(3.96)	0(0)	252
≥25	18(12.16)	20(13.52)	50(33.78)	46(31.08)	12(8.10)	2(1.35)	148
Total	30(7.5)	28(7)	210(52.5)	108(27)	22(5.5)	2(0.5)	400

Among urban subjects with BMI>25 HTN was 12.16%, DM was 13.52%, joint pains was 31.08% and respiratory disease was 8.10%,CAD was1.35%. As BMI increases morbidities also increases.



DISCUSSION

The present study among urban area shows prevalence of over weight/obesity was more among females (46.64%) than males (27.27%), it correlates study conducted by Das Guptas.hazra SC et al⁵ in their study where 500 men and 500 women were included in the study from out patient department and indoor wards of medical college Calcutta noted that only 7% of males and 16% of females had BMI> 25. The probable cause could be study was conducted among patients from out patient department and indoor wards of hospital.

Regarding age prevalence of over weight/obesity was increasing with age up to 60yrs.it correlates the study conducted by Sood R.K. et al⁶ in their "An epidemiological study of obesity in simla town" have noted that prevalence of obesity rose significantly with age taking cutoff points of BMI>25.

Findings regarding literacy status and overweight/ obesity showed that as literacy status increases BMI also increases and the study correlates with the study conducted by Amoah AG et al⁷ on "sociodemographic variations in obesity among Ghanaian adults". He concluded that subjects with tertiary education had the highest prevalence of obesity compared with less literate and illiterate subjects.

Findings regarding physical exercise of BMI ≥ 25 among non regular exercise was 47.05% compared to regular exercise subjects and was statistically significant. It correlates with the study conducted by Bhasin.S.K.Chaturvedi S, Gupta P et al⁸ in their study "status of physical exercise and its association with obesity and hypertension in urban area" and they concluded that prevalence of obesity in group doing regular exercise was less than that not doing and the results were statistically significant.

Findings regarding morbidities and overweight/obesity of subjects with BMI ≥ 25 , HTN was 12.16%, DM was 13.52%, joint pains was 31.08% and CAD was 1.35% as the BMI increases morbidities also increase. It correlates the study conducted by Rezende FA, Rosado et al⁹ on BMI and waist circumference association with cardiovascular risk factors and they concluded that the frequency of cardiovascular risk factors increased along with BMI.

CONCLUSIONS

The overall prevalence of overweight/obesity was 37% in the study population. 27.27% in males and 44.64% in females. As the age increases overweight/obesity also increases along a gradient till 60+yrs. High literacy, T.V. watching and low physical exercise were significantly associated with overweight/obesity. As BMI increases morbidities tend to increase in urban area.

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Age and Gender related changes in Body Composition in Pre-adolescents

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Abstract

Background: The present study was initiated with the main objective to assess the changes of body composition as related to age, gender during pre-adolescence (9-12 years).

Methods: The study was conducted on 450 pre-adolescents of 9-12 years.

Results: Skin-fold thickness was higher in girls than boys indicating higher fat content in girls. Age and gender related differences in body composition indicated that body stat 1500 analyser (BSA) fat mass (% and kg) decreased with an increase in age whereas it was decreased when derived from skin-fold thickness (SFT) in both the genders. BSA and SFT fat free mass (% and kg) increased with an increase in age significantly in boys and girls. Mean fat free mass (% and kg) and water (% and kg) were significantly higher in boys than girls. The mean fat (% and kg) was significantly higher in girls than boys. Body composition as related to weight indicated that the lean body mass was significantly higher in the subjects who had maximum weight than the subjects with minimum weight. BSA fat mass and fat free mass were significantly differed from SFT fat mass and SFT fat free mass indicating BSA was not suitable to assess body composition during pre-adolescence (9-12 years).

Conclusions: Significant age related and gender related differences in body composition exist in the pre-adolescent period.

INTRODUCTION

Growth produced changes in total body fat (TBF), percent body fat (% BF) and the fat free mass (FFM) during childhood affect adult body composition and fat distribution, all of which in turn, affect risk for cardiovascular and related diseases¹. Several studies have suggested relations between one of the accepted methods of determining body fat and a simpler technique, which could be widely applied. Hence an attempt to study the pattern of age and sex retained differences in total body fat (TBF), percent body fat (%BF) and fat free mass (FFM) during pre-adolescence (9-12 years) years was taken up. Workers who studied^{2,3} a group of pre-adolescents, found that the weight had increased significantly except for males at

12 years and females at 13 and 14 years. Vizmonas et al⁴ reported that boys presented a positive relation between age of pubertal onset and body mass index ($p < 0.01$) which was not observed in girls. The present study is aimed to describe the body composition of Pre-adolescents (9-12 years) by age, gender and to compare the agreement of BSA (Body Stat 1500 Analyzer) with the derived from Skin fold Thickness.

METHODOLOGY

A total number of 450 children were selected and grouped in 3 age groups *i.e.*, 9-10 years age group, 10-11 years age group and 11-12 years age group. Each age group consists of 75 girls and 75 boys. The subjects were drawn from schools of Hyderabad, India. Consent from the school principals, and the subjects taken and explained of the outcome before the start up of the study. Skin-fold thickness was measured to the nearest 0.05 mm on the left side of the body from sites *i.e.*, triceps, biceps, sub scapular and suprailliac by using Harpenden's calipers⁵. The percent body fat was calculated by using the formula: Fat (%) = [(4.95/

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density) — 4.5] +100(1)⁵. Later body composition was analyzed using BSA unit which works on the principle of Bioelectrical Impedance Analysis (BIA) and the parameters included are fat (% and kg), Fat free mass (% and kg) and water (% and liters). Data analysis was done using mean and standard deviation, analysis of variance, correlation coefficient, z-test and paired t-test.

RESULTS

Sex related differences in body composition were observed in boys and girls in table 1. The mean fat (% and kg) was significantly (p>0.005) higher in girls (52.4% and 13.2 kg) than boys (41.9% and 10.2 kg) where as the mean fat free mass was higher significantly (p>0.005) in boys (57.5% and 12.4 kg) than girls (44.6% and 14.6 kg)(2). The mean water levels (% and liters) were also higher in boys (77.1% and 21.2 liters) than girls (72.7% and 18.6 liters).

The correlation results also showed that skin fold thickness strongly correlated with body weight (0.01%) (r.0.208) and a negative correlation (0.01%) (r.0.208) was observed between BSA fat mass (%), water (% and liters) and body weight. There was a positive correlation between weight and fat free mass (0.01%) (r.0.208) and negative correlation between fat mass and lean mass. It was also calculated that there was a significant difference at 5% level in the fat free mass (%) between the subjects who have maximum weight than minimum weight subject and significant difference was observed in both genders. (table 2)

years and 11.4 kg at 11-12 years. The corresponding decrease in total body fat for boys was from 10.2 kg at 9-10 years and 9.1 kg at 11-12 years. Similarly, the average percent body fat decreased from 52.4% to 36.5% in girls and 41.9% to 26.4% in boys. The overall increase in fat free mass from 9-12 years was found both in boys and girls. The average amount of fat free mass increased about 14.4 kg in boys and 7.6 kg in girls (Table 3).

The mean BSA fat mass (% and kg) decreased with increase in age (41.9 to 26.4, boys and 52.4 to 36.5, girls) whereas SFT fat (% and kg) increased with an increase in age from 9-12 years (17.6 to 22.7, boys and 21.5 to 29.4, girls). BSA and SFT fat free mass (% and kg) increased with an age in boys and girls. BSA fat mass (%) was significantly higher (p <0.01) than SFT fat (%) except at the age of 11-12 years in boys where as significant difference (p <0.05) was observed between BSA fat (kg) and SFT (kg) except at the age of 9-10 years in girls. SFT fat free mass (% and kg) was higher than BSA fat free mass (% and kg) in boys and girls of all age groups.(table 3)

DISCUSSION AND CONCLUSIONS:

The study examined the pattern of age and gender related changes in body fat (% and kg), fat free mass (% and kg), and water (% and l) during pre-adolescence (9-12 years). The body composition was assessed using body stat 1500 analyser. The variables assessed that the mean values for body fat (% and kg) was significantly higher (P<0.01) in girls than boys in all

Table 1. Mean body composition (mean±SD) of pre-adolescents (9-12 years)

Variables	Age (years)											
	9-10 years			10-11 years			11-12 years			Total		
	Boys	Girls	Z-value	Boys	Girls	Z-value	Boys	Girls	Z-value	Boys	Girls	Z-value
Fat (%)	41.9± 9.4	52.4± 13.7	3.6**	37.3± 12.7	43.8± 18.5	2.5*	26.4± 6.8	36.5± 17.9	4.5**	35.2±11.9	44.2±21.0	5.6**
Fat (kg)	10.2±1.5	13.2±4.4	5.4**	10.2±1.7	12.3±4.0	4.2**	9.1±2.0	11.4±3.8	4.4**	9.8±1.8	12.3±4.2	8.0**
Lean (%)	57.5±10.6	44.6±21.4	4.6*	63.0±11.9	52.0± 20.6	3.9**	73.5±6.9	64.1±17.3	4.3**	64.7±11.9	53.6±21.5	6.7**
Lean (kg)	12.4±7.3	14.6±4.3	2.2**	19.4±16.5	18.8±6.8	NS	26.8±7.0	22.2±10.0	3.1**	20.1±7.9	18.0±12.6	2.0*
Water (%)	77.1±10.2	72.7±11.6	2.4*	73.3±12.4	68.2±11.5	2.5**	72.2±8.1	64.5±7.0	6.2**	74.2±10.6	68.4±10.8	5.6**
Water (l)	21.2±4.9	18.6±1.4	4.4**	22.4±2.8	19.8±2.2	6.0**	25.2±6.1	22.6±2.5	3.3**	22.9±5.1	20.3±2.7	6.6**

NS- non significant
 *- significant at 1% level
 **- significant at 5% level

Table 2. Factors affecting body composition.

Gender	Fat free mass (%)		z- value
	Minimum weight	Maximum weight	
Boys (225)	57.5±24.4	73.5±27.2	6.3*
Girls (225)	45.6±23.2	64.5±25.4	5.7*

*Significant at 5% level

The total body fat and percent body fat decreased with increase in age in both genders. The average decrease in total body fat for girls was 13.2 kg at 9-10

the age groups. The significant increase in body fat in girls (44.2% and 12.3 kg) than boys (35.2% and 9.8 kg) and the greater degree of fatness compared with boys is due to greater production of estrogen¹ in the girls during menarche. The results of fat free mass indicate that boys have higher fat free mass (% and kg) than girls in all the age groups except at the age group of 10-11 years old. The significant difference (P<0.01) in the amount of changes in fat free mass between boys (64.7% and 20.1 kg) and girls (53.6% and 18.0 kg) might be due to the production of testosterone hormone by the males which plays an important role in muscle size and skeletal mass in boys.

Table 3. Comparison of body composition from body stat 1500 analyser (BSA) and skin fold thickness (SFT)

	Boys (years)			Girls (years)		
	9-10	10-11	11-12	9-10	10-11	11-12
% BSA FM	41.9±9.4	37.3±12.7	26.4±6.8	52.4±23.1	43.8±18.5	36.5±17.9
% SFT FM	17.6±3.9	21.8±4.8	22.7±2.7	21.5±5.6	27.2±7.0	29.4±7.5
z-value	24*	15.5*	3.7**	31.1*	16.6*	7.1*
% BSA FM	10.2±1.5	10.1±1.7	9.1±2.0	13.2±4.4	12.3±4.0	11.4±3.8
% SFT FM	5.1±0.8	6.6±1.0	7.7±1.1	5.3±1.7	7.8±2.5	10.4±3.3
z-value	5.0**	3.5**	1.4**	5.4*	4.5**	1.0**
% BSA FM	57.5±10.6	63.0±11.9	73.5±6.9	45.6±21.4	52.0±20.6	64.5±17.3
% SFT FM	82.4±15.1	78.2±14.7	77.3±7.2	78.5±36.8	72.8±34.2	70.6±33.0
z-value	24.9*	15**	42.0**	32.9*	20.8*	6.1*
% BSA FM	12.4±7.3	19.4±11.9	26.4±15.7	14.6±4.3	18.8±6.8	22.2±10.0
% SFT FM	24.1±14.1	24.0±14.1	26.6±15.6	19.7±5.8	21.2±6.2	25.0±7.3
z-value	11.6*	5.0*	0.2**	5.1**	2.4**	3.2**

*: significant at 1% level, **: significant at 5% level.

Mean fat (% and kg) values of girls were found to be higher than values studied by Tahara et al⁶ in Japanese girls and reported fat (% and kg) values were 15.7% and 5.9 kg at 11 years age. The large difference may be due to the cultural pressure on Japanese girls to remain thin. The mean fat (% and kg) of girls was greater than Caucasian girls¹ which may be due to ethnic group differences. Higher triceps, biceps and skin fold measurements in girls for the present study were observed to be higher than Japanese girls and Caucasian girls^{6,1}.

The mean fat (% and kg) of boys were observed to be higher than Spanish, Caucasian and Japanese boys studied by other workers. The mean fat (%) and fat (kg) in all the age groups were 41.9% (9-10 years), 37.3% (10-11 years) and 26.4% (11-12 years). The difference might be due to the differences in life style, environmental factors, genetic and physical activity. The similar results were reported by Ellis et al⁷ who studied that Hispanic males had higher body fat values than the white group and black groups where as black males generally had lower values than white group. The mean fat free mass values of boys in all age groups were 57.5 (9-10 years), 63.0 (10-11 years) and 73.5% (11-12 years) which were reported to be lower than Caucasian, Spanish and Japanese boys was higher than those in the present study.

The mean (% and l) water levels are higher in boys (74.2% and 22.9l) than girls (68.4% and 20.3l). Chumela et al⁸ reported similar results and indicated that males had higher total body water and increased from the adolescent years to mid-adulthood and declined in adult age groups. The mean fat (% and kg) decreased with an increase in age in boys and girls. This is strongly supported by Owa et al⁹ and Sarria et al² who reported that fat (% and kg) decreased with an increase in age in boys. The decrease in fat content of girls with an increase in age may be due to low fat intake and socio-economic status. Sandhya¹⁰ reported that the

intake of fat was found to be less and intake of fruits was more in the girls compared to boys.

A negative correlation was observed between fat mass (%), water (% and l) and body weight ($r=0.20$, $P<0.01$) indicating that with increase in body weight, water (% and l) and fat mass decreased. Fat mass (%) was negatively correlated with lean mass ($r=0.20$, $P<0.01$) indicating that with increase in fat free mass, the fat mass decreased. BSA fat mass (Body stat 1500 analyser) was significantly higher ($P<0.05$) than fat mass derived from SFT (skin fold thickness) (% and kg) whereas SFT fat free mass (% and kg) was significantly higher ($P<0.05$) than BSA fat free mass (% and kg).

Hence, assessment of body composition by BSA was not in agreement with that of SFT at the age of 9-10 years indicating that the BSA does not read the body composition of young children. But at the age of 11-12 years the agreement between BSA and SFT increased indicating BSA was suitable to assess body composition from 11 years onwards.

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Incidence of Parasitic Infestations in Rural School Children of Age 5-12 Years at Davangere District, Karnataka

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ABSTRACT

Background: Worm infestation is one of the major cause of childhood malnutrition, anaemia, physical and mental growth and psycho-social problems. The study aims to compare the prevalence of parasitic infestation and optimization of number of stool samples for screening of parasitic infestation among school children of age 5-12 years at rural areas of Davangere district.

Materials & Methods: This is a cross-sectional study conducted during the month of June 2009 to October 2010. Five stool samples on five consecutive weekends were collected from each of the 474 children. Stools were examined for the presence of intestinal parasites.

Results: Out of the 474 samples, 237 were positive by the end of 5th week stool sample. Nearly 89.9% of the parasites were identified in the first and second stool samples, 92.8% were identified by the 3rd stool sample, 95.4% were identified in the 4th stool sample and virtually all the parasites seen in the study were identified in the fifth stool samples. The prevalence of worm infestation is 50%. *Ascaris lumbricoides* (18.5%) and *Ancylostoma duodenale* (16.3%) were most common parasites. Majority of the children who were affected belong to early age groups and girls were more affected than boys.

Conclusion: From this study we conclude that 5th week stool sample detects virtually all the intestinal parasites and this clinically benefits the children compared to the single stool sample used for screening purposes.

Key words: Stool samples, Worm infestation, Rural children

INTRODUCTION

Intestinal helminthic infestation is one of the commonest causes of chronic infection in humans in developing countries^{1,2}. Indeed children of an endemic community can be expected to have intestinal parasitic infection soon after weaning and high risk of re-infection in the rest of their life³. The impure drinking water, low socio-economic state, poor sanitation coupled with low literacy rates of parents particularly the mothers are the main causes⁴. Worm infestation

leads to childhood malnutrition, anaemia, stunted physical and mental growth, psycho-social problems. It also causes recurrent gastrointestinal and upper respiratory tract infection contributing to high morbidity and mortality in children. Despite of improved socio-economic conditions and elevated living standards, surprisingly it is still a public health problem even in developed countries, like United States⁵. The reason for high prevalence is mainly because patients rarely report at health centre due to its slow progress of the signs and symptoms³. Helminthic infections are more prevalent among school children aged 5-14 years^{6,8}. They constitute 12% of total disease burden in children¹⁰. The hookworm infestation is a leading cause of iron deficiency anaemia, whipworm infestation in children causes growth retardation and anaemia, while heavy infestation with both roundworm and whipworm causes protein energy malnutrition^{11,12}. It is of

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particular concern that these infestations have insidious constraint on cognition and learning abilities of the children^{13,14}.

Because of the high prevalence and serious adverse effects of intestinal parasitic infestation in children, many studies have been conducted in various cities of India^{15,18}. However, most reports are based on single samples from a variety of patient groups and controls, and the community prevalence has not been documented in detail. We now report a detailed analysis of the prevalence of potentially pathogenic intestinal parasites in rural children at Davangere, Karnataka and to estimate the optimum number of stool samples which should be examined to give reliable and reproducible results.

MATERIALS AND METHODS

Type of study: A school based cross-sectional study deals with investigation of the frequency of intestinal worm infestation in children between the ages 5-12 years.

Study area: Three rural schools from Davangere district, Karnataka were selected and consented prior to the start of the study.

Period of study: June 2009 – October 2010.

Sample size: 474 school children were recruited between the age group of 5-12yr, which include both boys (49.1%) and girls (50.9%).

Inclusion and Exclusion criteria: The rural school caters to low socio-economic group of population. None of these individuals had any gastrointestinal symptoms during the period of sample collection. The age of children was ascertained by questioning them and later confirmed from school registers in case of any discrepancy between the two, the date in the school register was taken as accurate. Age in completed years was taken for analysis.

Stool sample: The importance of the study was explained to all children in the study population and

the method of collecting stool specimens were thoroughly made clear to all the children¹⁸. Five stool samples on five consecutive weekends were collected from each of the 474 children. Samples were collected in a wide mouthed plastic disposable container containing formalin and transported to the laboratory for parasitic examination^{18,19}.

Examination for parasites: Saline and iodine preparations from each sample were examined under 100X and 400X magnification²⁰. The smear was made and stained with safranin methylene blue stain for *Cryptosporidium* and examined under an oil-immersion²¹.

RESULTS

The overall prevalence of parasitic infestation was 50%. Multiple infestations were seen in 24 subjects. The most common parasitic helminth was *Ascaris lumbricoides* 44(18.6%), followed by *Enterobius vermicularis* 41(17.3%), *Ancylostoma duodenale* 39 (16.5%), *Trichuris trichiura* 37(15.6%), *Hymenolepis nana* 35(14.8%), *Giardia lamblia* 33(13.9%) and *Entamoeba histolytica* 08(3.4%). (Table 1)

Table 1. Parasitic profile

Parasites	Number	%
<i>Ancylostoma duodenale</i>	39	16.5
<i>Ascaris lumbricoides</i>	44	18.6
<i>Trichuris trichiura</i>	37	15.6
<i>Hymenolepis nana</i>	35	14.8
<i>Enterobius vermicularis</i>	41	17.3
<i>Giardia lamblia</i>	33	13.9
<i>Entamoeba histolytica</i>	08	3.4
TOTAL	237	50

Frequency of observation of parasitic infestation in five different stool samples is depicted in Table 2. Nearly 89.9% of the parasites were identified in the first and second stool samples, 92.8% were identified by the 3rd stool sample, 95.4% were identified in the 4th stool sample and virtually all the parasites seen in the study were identified in the fifth stool sample.

Table 2 Frequency of observation of parasitic infestation in five different stool samples

Parasites	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
<i>Ancylostoma duodenale</i>	33	36	37	39	39
<i>Ascaris lumbricoides</i>	43	40	41	44	44
<i>Trichuris trichiura</i>	32	34	36	35	37
<i>Hymenolepis nana</i>	32	33	34	31	35
<i>Enterobius vermicularis</i>	40	39	38	41	41
<i>Giardia lamblia</i>	27	25	29	29	33
<i>Entamoeba histolytica</i>	06	06	05	07	08
Total	213	213	220	226	237
Cumulative index (%)	89.9	89.9	92.8	95.4	100

In this study it was seen that girls were more infested 126 (53.1%) than boys 111(46.9%). (Table 3). Results showed that 83 (35%) children in the age group of 5-6yr were infected and 74 (31.2%) in the age group

of 7-8yr age. In age group of 9-10yr, 50 (21.1%) were infested and in the age group of 11-12yr of age 30(12.65%) were infested. (Table 4).

Table 3. Age and sex wise distribution of the children positive and negative for parasitic infestation

Age	Sex						Total		
	Boys			Girls					
	Positive	Negative	Total	Positive	Negative	Total	Positive	Negative	Total
5-6 yr	44	06	50	39	16	55	83	22	105
7-8 yr	38	15	53	36	29	65	74	44	118
9-10 yr	23	43	66	27	32	59	50	75	125
11-12 yr	06	47	64	24	38	62	30	96	126
Total	111	122	233	126	115	241	237	237	474

Table 4. Age wise distribution of parasites

PARASITE	5-6yr (n=105)	7-8yr (n=118)	9-10yr (n=125)	11-12yr (n=126)	TOTAL (n=474)	%
Hook worm	19	10	6	4	39	16.5
Ascaris lumbricoides	11	18	10	5	44	18.6
Trichuris trichura	13	10	6	8	37	15.6
Hymenolepis nana	9	14	7	5	35	14.8
Enterobius vermicularis	16	8	13	4	41	17.3
Giardia lamblia	13	9	7	4	33	13.9
Entamoeba histolytica	2	5	1	-	08	3.4
Total	83	74	50	30	237	51.1
Percentage	35	31.2	21.1	12.7		

DISCUSSION

Intestinal helminthiasis is common among children of developing countries particularly the rural areas. After careful screening, we observed that the frequency of intestinal parasites is very high in our region. This study reaffirms the findings of similar other surveys carried out earlier confirming the very high rate of helminthic infestations in our population as a whole and children in particular. It is estimated that as much as 60% of the world’s population is infected with gut parasites, which may play a role in morbidity due to intestinal infections¹⁴. The commonest parasitic infections reported globally are *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Trichuris trichura* and *Entamoeba histolytica*²². Few studies show the prevalence of worms infestation is 20-50%¹⁵ in some communities of the world. In a study done in Nigeria showed 49.7% intestinal helminthes with *Ascaris lumbricoides* and *Ancylostoma duodenale* as the predominant parasites¹⁶. In their study 23.6% children showed polyparasitism. But in our study 9.9% had polyparasitism. Worm infestation as reported is 31.8% in Turkey¹⁹, 19.3% in Iran²⁰, 47.2% in Afghanistan and 44% in Sudan²³. Main reason for less incidence of parasitic infestation in these

countries is mainly because they have taken single stool sample for screening purposes. There is a chance that they might have missed the parasite from a single sample. In our study we have collected five stool samples. The parasites those were missed in the first and second stool samples were identified in the subsequent samples. Prevalence is influenced by school and age but not by gender. Our study corroborates with the study carried out at Kathmandu, Nepal which reported 66.6% prevalence with significant difference between boys and girls¹⁷. In India overall prevalence range from 12.5% to 71.7%, with varying prevalence rates for individual parasites^{18, 23-26}. Study carried out at Gulbarga, have reported a prevalence of intestinal parasitism upto 71.7% among school going girls¹⁸.

In all other studies, author have taken single stool sample to screen for parasites^{6,17,21,23-26}. In our study we have collected five stool samples to increase the sensitivity of screening technique. In first & second week sample, 89.5% of parasites were observed. But in third sample 92.8% were positive for ova / cyst and in fourth sample 95.4% were positive and virtually all the parasites depicted in the study were identified in

the fifth stool sample. Hence we suggest at least 5 samples should be screened in the age group of 5-12 years to rule out intestinal parasitism. .

To conclude, the study revealed the presence of helminthic infection among study group. The high parasite prevalence rate observed in this study supports the idea that children are the most affected groups in the community. They also serve as source of infection and therefore responsible for parasite transmission in the community at large¹⁸. Though hook worm ova loads indicated mild to moderate infestation in most of the children, the continued presence of worms in marginally nourished children could contribute significantly to blood loss in the intestine with resultant anaemia²⁴. The high prevalence of parasitic infestation seems directly related to the unhygienic living conditions associated with lack of knowledge about the communicable disease & variety of allied factors²³ which need to be studied. In order to avert the harmful effects and complications of the this ignored problem, prompt preventive measures should be taken for the eradication of high infestation rate, which should include public health education, clean water supply, sanitation facilities, promoting personal hygiene and periodic deworming of the children. It would be also useful to teach them about personnel hygiene and conduct health education at schools through 'School Health Projects'. During the school health checkups, periodic screening for intestinal parasites and blood indices can be evaluated.

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