Homozygous Wildtype of XPD K751Q Polymorphism Is Associated with Increased Risk of Nasopharyngeal Carcinoma in Malaysian Population

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Abstract

The xeroderma pigmentosum group D (XPD) gene encodes a DNA helicase, an important component in transcription factor IIH (TFIIH) complex. XPD helicase plays a pivotal role in unwinding DNA at the damaged region during nucleotide excision repair (NER) mechanism. Dysfunctional XPD helicase protein from polymorphic diversity may contribute to increased risk of developing cancers. This study aims to determine the association between XPD K751Q polymorphism (rs13181) and risk of nasopharyngeal carcinoma (NPC) in the Malaysian population. In this hospital-based matched case-control study, 356 controls were matched by age, gender and ethnicity to 356 cases. RFLP-PCR was used to genotype the XPD K751Q polymorphism. A significant association was observed between XPD K751Q polymorphism and the risk of NPC using conditional logistic regression. Subjects with homozygous Lys/Lys (wildtype) genotype have 1.58 times higher odds of developing NPC compared to subjects with recessive combination of heterozygous Lys/Gln and homozygous Gln/Gln genotypes (OR = 1.58, 95% CI = 1.05–2.38 p = 0.028) adjusted for cigarette smoking, alcohol and salted fish consumption. Our data suggests that Lys/Lys (wildtype) of XPD K751Q contributes to increased risk of NPC in the Malaysian population.

Introduction

Nasopharyngeal carcinoma (NPC) originates from the epithelial lining of the nasopharynx. In most parts of the world, NPC is an uncommon cancer. The incidence proportion of NPC in the United States is as low as 1 per 100,000 population [1] whereas in Southeast Asia (mainly in Malaysia, Singapore and Indonesia) it averages 6.5 per 100,000 population [2]. According to the National Cancer Statistics Malaysia 2007, incidence proportion of NPC in Malaysia was 6.4