High Expression of Cyclooxygenase-2 in High Grade Human Prostate Adenocarcinoma
(Pengekspresan Tinggi Siklooksigenase-2 dalam Adenokarsinoma Prostat Manusia Gred Tinggi)

MOHD ROHAIZAD MD RODUAN*, NORHAFIZAH MOHTARRUDIN, CHONG PEI PEI, MALINA OSMAN & NORAINI MOHD DUSA

ABSTRACT

Inflammation plays an important role to the process of prostate carcinogenesis by increasing the rate of cell proliferation, which contributes to an aggressive tumour phenotype. Cyclooxygenase-2 (COX-2) has been found overexpressed in various types of cancer cells including prostate. The aim of this study was to investigate the COX-2 expressions in different types of human prostate tissues. Paraffin-embedded prostate tissues from 263 samples were examined for the expression of COX-2 marker by immunohistochemistry method. COX-2 was found highly expressed in prostate adenocarcinoma (p = 0.001) as compared to benign and normal tissues. The score of COX-2 expressions in most of normal prostate was weak 49 (77.8%), while only 16 (16%) of BPH showed strong expression. 56 cases (56%) prostate cancer showed strong COX-2 expression. Prostate cancer cases showed significant differences in staining patterns as tumour grade increased. In addition, COX-2 expression was significantly correlated with Gleason score in cancerous tissues. This study suggests that COX-2 overexpression is associated with prostate cancer and higher grade tumour.

Keywords: Cyclooxygenase-2 (COX-2); immunohistochemistry; inflammations; overexpression; prostate adenocarcinoma

INTRODUCTION

Prostate adenocarcinoma (PCA) is one of the most frequently diagnosed cancers among males in Malaysia. A report by National Cancer Registry (2008) showed that, prostate cancer is the fourth frequent cancer occurred and accounted for 7.3% of the total cancers occurrence among males. Out of total cases, the majority of morphologically reported cases were adenocarcinoma which is 96%. Today diagnosis of prostate cancer is commonly based on morphological interpretation by use of cell architecture, nuclear features and presence or absence of basal cell layer. Nevertheless, this method is usually not adequate in equivocal cases in which it might require histopathologists to use immunohistochemistry (IHC) staining to resolve the differential diagnosis (Varma & Jasani 2005). Despite of the clinical importance of prostate cancer, understanding of mechanism underlying development and progression of this disease is poorly understood. Many researches have suggested that inflammation was linked to the development of tumours in several organs, including the prostate itself (Weitzman & Gordon 1993). Cyclooxygenase (COX), was referred as prostaglandin (PG) endoperoxidase synthase, is an enzyme that converts arachidonic acids to PGs and other eicosanoids. COX exists in two isoforms, namely COX-1 and COX-2. COX-1 is expressed constitutively in many tissues and cell types and involved in normal cellular physiological functions. Meanwhile, COX-2 exists as pro-inflammatory in nature and inducible by variety of factors, including growth factors, cytokines, tumour promoters and mitogens (Herschman 1991). Aberrant