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Prospected epigenetic moderators from natural sources and drug of class NSAIDS as effective treatment options to Prostate cancer

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ABSTRACT

Prostate cancer (PC) is one of the most common and leading cancer amongst the males all around the world. Depending upon it long latency and cost involved in its management and treatment, there is extensive need for more personalized and economical therapeutic approach for its effective therapy. The current review here discusses agents from natural dietary sources and drug class Non-Steroidal Antinflammatory (NSAIDS) that bears chemopreventive potential to regulate PC progression & tumour development and therefore could be devised into effective future treatment strategy against PC along with its metastatic castration-resistant form. Based on the literature search the therapeutic scope of selected agents are delineated, sighting their previous activity and prospects as epigenetic moderators in specific to particular PC causing biomarkers like over expression of AKR1C3, lost intracellular glutathione/glutathione-s-tranferases(GSH/GST) expression, DNA hypermethylation, aberrant cell proliferation and other related factors that are thought to potentiate and aggravate the onset of PC like smoking and use of other narcotics products.

1. Background

Prostate cancer (PC) is the fourth most common and second most prevalent cancer amongst males worldwide. In estimation to its mortality rates it is the 8th most consistent cause of cancer deaths around the world. It was estimated in year 2012 that around 1 111 000 new cases were diagnosed with PC out of which 307 000 were dead. While, New Zealand/Australia toped the chart with highest diagnosed cases, Caribbean islands and sub-Saharan African countries had witnessed to have maximum PC related mortality rates[1,2].

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There has been number of prominent biomarkers that have been associated at certain stages leading to onset and progression of PC. Some to be seriously considered includes over expression of AKR1C3 enzyme leading to castrate resistant PC. AKR1C3 originally functions via reducing 4-androstene-3, 17-dione (△ (4)-Adione) to the androgen receptor (AR) ligand testosterone i.e. fostering conversion of ketones and aldehyde to respected alcohols using NADH/NADPH as cofactors[3-5]. It also bear critical role catalyzing reduction of steroids, prostaglandins,PGH2, D2, phenantherenequinone, oxidation 9-alpha,11-beta-PGF2 to PGD2 and pathogenesis of certain diseases like diabetic complications, steroid hormone dependent malignancies including PC via regulating/controlling cell proliferation/differentiation etc[6-8]. Aberrant up regulation in normal AKR1C3 enzyme and its related gene functionality in PC is mainly due to intracellular synthesis