

CO-ORGANIZED EVENT

13th International Conference on Clinical Gastroenterology & Hepatology & 2nd International Conference on Digestive Diseases

December 07-08, 2017 Madrid, Spain

Role of aromatase (*CYP19A1*) in colorectal cancer etiology, and effect of gene polymorphisms in cancer development and treatment

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In the last decade, the role of estrogens in the etiology of cancer has been well documented. Estrogen levels have been implicated as both protective and predisposing factors in cancer development. Studies have shown that the production of estrogens in tissues results in local elevation and has a deteriorating effect on cancer development and prognosis. Aromatase cytochrome p450 enzyme (*CYP19A1*) is involved in the synthesis of estrogens and converts estrone to estradiol. It has become a target of extensive research, where aromatase inhibitors are employed as treatment strategies for several cancers. Several genetic variations have been reported in the *CYP19A1* gene that alters aromatase expression or its activity and influence the risk of cancer development. We genotyped six single nucleotide polymorphisms (SNPs) (rs4774585, rs936308, rs4775936, rs28757184, rs700518 and rs4646), in *CYP19A1* gene in patients suffering from colorectal cancer, and compared the results with normal healthy controls. We also studied the level of gene expression of aromatase in cancer tissue compared to adjacent normal tissue. The SNP rs936308 was significantly associated with rectal cancer, rs4774585 to colorectal cancer in male patients and rs4775936 in the female patients. The aromatase gene expression was elevated in the cancer tissue and aromatase protein level was high as confirmed by immunohistochemistry. In silico studies were conducted on rs28757184, a missense mutation, and showed structural variations. This presentation will discuss the role of aromatase in colorectal cancer development and will present the genetic variations reported so far and their effect on the pathogenesis of colorectal cancer.

Biography

Arjumand Warsy is a Professor at Department of Biochemistry in the College of Science at King Saud University, Saudi Arabia. She has completed his PhD in 1974 from the Department of Applied Biochemistry and Nutrition at University of Nottingham, UK. Her title thesis is: Study of proteinase inhibitors in seeds of *Vicia faba* (Broad Bean). She was a Post-doctoral Research Associate at Department of Biochemistry, University of Birmingham, UK from 1973-1975. She joined Department of Biochemistry, College of Medicine, Sciences and Medical Studies, Department for Women Students, King Saud University in 1977.

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