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The contribution of vitamin D receptor (VDR) with colorectal cancer progression

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Clinical studies suggested that vitamin D is important in regulating signaling pathways and cellular processes. It exerts this effect through binding to the transcription factor, vitamin D receptor (VDR). Polymorphisms in the VDR gene have been associated with alter function of vitamin D and affect its protective role in many cancers such as colorectal cancer (CRC). In Saudi Arabia, CRC is considered one of the most common and aggressive tumors in both genders. The effect of four polymorphisms (ApaI, TaqI, BsmI, and FokI) in VDR gene was determined and correlated with the CRC progression. The study was conducted on 132 CRC patients and 124 controls who were recruited from King Abdulaziz University Hospital in Jeddah, Saudi Arabia. The gDNA samples were extracted from peripheral blood cells and genotypes were determined with PCR-RFLP and DNA sequencing. The degree of association ($\chi 2$), odds ratio (OR), risk ratio (RR), and P values were calculated using Hardy-Weinberg equilibrium equation. Results showed that only heterozygous (Aa) for ApaI increased the risk of CRC (OR=2, RR=3, and $P \leq 0.0001$), whereas, for TaqI, heterozygous (Tt) or homozygous (tt) genotype increased the risk of CRC (OR=6, RR=4, and $P \leq 0.0001$; OR=3, RR=2, and P=0.2, respectively). For BsmI, this variant showed a significant reduction in CRC risk for heterozygous (Bb) and homozygous (bb) (P values ≤ 0.0001, respectively). FokI showed no association with CRC risk ($P > 0.05$). The expression of total vitamin D and vitamin D3 in the serum were affected in patients with heterozygous (Aa) genotype for ApaI. In conclusion, the findings provide only limited support for an association between common polymorphisms in VDR and CRC risk. Therefore, more investigations on epigenetic level are required to conclude the probability of using VDR polymorphisms as diagnostic and prognostic markers for CRC.

Biography

Ayat Badr Al-Ghafari, an Associate Professor of Biomedical Sciences at King Abdulaziz University, Jeddah, Saudi Arabia. A member in many local and overseas scientific organizations. I'm interested in applying advanced techniques in genomics and proteomics to study the role of cellular transporters, signaling pathways, and receptors in the pathogenesis of cancer cells, and therefore, to identify biological markers for cancer diagnosis and treatment. Published up to 40 articles in the field of Biochemistry and Cancer Biology particularly colorectal cancer.

Publications

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