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Specific mutations in the X gene of hepatitis B virus: Characterization and impact on disease progression in HBV infected Saudi patients

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Objectives: Hepatitis B virus (HBV) is one of the most widespread human pathogens causing chronic hepatitis, liver cirrhosis and hepatocellular carcinoma (HCC). This study investigated the clinical impact of single and combination mutations in the HBx gene on the pathogenesis of HCC through progressive stages of liver disease and also assessed HBV genotypic variation within the Saudi population.

Methods: Four hundred and twenty four Saudi patients infected with HBV were enrolled in this study. The patients were categorized into inactive HBV carriers (IC), Active HBV carriers (AC), liver cirrhosis (LC) and HCC groups based on disease severity. All the samples were analyzed for mutations in HBx using PCR and direct sequencing.

Results: Male sex, age>50 years and high serum ALT level were found to be associated with risk of progressive liver disease. HBV genotype D was the predominant genotype present among the study group (93%) with sub genotype D1 being the most abundant (62.5%). 78.5% HCC patients were infected with HBV sub genotype D1. Liver cirrhosis was predominantly present in patients with HBV genotype C (66.7%). Mutations I127T, V131I and F132Y/I/R showed a significantly increasing trend with disease progression to HCC. Mutation V88F was present in all the HCC patients. H94Y and K130M were also significantly associated with severe liver disease. One double mutation (K130M+V131I) and two triple mutations (I127T+K130M+V131L and K130M+V131I+F132Y) were observed with significant rising prevalence through progressive clinical phases of liver disease to HCC.

Conclusion: Several single and combinational mutations in the HBx, correlating with severity and progressive clinical phases of HBV infection were identified. The mutational combinations may have a synergistic effect in accelerating progression to HCC. These specific patterns of HBx mutations can prove useful in predicting the clinical outcome of HBV infected patients and may serve as early markers of high risk of developing HCC in the Saudi population.

Biography

Ahmed Al-Qahtani has completed his PhD in Cellular Biology from the University of Georgia, USA in 1996. He is the currently a Senior Scientist and Head of the Molecular Virology Section at the Research Center of King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia. He is a Professor of Microbiology and Immunology at the College of Medicine of Alfaisal University in Riyadh, Saudi Arabia and an Adjunct Associate Professor at College of Medicine of King Saud University in Riyadh, Saudi Arabia. He has published nearly 60 papers in reputed journals in the field of molecular and cellular biology of infectious organisms and serves as a Reviewer for several scientific journals.

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