IMPACT OF HOST GENETIC POLYMORPHISM AT IL-6 GENE PROMOTER AT POSITION -174G/C ON THE OCCURENCE OF HBV AND HCV AMONG HIV/AIDS PATIENTS IN LIMPOPO PROVINCE, SOUTH AFRICA

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Abstract

Background: Chronic Hepatitis B (HBV) and hepatitis C (HCV) viruses are among the most commonly known viruses worldwide. The prevalence rates vary greatly from one region to another and over time, hence surveillance studies are needed to monitor the prevalence patterns of these viruses and to implement appropriate preventive measures. Fortunately, only subsets among acutely infected individuals develop a persistent disease suggesting that genetic susceptibility may influence the establishment of chronicity. Cytokines play an important role in the regulation of the immune response. In hepatitis viral infections, cytokine levels may influence the outcome of infection. Polymorphisms in cytokine genes have also been associated with different expression levels in response to infections. Therefore, the present study aims at investigating the potential impacts of host genetic polymorphisms at IL-6 gene promoter (-174G/C) on the occurrence of HCV and HBV among HIV patients in the Limpopo Province of South Africa.

Methodology: Patients were recruited from different hospitals and clinics from three Districts in Limpopo Province. About 466 blood samples were collected and screened using ELISA for anti-HCVAb and HBsAg. DNA was extracted from buffy coat using the Gen-Elute ^{TM} blood genomic kit from Sigma Aldrich. Genotyping of IL-6 -174G/C was carried out using RFLP-PCR. IL-6 genotyping results were confirmed by sequencing. IL-6 serum levels were measured using commercially available ELISA for human IL-6 from MABTECH. SPSS was used to analyze the results. The results were considered to be statistically significant when the p-value obtained is less than 0.05.

Results: Most of the study participants were females (56.4%). Majority of our study participants were aged between 21 to 45 years (52.4%). About 30% of our study participants had a CD4 cell

count of 251-500. Most of the study participants were from Capricorn district (38.2%). The overall prevalence of HCV and HBV were 15.4% and 20.9% respectively. Highest prevalence of both HCV and HBV was observed in males. The age group >45years had high prevalence of both HCV and HBV although the results was not significant. The infections were not associated with any of the socio-demographic characteristics such as age, gender CD4 cell count an origin. The overall genotypic distribution of IL-6 gene was 35.5% for CC, 24.2% for GC and 18.0% for GG. The genotypes obtained did not show any association with the demographic characteristics within the studied population as well as the reported infections. Participants who were positive for HCV had low levels of IL-6 (81.4%) as compared to those who were HCV negative (72.0%), Participants who were positive for HBV had high significantly levels of IL-6 as compared to those who were HBV negative, the results were statistically significant (**p=0.001**).

Conclusions: The present study demonstrated a high prevalence of both HCV and HBV in the Limpopo Province. The prevalence was higher in males than in females for both HCV and HBV. Both infections were high in participants with age group >45 years. IL-6 -174G/C polymorphism did not show any association with either infection, suggesting that the polymorphism might not have an impact on the occurrence of the reported infections. The higher prevalence was observed among males, which calls for an urgent need for males to be screened for STI's and campaigns for males to use condoms if they have multiple partners.

Key words: Interleukin-6, HCV and HBV