ABSTRACT

Globally, it is estimated that 1.2 million injecting substance users are HBV infected while 1.7 million live with HIV. Africa is home to about 1.02 million injecting substance users of whom 12.7% are HBV infected while 12.1% live with HIV. In Kenya, the population of injecting substance users is approximately 50,000 most of whom reside in Nairobi and Mombasa cities. Nairobi and Mombasa cities are home to about 23,000 and 27,000 injecting substance users, respectively. The prevalence of HBV infection among injecting substance users is 3% in Nairobi city and 13.8% in Mombasa city. In addition, HIV prevalence in injecting substance users is 18.7% in Nairobi city and 43.9% in Mombasa city. HBV diagnosis and clinical staging requires concurrent testing of hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (HBsAb), hepatitis B pre-core antigen (HBeAg), hepatitis B pre-core antibody (HBeAb) and hepatitis B core antibody (HBcAb). HBV exist as ten genotypes (A to J) which vary by geographic area. HIV infection alters host response to HBV leading to significant variations in the pattern of HBV sero-markers, clinical stages and genotypes. In addition, injecting substance use alters host immune response by reducing CD4+ T cell proliferation. HBV sero-markers, clinical stages and genotypes have been determined in HIV-1 infected injecting substance users in Mombasa city, Kenya. However, comparison of HBV sero-markers, clinical stages and genotypes between HIV-1 infected and uninfected injecting substance users in Mombasa city, Kenya, remains unknown. This study, therefore, compared HBV sero-markers, clinical stages and genotypes between HIV-1 infected (n=157) and uninfected (n=214) injecting substance users in Mombasa city, Kenya. In a cross-sectional study, the injecting substance users were recruited via snowball method and their socio-demographic data recorded on questionnaires. The CD4+ T cells were enumerated using flow cytometer and categorized according to the Centre for Disease Control and Prevention immunological staging criteria. Plasma samples were sero-tested for HBsAg, HBsAb, HBeAg, HBeAb and HBcAb using the HBV-5 panel rapid test cassettes. Clinical staging was based on serological profile of the five HBV sero-markers. Phylogenetic analysis was used to determine HBV genotypes in acute and chronic clinical stages. Age and CD4+ T cell count were compared between the study groups using Mann-Whitney U test. Gender, CD4+ T cell immunological stages and HBV sero-markers were compared between the study groups using Chi-square test. HBV clinical stages and genotypes were compared between the study groups using Fisher's exact test. The frequency of HBsAg (P=0.004) and HBcAb (P=0.008) sero-markers were higher while that of HBsAb (P=0.019) sero-marker was lower in HIV-1 infected group compared to the uninfected group. The frequency of acute (P=0.033) and chronic (P=0.021) clinical stages were higher while that of vaccine type response stage (P=0.008) was lower in the HIV-1 infected group compared to the uninfected group. Only HBV genotype A clusters was detected, with higher frequency in the HIV infected group compared to uninfected group (P=0.009). In conclusion, HBsAg and HBcAb sero-markers and acute and chronic clinical stages are higher while HBsAb sero-marker and vaccine type response clinical stage are lower in HIV-1 infected compared to uninfected injecting substance users in Mombasa city. In addition, genotype A clusters is higher in HIV-1 infected compared to uninfected injecting substance users

in Mombasa city. Therefore, HIV-1 infected injecting substance users in Mombasa city should be vaccinated against HBV. Medical follow-up programmes and harm reduction measures should be initiated to lower the burden of HBV infection and transmission among HIV-1 infected injecting substance users in Mombasa city.