Incidence of occult hepatitis B virus among people living with HIV in Botswana

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Background: Hepatitis B surface antigen (HBsAg) is a routine diagnostic hepatitis B virus (HBV) marker. HBsAg-negative, HBV DNA-positive occult HBV (OBI) is often missed by this approach. OBI is transmissible, can cause liver disease, and is common among people with HIV (PWH). There are limited data on the natural progression of OBI due to limited longitudinal studies of OBI, therefore we determined the incidence and risk factors for OBI in PWH in Botswana.

Methods: Plasma samples from two longitudinal HIV natural disease progression studies at the Botswana Harvard AIDS Institute Partnership which followed participants for at least 24 months from 2004 to 2009 were used. Participants with available follow-up plasma samples were selected for HBsAg testing by enzyme-linked immunosorbent assay (ELISA). HBsAg negative samples were screened for OBI using an in-house real-time polymerase chain reaction assay. We estimated OBI incidence with 95% confidence interval (CI). Risk factors for OBI were assessed using Cox proportional hazards regression analysis.

Results: At baseline, HBsAg prevalence was 2.1% (8/382), while OBI prevalence was 14.7% (11/75). A total of 90 participants were used in the OBI incidence estimates throughout the follow-up period. Ninety participants were utilized to estimate OBI incidence over the entire follow-up period. Approximately 80% (72/90) were female, and 59% (43/73) had positive anti-HBc serology. Participants contributed 128.82 person-years to the study and were followed for a median of 1.02 years (IQR: 1.00-2.00). Cumulatively, there were 34 incident OBI cases, giving an incidence rate of 26.4/100 person-years (95% CI: 18.9 – 36.9). The median time to incident OBI was 372 days (IQR: 365 – 730). Incident cases had slightly lower median CD4+ T-cell count compared to participants without OBI (p= 0.05). Being male was independently associated with a significantly higher risk of OBI [adjusted Hazard Ratio (aHR) = 3.5 (95% CI: 1.62-7.46); p=0.001]. Every unit increase in CD4 cell count was associated with a lower risk of incident OBI (aHR=0.41; 95%CI:0.19 -0.89; p=0.02).

Conclusions: There was a high OBI incidence in PWH in Botswana, especially in males and immunocompromised participants. OBI screening in PWH should be considered because of the risk of transmission and reactivation.

Ethical research declaration: Yes

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