

Abstract:

HIGH RESOLUTION INSIGHT INTO HEPATITIS B VIRUS EPIDEMIOLOGY IN AFRICA TO INFORM ON INTERVENTION STRATEGIES

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Introduction: Hepatitis B virus (HBV) prevalence varies considerably between settings on the African continent. Reasons for these differences remain poorly understood, as does their impact on intervention strategies. Most studies on chronic HBV infection (CHB) focus on the viral surface antigen (HBsAg), a biomarker of active infection. Given the high rates of natural clearance (>90% in immunocompetent adults), the prevalence of immunity could also inform intervention strategies.

Aim: We examined the relationship between HBV exposure and CHB in Africa and explored the extent to which this information can be used to infer transmission patterns and plan interventions.

Methods: We defined exposure (conferring immunity) to HBV as HBV core antibody (anti-HBc) positive and HBsAg negative. In June 2018, we systematically searched public databases using PRISMA guidelines to identify publications from adult African cohorts that included data for both anti-HBc and HBsAg prevalence. We used the United Nations geoscheme to define a list of African nations and to classify the continent into Northern (NA), Southern (SA), Western (WA), Eastern and Central Africa (CA).

Results: In total, we identified 89 studies spanning 65% African nations. Across Africa, HBsAg prevalence is positively correlated with total anti-HBc, $p < 0.0001$. Anti-HBc prevalence was $\geq 70\%$ in 24% studies, indicating high exposure to HBV. WA had the highest prevalence of both HBsAg and anti-HBc positivity, and the lowest in NA. We observed a two-fold difference in HBsAg prevalence between NA and SA ($p = 0.04$) without any significant change in anti-HBc prevalence ($p = 0.99$). CA was the only region where there was no correlation between HBsAg and anti-HBc ($p = 0.99$).

Conclusion: We identified distinct regional associations between chronic HBV infection and exposure in Africa. Factors including age at exposure, route of infection, host genetics and viral genotype, are likely underestimated determinants of CHB prevalence in Africa.

We suggest that regions with high HBsAg and comparatively low anti-HBc prevalence, may benefit most from antenatal screening and intervention, as vertical transmission may be driving the high CHB rates. Populations with high anti-HBc prevalence have a low proportion of susceptible individuals, and 'catch-up' vaccination initiatives may not be effective long-term in such populations.