

A case-control study for differences among hepatitis B virus infections of genotypes A (subtypes Aa and Ae)

Tanaka, Y; Hasegawa, I; Kato, T; Orito, E; Hirashima, N; Acharya, KS; Gish, RG; Kramvis, A; Kew, MC; Yoshihara, N; Shrestha, SM; Khan, M; Miyakawa, Y; Mizokami, M

Date: 2004

Abstract:

There are two subtypes of hepatitis B virus genotype A (HBV/A) and they are provisionally designated Aa ("a" standing for Africa/Asia) and Ae ("e" for Europe). In a case-control study, 78 HBV/Aa, 78HBV/Ae, and 78HBV/D carriers from several countries were compared. The prevalence of HBe antigen (HBeAg) in serum was significantly lower in carriers of HBV/Aa than in carriers of HBV/Ae (31% vs. 49%; $P = .033$), with a difference more obvious in the carriers aged 30 years or younger (34% vs. 67%; $P = .029$). HBV DNA levels in the carriers of HBV/Aa (median, 3.46 log copies/mL; 95% CI, 2.93-3.95) were significantly lower than those of carriers of HBV/Ae (6.09 log copies/mL; 95% CI, 4.24-7.64) or of carriers of HBV/D (5.48 log copies/mL; 95% CI, 4.06-7.02), regardless of the HBeAg status ($P < .001$). The most specific and frequent substitutions in 54 HBV/Aa isolates were double substitutions for T1809 (100%) and T1812 (96%) immediately upstream of the precore initiation codon, which would interfere with the translation of HBeAg in HBV/Aa infections. They were not detected in 57 HBV/Ae or 61 HBV/D isolates examined. The double mutation in the core promoter (T1762/A1764) was more frequent in both HBV/Aa (50%) and HBV/Ae (44%) than in HBV/D isolates (25%; $P < .01$), whereas the precore mutation (A1896) occurred in HBV/D isolates only (48%; $P < .0001$). In conclusion, the clearance of HBeAg from serum may occur by different mechanisms in HBV/Aa, HBV/Ae, and HBV/D infections, which may influence clinical manifestations in the Western countries where both genotypes A and D are prevalent. Copyright 2004 American Association for the Study of Liver Diseases