

Prevalence of hepatitis delta antibody among HBsAg carriers in Saudi Arabia

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Background: There are a paucity of data available on the exact prevalence of delta hepatitis among HBsAg positive carriers in Saudi Arabia. The aim of this study was to determine the exact prevalence of delta antibody in HBsAg positive carriers in Saudi Arabia.

Patients and Methods: Between January 1996 and January 1997 the serum of 19 250 patients was tested for HBsAg. HBsAg positive sera were subsequently tested for delta antibody. In addition, 3147 healthy blood donors underwent HBsAg testing. Those who were HBsAg positive had delta antibody testing using the ELISA method.

Results: Among 19 250 patients, 780 (4.1%) were HBsAg positive, of which 67 (8.6%) patients were anti-delta positive and 2 (0.25%) were anti-delta borderline. Among 3147 healthy donors, 60 (1.9%) were HBsAg positive with 2 (3.3%) being delta antibody positive.

Conclusions: The prevalence of delta antibody among hospital- and clinic-based HBsAg positive patients was 8.6% and among healthy blood donors who were HBsAg positive, the prevalence was 3.3%. Furthermore, delta antibody prevalence was 0.06% for "all comers", i.e., healthy blood donors. With decreasing hepatitis B prevalence as a result of universal vaccination, it is expected that delta hepatitis infection among Saudis will decrease with time.

Key words: Hepatitis D virus, Hepatitis B virus, Saudi Arabia

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*Accepted for publication:
July 2004*

Ann Saudi Med 2004; 24(5): 343-344

Hepatitis delta virus infection (HDV) is an important health issue in patients who are hepatitis B virus carriers and those who develop hepatitis B virus and hepatitis D virus co-infection. This study has been done to determine the exact prevalence of hepatitis D virus infection among HBsAg positive carriers in Saudi Arabia. There are two published delta studies in Saudi Arabia.^{1,2} The prevalence rate was from 22.2% to 17.6%. The aim of this study was to determine the exact prevalence of delta antibody in large numbers of sera tested during a one-year period, especially after the start of the HBV vaccination programme, which was initiated in 1989 in Saudi Arabia.

Patients and Methods

In this prospective study conducted between January 1996 and January 1997, 19 250 persons were tested for HBsAg at King Abdulaziz Medical City, King Fahad National Guard Hospital Riyadh, National Guard Primary Care Centres and Polyclinics by using AxSYM HBsAg (v2) based on Microparticle Enzyme Immuno Assay (MEIA) (Abbott Laboratories, USA). Afterwards, those who were HBsAg positive were subjected to delta antibody (IgG) testing by using the Abbott anti-delta EIA.

Results

Of 19 250 patients, 780 (4.1%) were found to have a HBsAg positive result and of those sera, 67 (8.6%) were positive for delta antibody and 2 (0.25%) had borderline delta antibody. Among the other group of 3147 healthy potential blood donors, 60 sera (1.9%) were positive for HBsAg and 2 (3.3%) were delta-antibody positive. The prevalence of delta antibody among hospital- and clinic-based HBsAg positive patients was 8.6% and among HBsAg positive healthy blood donors was 3.3%, respectively. Therefore, delta antibody was present in 0.06% of "all comers", i.e. healthy blood donor volunteers.

Discussion

HDV was mentioned in the medical literature about four decades ago,³ but was not identified until 1977⁴ by immunofluorescent staining of liver tissue from patients with chronic hepatitis due to persistent HBV infection. HDV is a distinct, defective and highly infectious virus. It is a 23 to 25 nm intranuclear or cytoplasmic transmissible pathogenic RNA particle, which requires the helper or rescue function of HBV for its expression and replication in human beings. It can be transmitted to HbsAg-positive experimental animals.⁵ Assays for the detection of HDV-antigen are not

Table 1. Epidemiological studies of hepatitis D infection in Saudi Arabia.

Study	Sample Size	Prevalence	Comments
El Hazmi, 1986 (11)	488	22.2%	Small study, before hepatitis B virus vaccination programme
M Masood, 1991 (12)	212	17.6%	Small study, before hepatitis B virus vaccination programme
Al Traif (present study)	780	8.6%	Large study after institution of hepatitis B vaccination programme

available, but HDV antibody, also called delta antibody (IgM, IgG) can be detected by immunofluorescence or immunoperoxidase techniques. In humans, HDV infection may result from a co-infection associated with HBV infection or a superinfection in a pre-existing HBsAg positive patient. When associated with the co-infection, it can lead to acute hepatic failure and, when associated with superinfection, to chronic liver disease.⁶ An HBsAg positive carrier may change into HBsAg negative when superinfection with delta virus occurs. This is believed to be the result of an inhibitory effect of HDV on the replication of HBV.⁷ HBsAg positive patients with HDV infection may go into hepatic failure and develop hepatocellular carcinoma as delta infection in HBV carriers is associated with more active and progressive disease, as suggested by clinical and histological evidence of high liver enzymes and a faster rate of developing cirrhosis.⁸ The prevalence of HDV infection varies throughout the world and is more common in the Western population as compared to Asians. However, it is reported to be endemic in Northern India⁹ and Egypt.⁷ HDV infection is more common in intravenous drug users¹⁰ and hemophiliacs.¹¹

In 1986, an epidemiological study of HDV infection among HBsAg positive subjects found a variable prevalence in Saudi Arabia.¹ The prevalence was 22.2% in patients

with chronic hepatitis in the Riyadh area, with an anti-delta prevalence of 7.9% and 6.7% in active hepatitis B virus and HBsAg positive carriers, respectively. The prevalence of anti-delta among HBsAg positive carriers in Saudi Arabia, as in the Al Hafuf and Najran Regions was found to be 5.3% and 9.6%, respectively. El-Hamzi and Ramia suggested that HDV infection was more prevalent in certain regions of Saudi Arabia and was transmitted parentally.¹ Masoud et al reported a 17.6% prevalence of HDV infection in HBsAg positive carriers in Saudi Arabia.² In this study, the prevalence of anti-delta in HbsAg positive carriers was 8.6%.^{1,2} (Table 1). Our results differ due to the greater number of subjects (19 254) in our study, the difference in the time period during which these studies were conducted, the methods used in our study (ELISA), which are more sensitive than the EIA and RIA methods used in the other two studies, increased public awareness, and the HBV vaccination programme.

It is likely that the decreasing prevalence of HBV infection is due to the HBV vaccination programme, which started in 1989 in Saudi Arabia. We expect that the prevalence of HDV infection will decrease further in the future as vaccination against hepatitis B virus will result in limiting further spread.

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