

Short Communication

Serological survey of HDV-Ab in HBsAg positive blood donors in Shahrekord, Iran

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Hepatitis delta virus (HDV) is a defective ssRNA virus requiring the provision of hepatitis B virus (HBV) for packaging of new HDV virions. Since the epidemiological features of HDV in this part of Iran seem to be unknown, the aim of this research was to determine the seroprevalence of HDV in HBsAg positive blood donors, in Shahrekord, Iran. In this research, we announce the detection of HDV-Ab from HBsAg positive blood donors in Shahrekord by ELISA. Of the 90 HBsAg positive volunteer blood donors admitted to Shahrekord blood transfusion organization center in Iran during 2006 to 2008, 2 specimens were positive for HDV-Ab. So, the rate of HDV-Ab was determined 2.2%.

Key words: Blood donors, HBsAg positive, hepatitis D, Iran, Shahrekord.

INTRODUCTION

Hepatitis B is one of the most common infectious diseases; around 400 million people are chronically infected with hepatitis B virus (HBV) worldwide. Over 15 million people are infected with hepatitis D virus (HDV) (Farci et al., 2006; Dehesa et al., 2007). In the Middle East, HBV infection shows an intermediate rate, varying between 2 and 7% in different countries (Qirbi et al., 2001). In Iran, it is estimated that over 35% of population have been exposed to the virus and about 2.5% of population are hepatitis B chronic carriers ranging between 1.3 and 8.7% in different provinces of Iran (Merat et al., 2000). After the national HBV vaccination programme for neonates in 1993, Iran can be considered one of the countries with low HBV infection endemicity.

HBV is the major cause of liver disease and hepatocellular carcinoma (HCC) (Rizzetto et al., 1980; Shamszad et al., 1982; Bagheri et al., 1999).

HDV is a defective ssRNA virus, in which HBV surface proteins are needed for packaging of new HDV virions, it is usually studied in hepatitis B surface antigen-positive patients. HDV infection is endemic in the Middle East countries. In Iran, delta virus infection is reported in 5.6% of patients with chronic hepatitis B infection (Alavian et al., 2005). Hepatitis B, C and D viruses are potentially dangerous complications of transfusion therapy. Although, effective serologic and molecular screening tools are employed to detect transfusion transmitted agents among healthy blood donors, the transmission risk remains (Liuc et al., 2006). Seroepidemiological studies revealed different rates of HBV, HCV and HDV infection in healthy blood donors in different provinces of Iran.

Acute and chronic liver diseases have been reported in

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Table 1. Positivity of HBsAg and HDV- Ab from Shahrekord blood donors.

Characteristics	HBsAg positivity	HDV-Ab positivity
Male/female	80/10	2/0
Married/unmarried	30/60	1/1
Tattooing/untattooing	65/25	0/2
Sexual contact/no sexual contact	40/50	0/2

patients infected with HDV. It is estimated that more than 15 million patients are infected with HDV. The incidence of HDV infection in the western regions of Asia, Eastern Europe and Italy is high, in comparison with the rest of the world (Faustini et al., 1991). HDV has been reported to be endemic in the Middle East. A considerable body of evidence now suggests that simultaneous infection with HDV leads to an acceleration of the progress of chronic HBV infection into chronic hepatitis, cirrhosis and finally, hepatocellular carcinoma. It has also been reported that co-infection or super-infection with HDV may occur in 25% of chronic HBV carriers. Only 15% of infected patients with HBV develop cirrhosis in comparison to 70 to 80% of HDV-infected patients who develop cirrhosis (Stephan et al., 2000).

MATERIALS AND METHODS

Serum sampling

In this research, 90 serum samples of HBsAg positive blood donors admitted to Shahrekord blood transfusion center in Iran were tested by ELISA. Hepatitis B surface antigen (HBsAg) was determined using commercially available Enzyme linked Immuno Sorbent Assay (ELISA) kits (Enzygnost HBsAg 5.0 DADE BEHRINC). HBsAg positive samples were tested for detect (IgG) HDV-Ab.

To detect (IgG) HDV-Ab from HBsAg positive blood donors, we used (ELISA) kits (DIA-PRO, Italy). And for detecting HDV-Ab, we used GOT/GPT kit (Zist shimi).

RESULTS

The base-line characteristics of subjects were shown in Table 1. From 90 HBsAg positivity subjects, 2 (2.2%) specimens were positive for anti- HDV Ab. Of 90 HBsAg positive blood donors, 80 cases were male, 10 cases were female, 30 cases were married, 60 cases were unmarried, 65 cases had a history of tattoo, 25 cases had no history of tattoo, 40 subjects had history of sexual contact and 50 subjects had no history of sexual contact.

From 80 HBsAg positive male s blood donors, 2 samples were positive for anti-HDV Ab but there was no anti-HDV Ab positive samples from 10 female's subject. From 30 married HBsAg positive blood donors, 1 subject was positive and from 60 unmarried HBsAg positive blood donors, 1 sample was positive for anti-HDV Ab. In the 65 cases with a history of tattoo, there was no

serum sample positive for anti-HDV Ab, but from the 25 cases with no history of tattoo, 2 samples were positive for anti-HDV Ab. From the 40 subjects who had history of sexual contact, there was no serum sample positive for anti-HDV Ab, but from the 50 cases without a history of sexual contact, 2 samples were positive for anti-HDV Ab.

The study of serum ALT levels in HBV-positive and HDV positive patients showed obvious elevation in the positive cases.

DISCUSSION

HDV infection occurs worldwide but, incidence and prevalence data are limited in many parts of the world due to inaccurate reporting and delayed detection. The epidemiology of HDV infection is similar to HBV (Alavian et al., 2005). Despite considerable advances in medical technology to cure the disease, viral hepatitis still remains a major public health problem with its worldwide high morbidity and mortality. Around one million people die each year of HBV infection, making it the 9th leading cause of death worldwide. It has been estimated that over 35% Iranians have been exposed to the HBV and about 3% were chronic carriers (Boag et al., 1991).

It is estimated that approximately 5% of HBsAg carriers are infected with HDV infection. The infection was endemic in the Mediterranean basin, the Middle East and parts of Africa. However, the rate of HDV infection has decreased in Iran due to the introduction of HBV vaccination, the subsequent decrease in HBV infection and thus in the pool of HBsAg carriers who may be infected with HDV. Socio-economic improvements and measures introduced to control the human immunodeficiency virus (HIV) are also responsible for this decrease. Nonetheless, it continues to represent a public health problem in some parts of the world yet (Alavian et al., 2007).

We conducted an epidemiological study of 90 HBsAg positive blood donors during 2006 to 2008, collected from blood transfusion organization, Shahrekord, Iran. In this research, we have understood that the seropositivity of anti-HDV antibodies was 2.2%, showing the endemicity of HDV infection in Shahrekord.

HDV has a widespread geographic distribution with two predominant patterns of transmission. In endemic areas, such as Southern Italy, parts of Africa and South

America, transmission is thought to occur through person-to-person contacts in the absence of overt percutaneous exposure. In contrast, in Western Europe and the United States, HDV infection has been confirmed to groups with frequent percutaneous exposure (Faustini et al., 1991).

There is little data available regarding the routes of HDV transmission in Iran. The predominant routes for the transmission of HBV in Iran were maternal, from infected mothers to infants and horizontal, during childhood. The epidemiology of hepatitis B has changed in Iran and horizontal transmission in adults is increasing. The risk factors for acquiring HDV infection in some studies in Iran are blood transfusion, surgery, family history, Hejamat (traditional phlebotomy), tattooing, war injury, dentistry interventions and endoscopy (Alavian et al., 2005, 2007).

There are data from different parts of the country reporting different prevalence rates. Statistical analysis by SPSS, Version 13 and with the Fisher test, did not show significant statistical relationships between the sex (P value=0.789), married spouse (P value = 0.558), tattooing precedence (P value = 0.075) and sexual contact (P value = 0.306) with HDV-Ab positivity.

The prevalence of HDV infection among the HBsAg positive population has been a variable, for example, Rezvan et al. (1986, 1988) in Tehran, Malekzadeh et al. (1989) in asymptomatic hepatitis B carriers in Shiraz, Taghavi et al. (2008) in Shiraz, Karimi et al. (2000) in Tehran, Roshandel et al. (2007), in Golestan, Hassanjani et al. (2002) in Babol, Torabi et al. (2000) in Tabriz, and Zahedi et al. (2003) in Kerman, reported; 44.5, 13.9, 9.7, 1.3, 5.8, 2, 6.15 and 20.7% HDV-Ab positivity from HBsAg positive blood donors, respectively.

The prevalence of HDV infection among the HBsAg positive population in the other countries is variable, for example, 24.4, 16.6, 4, 2.2, 1.6, and 1.5%, in Bangladesh, Pakistan, Mexico, Taiwan, Spain, and Yugoslavia, respectively (Jedary et al., 2010).

In conclusion, HDV infection is a widespread disease that has affected a large number of HBV infected population in Iran and is considered to be a major public health problem in our country. Heterogeneous patterns of geographic distribution of HDV infection throughout the country indicate that the risk factors of HDV infection may differ in different regions of the country and that comprehensive surveys in HBV infected patients should be conducted in the country to investigate the risk factors and the prevalence rate of infection

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