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Abstract

Background: The detection of hepatitis B surface antigen positivity in pregnant women before delivery is crucial to preventing mother-to-child transmission of hepatitis B virus.

Aims: This study aimed to evaluate the status and rate of testing for hepatitis B surface antigen, rate of hepatitis B surface antigen positivity, hepatitis B surface antigen positivity distribution rate by age, and changes in hepatitis B surface antigen positivity rate in pregnant women over the study period.

Methods: We conducted a multicentre, cross-sectional, descriptive study covering the period January 2005 to June 2019 for 2 145 668 pregnant women from 27 provinces in all 7 regions of Turkey, collected using Microsoft Excel before statistical analysis.

Results: We found that 1 012 593 (47.1%) pregnant women were tested for hepatitis B surface antigen over the 15-year period, out of which 11 471 (1.1%) were hepatitis B surface antigen-positive. Overall, 97% of the hepatitis B surface antigen positive women were born before 1998, the year that national HBV vaccination was launched in Turkey. The rate of hepatitis B surface antigen positivity in that group was 1.1%, compared with 0.3% among women born after 1998.

Conclusion: There was a downward trend in the hepatitis B surface antigen positivity rate among pregnant women in the younger age groups, especially among those born after universal hepatitis B vaccination was inaugurated, and low rate of HBsAg testing during pregnancy.

Keywords: HBsAg positivity, pregnancy, vaccination, women Turkey

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Introduction

Worldwide, approximately 90% of people with chronic hepatitis are not aware of their illness (1). They may consequently spread the hepatitis B virus (HBV) to others and experience progression of the disease. Perinatal exposure is a significant mode of HBV transmission, resulting in chronic disease in approximately 90% of infected infants. Exposure to HBV in infancy or early childhood is associated with an increased risk of developing cirrhosis and hepatocellular carcinoma (1,2). It is, therefore, crucial to notify HBsAg positive pregnant women and take necessary precautions to prevent mother-to-child transmission of HBV. These precautions include routine prenatal screening for HBsAg in combination with the administration

of hepatitis B hyper immunoglobulin (HBIG) within the first 12–24 hours after delivery, followed by HBV vaccination of infants born of HBsAg positive mothers (3–5). Despite adequate prophylaxis with hepatitis B vaccination and HBIG, HBV transmission may occur at a rate of 5–10% in infants of HBeAg-positive mothers with a detectable HBV DNA level > 10 IU/mL (6,7). Some strategies, especially therapy with antiviral drugs, are therefore recommended in those with high viral load during pregnancy to reduce the amount of virus (viral load) in the blood. This strategy is essential to protect unborn babies from mother-to-child transmission (1,6–8).

Nowadays, even in most countries where HBV is endemic, HBsAg screening using an ELISA test during pregnancy is far below desirable levels. The US Centers for Disease Control and Prevention recommends that each pregnant woman should be tested for HBsAg during the first prenatal visit in each pregnancy and further recommends HBsAg testing for all pregnant women, even if they had been previously vaccinated or tested (9–12).

The recommendations on the necessity of testing for HBsAg in pregnancy were first defined in Turkey in the antenatal care guidelines published by the Ministry of Health in 2014 (13). A considerable lack of knowledge or awareness of this guideline among physicians led to poor compliance with screening for HBsAg and insufficient requests for HBsAg testing during pregnancy; HBsAg testing, therefore, could not be done among pregnant women at the desired levels throughout the country. There was no legal obligation in Turkey to screen pregnant women for HBsAg during pregnancy until 2018. Thus, until 2018 physicians tested pregnant women for HBsAg only as a recommended option (13).

Turkey is among the moderately endemic countries in terms of HBV, located in the European continent and adjacent to the Asian continent. Its universal HBV vaccination programme started in 1998. Adolescent vaccination campaigns (catch-up campaigns) were carried out in schools between 2005 and 2009. Health workers and adults in the high-risk group are vaccinated free of charge by the Ministry of Health. Children born in 1998 and 1999 who were vaccinated at birth were revaccinated during the catch-up campaign. Catch-up vaccinations have not been administered since 2000. Within the scope of safe injection practices, the use of disposable syringes started in 1985 and safe blood transfusion practices are carried out meticulously. For this reason, the incidence of acute HBV cases in Turkey has decreased over the years, and chronic HBV infection has decreased significantly, especially in children and adolescents (14).

The World Health Organization initiated a programme (the Global Health Sector Strategy) to eliminate viral hepatitis throughout the world by 2030 and to reduce the number of cases and the number of deaths due to this disease (2). In compliance with this programme, the Turkish Ministry of Health created and implemented the Chronic Viral Hepatitis Prevention and Control

Programme in October 2018 (14). The programme made it legally obligatory for physicians to order HBsAg testing during pregnancy for all pregnant women, in addition to adopting the strategies included in the Global Health Sector Strategy in Turkey (14).

Since implementation of this programme just began in Turkey, this study assessed the rates of HBsAg screening in pregnant women and the situation before the programme started. We conducted this study to determine the changes in the status and rate of testing for HBsAg and the HBsAg positivity rate among pregnant women during 2005–2019. We especially wanted to do this before the implementation of the Viral Hepatitis Prevention and Control Programme, which will continue for 5 years (14).

Methods

Study design

We performed this multicentre, retrospective, cross-sectional study between 1 July 2019 and 1 July 2020; the data included in the study were obtained between 2005 and 2019. We created an Excel form and sent it to all health centres, followed by the agreement of the centres to participate in the study. Data were collected from 50 primary, secondary and tertiary health centres in 27 of the 81 provinces in Turkey (Adana, Aksaray, Ankara, Antalya, Batman, Çanakkale, Denizli, Edirne, Gaziantep, Giresun, Hatay, Iğdır, İstanbul, İzmir, Kahramanmaraş, Kars, Kütahya, Manisa, Mersin, Muş, Rize, Şanlıurfa, Şırnak, Tekirdağ, Trabzon, Uşak, Yozgat), distributed throughout the country.

Each participating centre recorded its data in the Excel form and sent it to our centre for each year. The data included: the number of pregnant women admitted to the centres, number of pregnant women tested for HBsAg, number confirmed to be HBsAg-positive and the birth dates of the pregnant women.

We subsequently stratified the data for HBsAg-positive pregnant women by age group and year and analysed the data in terms of the annual rate of HBsAg positivity. The pregnant women in our study were divided into 5-year age groups. Since the mothers who were born in 1998 and 1999 were revaccinated in the catch-up campaign, these and the other mothers who were born in 2000 and after (who were vaccinated at birth only) were evaluated in separate groups. We evaluated all of the data separately for each institution per year of the study. The study physician responsible for each centre deleted duplicate records. The patients' data were anonymized under the privacy policy to prevent disclosing personal information. We recorded only the initial letters of the first and last names, date of birth and test results in the Excel form before sending the data for statistical analysis.

Statistical analysis

The data were analyzed using the JASP software, version 9.2.0, using descriptive statistical methods (number, percentage, frequency). Simple linear regression analysis was performed to determine changes in the rate of HBsAg positivity over time. P