SEROPREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG PREGNANT WOMEN IN RURAL BASED TEACHING HOSPITAL OF NORTHERN MAHARASHTRA, INDIA

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ABSTRACT
Background: Hepatitis B virus infection is an important global health problem and India accounts for 10–15% of the entire pool of HBV carriers of the world. Hepatitis B virus infection during pregnancy is associated with a high risk of maternal complications and has been reported as a leading cause of maternal mortality. Furthermore, the strong possibility of vertical transmission lends importance to diagnosing acute or chronic hepatitis B virus infection in pregnant women and justifies mandatory antepartum serum HBsAg screening.

Aims & Objectives: This study aimed to determine the seroprevalence of hepatitis B surface antigen among pregnant women.

Materials and Methods: The present retrospective hospital record-based study was conducted at the rural tertiary care teaching hospital in northern Maharashtra, India, over a period of 4 & 1/2 years, from January 2010 to June 2014. The screening for HBsAg, in all the serum samples collected from pregnant women, was performed using commercial kit based on the ELISA (Span Diagnostic Ltd, Surat, India), as per the manufacturer's instructions. The data of those, who were found to be positive for HBsAg, was statistically analyzed with chi square test, and results were considered significant, if P value was < 0.05.

Results: The overall seroprevalence rate was 1.15% among the total 1815 pregnant women included in this study. The correlations of seroprevalence rate of HBsAg among selected age groups and according to trimester of pregnancy were found to be statistically insignificant.

Conclusion: The seroprevalence rate 1.15% of HbsAg in this study, recommends further reintensification of the mandatory screening of pregnant women for HbsAg during antenatal period, health education in particular, about modes of transmission of hepatitis B virus, and appropriate interventional measures to prevent vertical transmission in neonate.

Key Words: Hepatitis B Surface Antigen (HBsAg); Pregnant Women; Perinatal Transmission; Seroprevalence

Introduction

Hepatitis B virus infection is an important global health problem and India has over 40 million hepatitis B virus carriers accounting for 10–15% of the entire pool of HBV carriers of the world.[1] It is generally accepted, that the modality of transmission of hepatitis B virus in India is horizontal. However, the recent report of Dwivedi et al,[2] showing a high prevalence of replicative markers in India, suggest that there may be a significant role of vertical transmission as well. The significance of hepatitis B virus infection during pregnancy, derives in major part from its potential to be transmitted vertically.[3] Hepatitis B virus infection during pregnancy, is associated with a high risk of maternal complications, and has been reported as a leading cause of maternal mortality.[4] Ten percent of infants born to women with acute HBV infection, during the first trimester of pregnancy, are HBsAg positive at birth, and 80 to 90% of neonates become HBsAg positive without prophylactic therapy, if acute maternal infection develops during the third trimester of pregnancy.[5,6] This strong possibility of vertical transmission, lends importance to diagnosing acute or chronic hepatitis B virus infection in pregnant women, and justifies mandatory antepartum serum HBsAg screening.[7] By doing so, previously unsuspected chronic hepatitis B virus infection is diagnosed in young, otherwise healthy, individuals. This has the added benefit of making it possible to refer them for appropriate antiviral therapy, before the development of significant liver damage and associated functional insufficiency. The prenatal screening of all pregnant women for HBsAg, helps to determine morbidity and mortality due to hepatitis B virus infection in pregnant women, and its effect on parturition. Furthermore, it also aids in reducing the incidence of perinatal transmission of hepatitis B virus, and formulating hepatitis B immunoprophylaxis to all new born infants of hepatitis B surface antigen positive mothers. Due to paucity of such type of study in this region of Maharashtra, the present study aimed to determine the seroprevalence of hepatitis B surface
antigen among pregnant women.

Materials and Methods

The present retrospective hospital record-based study was conducted at a rural tertiary care teaching hospital in northern Maharashtra, India. Data was collected over a period of 4&1/2 years from January 2010 to June 2014. In this period, total 1815 women, in any trimester of pregnancy, with or without jaundice, and attending the antenatal clinic, were subjected to the study. After a complete general, systemic and obstetrical examination, blood samples were collected from pregnant women, after informed consent. The screening for HBsAg in all the serum samples collected, was performed using commercial kit based on the ELISA (Span Diagnostic Ltd, Surat, India), as per the manufacturer’s instructions. Those found to be positive, were retested, and if found positive again, were declared HBsAg positive. The data of HBsAg was statistically analyzed with chi square test, and results were considered significant if P value was < 0.05.

Results

In total 1815 pregnant women included in the present study, the overall seroprevalence of HBsAg was found 1.15% (Table 1). In regards to the seroprevalence of HBsAg in pregnant women, according to the included age groups, the highest seroprevalence rate of 1.87% was found in the age group of 20-24 years, and lowest of 0.45% in age group of 15-19 years (Table 1). However, the seroprevalence of HBsAg in pregnant women, according to the age groups association, was not found significant statistically (P>0.05).

| Table-1: Age group wise HBsAg seropositivity in pregnant women |
|--------------------------|----------------|----------------|
| Age Group (Years)        | Total | HBsAg Positive |
| 15-19                    | 222   | 01              |
| 20-24                    | 588   | 11              |
| 25-29                    | 520   | 06              |
| 30-34                    | 337   | 02              |
| 35-39                    | 105   | 01              |
| 40-45                    | 43    | 00              |
| Total                    | 1815  | 21              |

The HBsAg seropositivity in different trimester of pregnancy, showed the increasing trend from first to third trimester of pregnancy, and highest seroprevalence of 1.50 % (14/928) was found during third trimester of pregnancy (Table 2). The significant statistical association was not found between samples screened in different trimesters of pregnancy with HBsAg positivity (P>0.05).

Discussion

The prevalence of HBsAg varies widely in different parts of the India and its subpopulations, depending on a variety of inter-related historical, behavioural, environmental type of population studied, genetic factors, socioeconomic status and other risk factors. In India, the prevalence of HBsAg positivity in pregnant women has been reported to range from 0.61–6.3%.[2,8-11] In our study, the overall seroprevalence of HBsAg positivity in pregnant women was found in age group of 20-24 years, with or without jaundice, and attending the antenatal clinic, was in accordance with the study of Khakhkhar Vipul et al[14], and comparable to the seroprevalence 0.9% reported by Dwivedi M et al[9]. Some of the studies from India, as carried out by Mittal et al[11], Gill et al[12], Nayak et al[13] and Khakhkhar Vipul et al[14], reported higher seroprevalence rate of 6.3 %, 5%, 3.7% and 3.07% respectively, for HBsAg among pregnant women in different trimesters of pregnancy.

| Table-2: HBsAg seropositivity in different trimesters of pregnancy |
|--------------------------|----------------|----------------|
| Trimesters               | No. of pregnant women | HBsAg positive (%) |
| First                    | 274             | 02 (0.72)      |
| Second                   | 613             | 05 (0.81)      |
| Third                    | 928             | 14 (1.50)      |

The overall HBsAg seropositivity of 1.15% in pregnant women in this study recommends appropriate antenatal screening, proper preventive and timely interventional measures targeted at all the pregnant women, in order to avoid vertical transmission of hepatitis B virus infection.
to neonates. Furthermore, in particular, health education about modes of transmission of hepatitis B virus, and other risk factors, has to be given to all pregnant women.

References


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