

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

Vijay C Ambade¹, Indu Bhushan², Rashmi Sinha³

¹ Department of Microbiology, ACPM Medical College, Dhule, Maharashtra, India

² Department of Pathology, ACPM Medical College, Dhule, Maharashtra, India

³ Department of Biochemistry, ACPM Medical College, Dhule, Maharashtra, India

Correspondence to: Vijay C Ambade (drvijayambade@gmail.com)

DOI: 10.5455/ijmsph.2014.240820142

Received Date: 02.08.2014

Accepted Date: 24.08.2014

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 4½ 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	Percentage
15-19	222	01	0.45
20-24	588	11	1.87
25-29	520	06	1.15
30-34	337	02	0.59
35-39	105	01	0.95
40-45	43	00	0.0
Total	1815	21	1.15

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 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 (1.15%), was in agreement with a seroprevalence of 1.1% reported by Pande et al,^[9] and comparable to the seroprevalence 0.9% reported by Dwivedi M et al^[2]. 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, in comparison to our study. In few studies from India, as by S. Chatterjee et al^[15] (0.82%) and Shazia Parveen S. et al^[8] (0.61%), the seroprevalence rate reported were lower than the present study. The seroprevalence of hepatitis B in pregnant women varies from country to country. The prevalence of sero-positive HBsAg among pregnant women in our study can be also comparable with 1.6%, 1.47% and 1.37% as reported in some countries like Saudi Arabia^[16], Southeastern Turkey^[17] and Pakistan^[18] respectively. Regarding age, in the present study, high HBsAg seropositivity rate in pregnant women was found in age group 20-24 years, which was in agreement with the study of Dwivedi M et al and Khakhkhar Vipul et al.^[2,14] In relation to trimester of pregnancy, the maximum HBsAg seropositivity of 1.50 % during third trimester, as found in the present study, was in accordance with the findings of Khakhkhar Vipul et al.^[14] However, The correlation of HBsAg seropositivity in selected age groups, and with trimesters of pregnancy in our study, was not found statistically significant ($P>0.05$).

Conclusion

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

- World Health Organization. Introducing Hepatitis B Vaccine in Universal Immunization Programme in India. A Brief Scenario. 2012. Available from: URL: <http://www.whoindia.org/en/section6/section8.htm>
- Dwivedi M, Misra SP, Misra V. Seroprevalence of hepatitis B infection during pregnancy and risk of perinatal transmission. *Indian J Gastroenterol* 2011;30:66-71.
- Okada K, Yamada T, Miyakawa Y, Mayumi M. Hepatitis B surface antigen in the serum of infants after deliver from asymptomatic carrier mothers. *J Pediatr* 1975;87:360-3.
- Tse KY, Ho LF, Lao T. The impact of maternal HBsAg carrier status on pregnancy outcomes: a case-control study. *J Hepatol* 2005;43:771-5.
- Hieber JP, Dalton D, Shorey J. Hepatitis and pregnancy. *J Pediatr* 1977;91:545-9.
- Reinus J, Leikin E. Viral hepatitis in pregnancy. *Clin Liver Dis* 1999;3:115-30.
- Hepatitis in pregnancy. ACOG Technical Bulletin Number 174--November 1992. *Int J Gynaecol Obstet* 1993;42:189-98.
- Shazia PS, Shyamala R, Rao JR, Rao RMV. Sero-prevalence of Hepatitis B surface antigen among pregnant women attending antenatal clinic in a teaching hospital. *J Microbiol Biotech Res* 2012;2:343-5.
- Pande C, Sarin SK, Patra S, Bhutia K, Mishra SK, Pahuja S, et al. Prevalence, risk factors and virological profile of chronic hepatitis B virus infection in Pregnant Women in India. *J Med Virol* 2011;83:962-7.
- Biswas SC, Gupta I, Ganguly NK, Chawla Y, Dilawari JB. Prevalence of hepatitis B surface antigen in pregnant mothers and its perinatal transmission. *Trans R Soc Trop Med Hyg* 1989;83:698-700.
- Mittal SK, Rao S, Rastogi A, Aggarwal V, Kumari S. Hepatitis B: potential of perinatal transmission in India. *Trop Gastroenterol* 1996;17:190-2.
- Gill HH, Majumdar PD, Dhunjibhoy KR, Desai HG. Prevalence of hepatitis B e antigen in pregnant women and patients with liver disease. *J Assoc Physicians India* 1995;43:247-8.
- Nayak NC, Panda SK, Zuckerman AJ, Bhan MK, Guha DK. Dynamics and impact of perinatal transmission of hepatitis B virus in North India. *J Med Virol* 1987;21:137-45.
- Khakhkhar VM, Bhuva PJ, Bhuva SP, Patel CP, Cholera MS. Seroprevalence of Hepatitis B amongst Pregnant Women attending the Antenatal clinic of a Tertiary Care Hospital, Jamnagar(Gujarat). *National Journal of Medical Research* 2012;2:362-5.
- Chatterjee S, Ravishankar K, Chatterjee R, Narang A, Kinikar A. Hepatitis B Prevalence during Pregnancy. *Indian Pediatr* 2009;46:1005-8.
- Alrowaily MA, Abolfotouh MA, Ferwanah MS. Hepatitis B virus sero-prevalence among pregnant females in Saudi Arabia. *Saudi J Gastroenterol* 2008;14:70-2.
- Yavuzcan A, Altinbas A, Altinbas S. An unexpected low Hepatitis B seroprevalence in pregnant women from the rural Southeastern Turkey. *African Journal of Microbiology Research* 2011;5:3942-5.
- Khattak ST, Ali Marwat M, Khattak Iu, Khan TM, Naheed T. Comparison of frequency of hepatitis B and hepatitis C in pregnant women in urban and rural area of district Swat. *J Ayub Med Coll Abbottabad* 2009;21:12-5.

Cite this article as: Ambade VC, Bhushan I, Sinha R. Seroprevalence of Hepatitis B surface antigen among pregnant women in rural based teaching hospital of Northern Maharashtra, India. *Int J Med Sci Public Health* 2014;3:1439-1441.

Source of Support: Nil

Conflict of interest: None declared