

# Seroprevalence of Hepatitis B surface antigen among pregnant women attending rural based tertiary care teaching hospital in Northern Telangana, India: A cross sectional study

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## ABSTRACT

### Background:

Hepatitis B virus infection is a significant public health problem not only in India but worldwide. Vertical transmission and hepatitis B virus infection early in childhood leads to more chances of progression to chronic liver disease, liver cirrhosis and liver cancer. It will remain so until appropriate and effective nationwide vaccination programmes and other control measures are established.

### Objective:

This study was aimed to investigate the seroprevalence of hepatitis B surface antigen (HBsAg) among pregnant women.

### Materials & Methods:

The present hospital record-based, cross sectional study was conducted at the rural based tertiary care teaching hospital, in Northern Telangana, India, from October 2015 to July 2017. The screening for HBsAg, in all the serum samples collected from pregnant women, was performed using commercial rapid immunoassay kits (HEPACARD - Diagnostic Enterprises, H.P. India). The data of those, who were found to be positive for HBsAg was statistically analyzed with the chi-square test, and results were considered significant if the p value was <0.05.

**Results:** The overall HBsAg seroprevalence rate was 0.9%, among the total 1411 pregnant women included in this study. HBsAg seroprevalence was highest, 1.4% in 18-20 years of age group, 1.1% in the second trimester of pregnancy and 1.5% in primigravidae. The correlations of seroprevalence rate of HBsAg among selected age groups and according to trimester of pregnancy and parity were not found statistically significant. (p value > 0.05)

**Conclusion:** In this study, the overall HBsAg seroprevalence rate was 0.9%. This study recommends that pregnant women should be screened for HBsAg at the first antenatal clinic visit for appropriate management and effective prevention of vertical transmission.

**Keywords:** Hepatitis B surface antigen (HBsAg), pregnant women, seroprevalence

## INTRODUCTION

Hepatitis B virus (HBV) is a double stranded DNA virus belonging to *Hepadnaviridae* family. HBV infection occurs through parenteral, sexual and by vertical transmission<sup>1,2,3</sup>. HBV infection is a global problem but prevalence is highest in Africa and Western Pacific region. WHO reports 2% hepatitis B prevalence among the general population in South East Asia Region<sup>2</sup>. In India, the prevalence of hepatitis B surface antigen (HBsAg) is 3 - 4.2% with over 40 million HBV carriers<sup>3</sup>. Chronic HBV infection in early childhood and its progression to chronic liver disease, failure, cirrhosis or carcinoma causes 15 - 25% adults death. In India, around 1.15 lakh population die due to hepatitis B related complications<sup>2,3</sup>. Clinically, hepatitis B from hepatitis caused by other viral agents cannot be differentiated. Hence, laboratory confirmation of the diagnosis is essential. HBsAg in the serum is the first serological marker to indicate active HBV infection either acute or chronic<sup>4</sup>.

HBV infection in early life usually results in chronic carrier state who becomes the reservoir of infection in the community<sup>1,2,3</sup>. Vertical transmission accounts for 50 million new cases every year<sup>5</sup>. Vertical transmission is one of the most common routes of HBV transmission which contributes to nearly half of 350 million people with chronic HBV infection burden worldwide<sup>1,3</sup>. For reducing the incidence of chronic infections or carrier state, effective strategies like mandatory antenatal screening for HBsAg and HBV vaccination both active as well as passive immediately after birth to all children born to HBsAg positive mothers are necessary. Hepatitis B vaccine is the mainstay to prevent HBV infection and related complications<sup>1</sup>.

The present study was therefore conducted to assess the extent of seroprevalence of HBsAg among pregnant women and this data can further be utilized for implementation of effective control programs.

## MATERIALS AND METHODS

The present hospital record-based, cross sectional study was conducted at the rural based tertiary care teaching hospital in Northern Telangana, India, from October 2015 to July 2017. In this period, total 1411 women, in any trimester of pregnancy attending hospital were subjected to the study. After informed consent, blood samples were collected from pregnant women. The screening for HBsAg, in all the serum samples collected from pregnant women, was performed using commercial rapid immunoassay kits (HEPACARD - Diagnostic Enterprises, H.P. India), as per the manufacturer's instructions. The data of those, who were found to be positive for HBsAg were statistically analyzed with the chi-square test, and results were considered significant if the p value was <0.05.

## RESULTS

In this study, a total 1411 pregnant women, in the age group 18-40 years were included. The overall seroprevalence of HBsAg was found to be 0.9% [Table 1]. The highest seroprevalence rate 1.4% was found in the age group of 18 – 20 years, followed by 1.1% and 0.8% in the age group of 26 – 30 years and 21 – 25 years respectively. The correlation between age group and seroprevalence of HBsAg among pregnant women was not found statistically significant (p value >0.05).

**Table 1: HBsAg - Age specific seroprevalence among pregnant women**

Age Group (Years)	Number of pregnant women	HBsAg positive cases (%)
18 - 20	282	04 (1.4)
21 – 25	837	07 (0.8)
26 – 30	263	03 (1.1)
31 - 35	26	00
36 - 40	03	00
<b>Total</b>	<b>1411</b>	<b>14 (0.9)</b>

p value = 0.89, (Statistically not significant)

HBsAg seropositivity in the different trimester of pregnancy showed highest seroprevalence in the second trimester (1.1%), followed by the third trimester (1%) and lowest seroprevalence was found during the first trimester (0.8%) of pregnancy [Table 2]. The association between gestational age and HBsAg seropositivity among pregnant women was not found statistically significant (p value > 0.05).

**Table 2: Gestational age with HBsAg seropositivity (n=1411)**

Gestational Age	Number of pregnant women	HBsAg positive cases (%)
	476	04 (0.8)
	542	06 (1.1)
	393	04 (1.0)

p value = 0.91 (statistically not significant)

The highest proportion (1.5%), of HBsAg seropositivity, was found among primigravidae whereas only 0.5% was noted among multiparous women.[Table 3] However, there was no statistically significant relationship between parity and HBsAg seropositivity among pregnant women (p value > 0.05).

**Table 3: Parity and HBsAg seropositivity among pregnant women (n=1411)**

Parity	Number of pregnant women	HBsAg positive cases (%)
Primigravidae	682	10 (1.5)
Multigravidae	729	04 (0.5)

p value = 0.08 ( statistically not significant)

## DISCUSSION

Various studies from India reported, the seroprevalence of HBsAg positivity among pregnant women ranging from 0.61 – 9.5%. This variation in seroprevalence rate in India could be due to differences in screening methods used for HBsAg detection, geographical variations, cultural and behavioural differences regarding possible risk factors for HBV infection and the level of awareness on the acquisition of HBV infection. The present study reported the overall seroprevalence of HBsAg among pregnant women as 0.9%. This was in agreement with seroprevalence reported from other studies in India by Dwivedi M et al (0.9%)<sup>6</sup>, Saraswathi K et al (0.9%)<sup>7</sup>, and comparable with Parveen S et al (0.61%)<sup>8</sup>, Chatterjee S et al (0.82%)<sup>9</sup>, Sathyakala R et al (1.01%)<sup>10</sup>, Shyamala R et al (1.06%)<sup>11</sup>, Pande C et al (1.1%)<sup>12</sup>, Sibia P et al (1.11%)<sup>13</sup>, Ambade V et al (1.15%)<sup>14</sup>. Various studies from different parts both within and outside India showed higher seroprevalence rate compared to our study [Table 4]. Highest seroprevalence was reported by Prakash C et al (9.5%) from India.

**Table 4: Chart showing HBsAg seroprevalence reported by different studies**

Study	Year	Location	Sample Size	Prevalance Rate
Present study	2017	Karimnagar	1411	0.9%
Mehta K et al <sup>15</sup>	2013	Jamnagar	1038	2.9%

Khakhkhar V et al <sup>16</sup>	2012	Jamnagar	2050	3.07%
Banerjee A et al <sup>17</sup>	2005	Kolkata	400	3.7%
Sinha A et al <sup>18</sup>	2016	Patna	1150	3.9%
Paranjothi S et al <sup>19</sup>	2009	Krishnagiri	762	5.1%
Bakthavatchalu S et al <sup>20</sup>	2012	Bangalore	500	7.8%
Prakash C et al <sup>21</sup>	1998	Delhi	1112	9.5%
Metaferia Y et al <sup>22</sup>	2016	Ethiopia	269	7.8%
Afzali H et al <sup>23</sup>	2015	Iran	768	1.56%
Adegbesan O et al <sup>24</sup>	2015	Nigeria	150	7.3%
Khattak S et al <sup>25</sup>	2009	Pakistan	5607	1.37%
Alrowaily M et al <sup>26</sup>	2008	Saudi Arabia	755	1.6%

We observed the highest seroprevalence of HBsAg positivity 1.4%, in the age group of 18-20 years. This finding was not in agreement with other studies<sup>6-8,10,13-16,18,22-24</sup>.

In our study highest seroprevalence of HBsAg positivity was found in the 2nd trimester, 1.1%. This was comparable with Mehta K et al<sup>15</sup> and was at variance with the findings from similar work<sup>14,22,23</sup>.

Present study showed higher HBsAg seropositivity 1.5% among primigravidae. This finding was not in agreement with the study by Adegbesan O et al<sup>24</sup>. However, selected age groups, gestational age, parity and HBsAg seropositivity among pregnant women, this correlation was not found significant statistically (p value >0.05).

## CONCLUSION

In this study, the overall HBsAg seroprevalence among pregnant women was 0.9%. This study recommends mandatory screening of all pregnant women for HBsAg at the first antenatal clinic visit irrespective of risk factors for effective prevention of vertical transmission. Raising awareness regarding HBV infections, transmission and preventive measures will effectively reduce the generation of new reservoirs in the community.

## REFERENCES

- Ananth Narayan, Paniker. Text Book of Microbiology, 9th Ed, Universities Press, India, 2013; pp 540-48.
- WHO: Hepatitis B. Fact Sheet No.204. World Health Organization. (Reviewed July 2017) (<http://www.who.int/mediacentre/factsheets/fs204/en/>)
- WHO: Hepatitis B. Fact Sheet\_B\_CTC.cdr 2016 [http://www.searo.who.int/india/topics/hepatitis/factsheet\\_b\\_hepatitiday2016.pdf?ua=1](http://www.searo.who.int/india/topics/hepatitis/factsheet_b_hepatitiday2016.pdf?ua=1)
- Horvat RT, Tegtmeier GE. Hepatitis B and D viruses. Manual of Clinical Microbiology. In: Murray PR, Baron EJ, Jorgensen JH, Pfaller MA and Tenover FC, Tenover FC, editors. Washington D.C: ASM Press.2003:1464-78.
- Patton H, Tran TT. Management of Hepatitis B during pregnancy. *Nat Rev Gastroenterol Hepatol* 2014;11:402-49.
- Dwivedi M, Mishra P et al. Seroprevalence of hepatitis B infection during pregnancy and risk of perinatal transmission. *Indian J Gastroenterol* 2011;30:66-71.
- Saraswathi KS, Farhana Aljabri. The study of prevalence of Hepatitis B surface antigen during pregnancy in a tertiary care hospital, South India. *Der Pharmacia Lettre* 2012;4:983-85.
- Shazia Parveen S, Shyamala R, Janardhan Rao R, Rama Rao MV. Sero-prevalence of Hepatitis B surface antigen among pregnant women attending antenatal clinic in a teaching hospital. *J Microbiol Biotech Res* 2012;2:343-45.
- Chatterjee S, Ravishankar K, Chatterjee R, Narang A, Kinikar A. Hepatitis B prevalence during pregnancy. *Indian Pediatr* 2009;46:1005-8.
- Sathiyakala R, Ushadevi G, Karthika J. Seroprevalence of Hepatitis B infection among pregnant women in South India. *Int J Reprod Contracept Obstet Gynecol* 2017;6:249-51.
- Shyamala R. and Janardhan Rao. The study of prevalence of hepatitis B surface antigen in a tertiary care hospital in South India. *Der Pharmacia Lettre* 2013;5:11-12.
- Pande C, Sarin SK, Patra S. Prevalence, risk factors and virological profile of chronic hepatitis B virus infection in pregnant women in India. *J Med Virol* 2011;83:962-67.
- Sibia P. Seroprevalence of Hepatitis B Infection among Pregnant Women in One of the Institute of Northern India. *Journal of Clinical and Diagnostic Research*. 2016;10:QC08-9.
- 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;3:1439-41.
- Mehta KD, Antala S, Mistry M, Goswami Y. Seropositivity of hepatitis B, hepatitis C, syphilis, and HIV in antenatal women in India. *J Infect Dev Ctries* 2013; 7:832-37. doi:10.3855/jidc.2764

16. Khakhkhar VM, Bhuva PJ, Bhuva SP, Patel CP, Meera S C. Sero-prevalence of hepatitis b amongst pregnant women attending the antenatal clinic of a tertiary care hospital, jamnagar (Gujarat). *Natl J Med Res* 2012;2:362–65.
17. Banerjee A, Chakravarty R, Mondal PN, Chakraborty M. Hepatitis B virus genotype D infection in antenatal patients attending a maternity hospital in Calcutta; South East Asian *J. Trop Med Public Health* 2005;36:203-20.
18. Sinha A, Sharan M, Shahi SK. Seroprevalence of Hepatitis B Virus in Pregnant Women at a Tertiary Care Hospital of Eastern India. *National Journal of Laboratory Medicine*. 2016; DOI: 10.7860/NJLM/2016/21657:2151.
19. Paranjothi S, Vijayarani H. Prevalence of hepatitis b virus surface antigen in pregnant women attending a private hospital in krishnagiri. *Adv Bio Tech*. 2009;9:38–40.
20. Bakthavatchalu S. Hepatitis B surface antigen carrier state among asymptomatic pregnant women and its correlation with vertical transmission. *Int J Res Pharm Sci* 2012;2:111–20.
21. Prakash C, Sharma RS, Bhatia R, Verghese T, Datta KK. Prevalence of North India of hepatitis B carrier state amongst pregnant women. *Southeast Asian J Trop Med Public Health* 1998;29:80-4.
22. Metaferia Y, Dessie W, Ali I, Amsalu A. Seroprevalence and associated risk factors of hepatitis B virus among pregnant women in southern Ethiopia: a hospital-based cross-sectional study. *Epidemiology and Health* 2016;38:e2016027. doi:10.4178/epih.e2016027.
23. Afzali H, Momen Heravi M, Moravveji SA, Poorrahnama M. Prevalence of hepatitis B surface antigen in pregnant women in Beheshti hospital of Kashan, Isfahan. *Iran Red Crescent Med J* 2015;17:e20598.
24. Adegbesan-Omilabu M, Okunade K, Gbadegehin A, Olowoselu O, Oluwole A, Omilabu S. Seroprevalence of hepatitis B virus infection among pregnant women at the antenatal booking clinic of a Tertiary Hospital in Lagos Nigeria. *Niger J Clin Pract* 2015;18:819-23.
25. 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.
26. Alrowaily MA, Abolfotouh MA, Ferwanah MS. Hepatitis B virus sero-prevalence among pregnant females in Saudi Arabia. *Saudi J Gastroenterol* 2008;14:70–2.

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