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Hepatitis B Virus Infection in Asymptomatic Pregnant Women - A Report from Chennai South India

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ABSTRACT

HBV as the major causative agent for chronic viral hepatitis in adults and children. Authenticated documentation on hepatitis B virus related pregnancy hepatitis in asymptomatic virus infected mothers and the impact of prevention has not been updated. The present study was undertaken to determine the prevalence of chronic HBV infection among antenatal women. 5042 asymptomatic healthy pregnant women in age group of 17 to 40 attending antenatal clinic of major centers were screened for HBV infection. Results: The overall HBsAg prevalence was 5.4% (276/5042) among asymptomatic pregnant women and was almost evenly distributed between the three trimesters. Hepatitis e antigen (HBeAg) was positive in 14.7% (41/276), and 57.2% (158/276) were anti HBe positive. Hepatitis B virus DNA (HBV DNA) was positive in 93.3% (28/30) amongst women who were HBeAg positive indicating high vertical transmission rate. Conclusion: Overall prevalence of Hepatitis B virus infection in pregnancy was 5.4%, is not uncommon in pregnancy; a significant number are HBeAg negative.

KEYWORDS: pregnancy, antenatal; screening; hepatitis B; perinatal transmission

Introduction:

India falls into the intermediate endemicity area (4%) as regards the prevalence of HBV infection.[1,2] Vertical and horizontal transmission in the perinatal period and early childhood are the major ways of propagation of this infection in India. [3,4,5]

Chronic hepatitis B virus (HBV) infection in pregnancy presents unique questions in pregnancy which includes the effects of hepatitis B on pregnancy, effects of pregnancy on the natural course of hepatitis B infection, treatment of hepatitis B during pregnancy and prevention of mother-to-infant transmission. [6]

Most often chronic HBV infection is usually mild in pregnant women, and majority are inactive carriers, but may undergo a flare soon after delivery

Vertical transmission accounts for 35% to 50% of chronic HBV infections and the risk is greatest (65%-93%) for infants born to mothers who are seropositive for both HBsAg and Hepatitis B e antigen (HBeAg), in the third trimester and especially in the absence of immunoprophylaxis. [7]. Newborns born to such mothers remain at high risk of acquiring infection till the age of 5–6 years, even if not infected at birth. The transmission to the offspring is significantly low in the first trimester and in HBeAg negative mothers i.e.10% - 15 %[8].

What would be the burden of perinatal transmission to the society? Presuming a perinatal HBV infection rate of 90% amongst infants born to HBsAg and HBeAg positive pregnant females and 17% amongst infant born to HBsAg positive but HBeAg negative mothers, Mittal et al 4estimated that 1.17% to 1.64% infants out of 24 million births occurring annually in this country would be infected with HBV. Approximately, every year 2.8 to 3.9 lakh infants are being infected by HBV perinatally, 90% of whom will eventually develop chronic HBV infection.

Currently, it is believed that most of the HBV transmission in India is due to the horizontal mode rather than vertical transmission. This is supported by the fact that 3% of children born to HBsAg negative mothers acquire HBsAg within the 6 months of birth. [9]

With this background information, the aim of the present study was to determine the prevalence of chronic hepatitis B infection amongst antenatal mothers and the risk of neonatal transmission in south Indian population.

Materials and Methods:

Mothers attending the antenatal clinic of the Institute of Obstetrics and Gynecology, in 6 major hospitals in Chennai were screened for HBsAg. When positive, they were further screened for anti HBc, HBeAg, anti HBe and HBV DNA (qualitative). HBV DNA data was available for 220 women i.e. 79.7%. 56 samples had to be discarded due to insufficient samples and technical reasons.

Women diagnosed in the past as HBsAg positive or those who were on currently on treatment for HBV infection or were treated in the past for HBV infection or was diagnosed as a case of chronic liver disease were excluded from the study.

Results:

A total of 5042 pregnant women were screened for HBsAg. 276 women (5.4%) were HBsAg positive (95% CI; 4.86 - 6.13). All were anti-HBc positive. Overall 44 women (20%; (95% CI 30.3-61.2) were positive for HBV DNA.

Table 2 & 3 summarises the HBe Ag status and HBV DNA positivity amongst the 276 women. Amongst the 41 women who were HBeAg positive (14.7%; 95% CI 10.87-19.62) HBV DNA was positive in 28 of 30 samples screened (93.3%; 95% CI 77.5 - 99.36). Amongst the 158 anti HBe positive (57.2%; 95% CI 51.7-63.16), only 9 women of 119 samples tested were HBV DNA were positive (7.5%; 95% CI 3.48-13.92). In the remaining 77 women (27.8%; 95%; CI 31.8-45.8) who were neither HBeAg or anti HBe positive, HBV DNA was positive in 7 of the 71 samples tested i.e. 9.8% (95% CI 3.99- 19.35).

In the first trimester HBsAg was positive in 5.2%, 5.7% positive in II trimester and 5.35% in third trimester.

Discussion

Infection with hepatitis B virus (HBV) is of global importance. The HBsAg positivity rate in India is different in the different regions of the country. The overall chronic HBsAg positivity rate is often quoted as being 4.7%.[10]

Hepatitis B virus infection is important not only because it is associated with acute and chronic hepatitis, liver cirrhosis, and primary hepatocellular carcinoma, but also because it represents the most important reservoir of infection in the community through horizontal and vertical transmission. [11]

In India, the prevalence rate of HBsAg positivity in pregnant women varies from 1–9% in different parts of the country and HBeAg positivity rates vary from 4.8–68.7%.9 In India, a study from North India looked into the relative contribution of perinatal and horizontal transmission of HBV in newborn upto the age of 6 months. 10The study showed that when HBeAg positivity was 7.8%, risk of perinatal transmission was 18.6% from HBsAg-positive mothers and horizontal transmission during the same period (6 months) was 3% among infants of HBsAg-negative mothers, suggesting that most of HBV infection in the first year of life is more likely to be due to horizontal rather than vertical transmission.[9]

Several other studies from India have reported on the potential of perinatal transmission of hepatitis B infection. Mittal et al 4 in 1996 studied the potential of hepatitis B perinatal transmission in 850 pregnant women 1996. HBsAg positivity was 4.6% and HBeAg was detected in 18% of HBsAg positive mothers, figures similar to our study. In a seroepidemiological study by Banerjee et al 11 to determine the hepatitis B virus carrier rate and infectivity status among antenatal patients in Calcutta, 15 of 400 antenatal mothers (3.74%) were carriers of HBV genotype D. Four (1.0%) of them were positive for HBeAg with a high risk of transmitting infection to their babies. None of the mothers had precore mutant HBV, which is known to be associated with transmission events from HBeAg mothers to their babies.

Pande et al 12 in a large study on prevalence, risk factors and chronological profile of chronic hepatitis B virus infection in India amongst a large pregnant women population of 20104 found HBsAg to be positive in 224 women (1.1%) compared to 1.2% amongst controls. They found that past blood transfusions and surgery were significant risk factors for infection with HBV. Of the women who were HBsAg positive, the ALT levels were normal in 54% of the women and HBV DNA levels were above 2,000 IU/ml in 71% of women. The median HBV DNA levels were higher in women who were HBeAg positive compared to the HBeAg negative group. The most common HBV genotype was D (84%) followed by A+D and A (8% each). The study concluded that the prevalence of HBsAg positivity among asymptomatic pregnant women in North India is 1.1% with 71% having high HBV DNA levels. These women are at a high risk of transmitting infection to their newborns.

From the above reports, it appears that the overall prevalence of HBsAg amongst pregnant women in northern and eastern parts of India were significantly low compared to reports from our study and other centres in south India. HBeAg positivity has also shown regional variations: it being positive in 10% to 20% in Delhi and Maharashtra, and more than 20% in Tamilnadu, Kerala and Haryana.

In conclusion, the overall prevalence of HBV infection in pregnancy in our series is 5.4 %, 14.7% were HBeAg positive. HBV-DNA positivity was high in 93.3% of the HBeAg positive patients indicating a higher level of infective HBV carrier pool in Tamil Nadu population[13.]

Table I : Asymptomatic HBsAg status

	I trimester	II trimester	III trimester	At the time of delivery
No. of patients	384	1056	3584	18
15-≤20 yrs	63	102	432	0
21-≤30 yrs	299	889	3054	16
31-≤ 40 yrs	22	65	98	2
HBsAg positive	20 (5.2%)	60(5.7%)	192(5.35%)	4(22.2%)

TABLE 2
HBV MARKER PROFILE IN ASYMPTOMATIC CARRIER MOTHERS

HBV Markers	Asymptomatic Pregnant Women	
	No. Positive / No. Analysed	% (95% CI)
HBsAg	276/5042	5.4 (4.8-6.1)
Anti HBc	276/276	100 (98.8-100)
HBeAg Positive	41/276	14.7 (10.87 – 19.62)
Anti –HBe Positive	158/276	57.2 (51.1 – 63.16)
Both HBeAg / Anti HBe Negative	77/276	27.8 (22.6-33.5)

TABLE : 3
HBV-DNA POSITIVITY IN THE ASYMPTOMATIC HBsAg POSITIVE ANTENATAL WOMEN (n =220)

Groups	No. Positive / No. Analysed	% (95% CI)
HBsAg pos & HBeAg positive	28/30	93.3 (77.5-99.3)
HBsAg Pos &HBeAg negative & Anti HBe Positive	9/119	7.5 (3.4-13.9)
HBsAg alone (HBe & antiHBe negative)	7/71	9.8 (3.9-19.3)
Total	44/220	20 (30.3-61.2)

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