Prevalence and outcome of Hepatitis B infection in antenatal Mothers

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Abstract: Objective: To study the prevalence and pregnancy outcome of Hepatitis B infection in antenatal Mothers
Methods: In this prospective randomized study a total of 500 women were included with viable pregnancy before 38 weeks of gestation . After a thorough history and complete examination , 2 ml of venous blood was collected in a test tube after informed consent. Evaluation of maternal serum Hepatitis B surface antigen (HBsAg) and Hepatitis B envelope antigen (HBeAg) were done by chromatographic immunoassay Method. Similarly cord blood of neonates at delivery was taken for evaluation of Hepatitis B surface antigen by chromatographic immunoassay. Results: 12 (2.4%) out of the 500 women studied were found to be positive for Hepatitis B surface antigen (HBsAg). None of them were found positive for serum HBeAg, thus implying that they were not in the infective stage for vertical transmission, this is highly significant. Assessment of risk factors revealed history of blood transfusion, surgery and parenteral exposure were 3 cases each. Only one case was having history of jaundice. All the 12 (2.4%) neonates born to HBsAg positive mothers , were negative for HBsAg. Hence the risk of vertical transmission of Hepatitis B virus (HBV) infection was low if mother is HBeAg negative. Conclusion: seroprevalence of HBsAg in antenatal women was found to be 2.4% .As vertical transmission is responsible for majority of infections, it is desirable to screen all the pregnant women for HBsAg and immunize the neonates. [Sonika D NJIRM 2017; 8(1): 13-16]

Keywords: Hepatitis B virus , Prevalence , HBsAg ,HBeAg , Vertical Transmission.

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Introduction: The term 'Hepatitis' is derived from the combination of two greek words "hepatos" (Liver) & "itis" (inflammation).It is a disease of the liver usually caused by viral infections, toxic agents or drugs but may also be due to an autoimmune response[1].Infection with hepatitis B virus (HBV) is a serious public health problem worldwide and a major cause of chronic hepatitis, cirrhosis and hepatocellular carcinoma(HCC)[2].Routes of infection include vertical transmission and horizontal transmission[3].

Hepatitis B is a major disease of serious global public health problem. It is preventable with safe and effective vaccines that have been available since 1982.The world health organization (WHO) has categorized countries based upon the prevalence of HBsAg into high (more than 8%),intermediate (2-8%), and low (less than 2%) prevalence countries. India falls into the intermediate endemicity area (4%) regarding the prevalence of HBV infection[4].The highest endemicity is found in Yemen where the prevalence of HBsAg ranged from 8-20% including pregnant women[5].

Hepatitis B virus is small, double stranded member of hepadnaviridae family of hepatotropic DNA virus.HBV replicates in hepatocytes but is secreted andmaintained in extrahepatic sites including blood, saliva and other body fluids.HBV infection is highly contagious and relatively easy to be transmitted from one infected individual to another by contaminated blood, during birth, unprotected sex and by sharing needles.

Clinically viral hepatitis is acute and chronic cases. In acute hepatitis, there is sudden onset of fever, headache, bodyache and joint pains, loss of appetite, nausea and vomiting. The diagnosis is basically made on clinical and epidemiological findings. Depending on clinical signs, the disease has been divided into pre-icteric, icteric and post-icteric stages. Hepatitis is a self limiting disease and complete recovery is seen within 3 weeks among patients with bed rest and highly nutritious diet, rich in protein and carbohydrates. Hepatitis B virus transmission from mothers to their newborns infants is a common event in population. The risk of progression to chronic HBV infection is inversely proportional to the age at which the infection was acquired. Without immunoprophylaxis, upto 90% of infants born to hepatitis B envelope antigen (HBeAg)-positive mothers become HBV carriers. So for that purpose it is important to know the status of hepatitis B infection in antenatal women and then outcome of their pregnancies. Vaccination of babies born to carrier mothers would prevent transmission. Hepatitis B immunoglobulin (HBIG) given at the time of birth in combination with three doses of the recombinant hepatitis B vaccine given over the first 6 months of life, has been upto 95% effective in preventing perinatal transmission.

Methods: This prospective randomized study was conducted in the department of Obstetrics and Gynecology, Rohilkhand Medical college and Hospital, Bareilly, U.P (India).A total of 500 pregnant women with viable pregnancy before 38 weeks of gestation were included in this study attending the antenatal OPD with unknown status for HBsAg over a period of one year.

The following were the exclusion criteria for our study:
Trophoblastic disease.
Ectopic pregnancy.
Abortions.

Intrauterine death: Women already immunized with hepatitis B vaccine. All the participants at her 1st antenatal visit were informed about the importance of screening and its potential benefits. A written consent was taken from every participant. After a thorough history and complete general, systemic and obstetrical examination,2 ml venous blood was collected in a test tube after informed consent from the women. The participants were evaluated for hepatitis B surface antigen by taking blood sample and if positive, were subjected to hepatitis B-envelope antigen (HBeAg) test by the method of chromatographic immunoassay.LFT was done in HBsAg positive cases. Complete record of the current pregnancy including mode of transmission (Abortion, Preterm labour, Full term labour) was maintained. Examination of placenta and umbilical cord in detail regarding weight, gross examination and any abnormality was noted. Cord blood was taken for Hepatitis B surface antigen during delivery. Baby's sex, weight, APGAR score and obvious congenital malformation was noted.

Evaluation of maternal serum Hepatitis B surface antigen (HBsAg) and Hepatitis B envelope antigen (HBeAg) were done by chromatographic immunoassay. Similarly cord blood of neonates at delivery was taken for evaluation of Hepatitis B surface antigen in mothers with reactive hepatitis B surface antigen and it was tested by chromatographic immunoassay.

Infants born to HBsAg positive mothers and received active and passive immunoprophylaxis within 24 hrs of birth. Statistical analysis was done by using Chi-square test. All women were followed up to the end of pregnancy.

Results: Table 1-AGE

Age Group		Study Group n = 500	Percentage (%)
1.	≤19	9	1.8%
2.	20-24	165	33%
3.	25-29	278	55.6%
4.	30-34	45	9.0%
5.	≥35	3	0.6%
	Total	500	100%

Mean ± SD 26 ± 3.5

It was observed that out of 500 cases, nine (1.8%) were 19 years or less,165(33%) were between 20-24 years,278 (55.6%) were between 25-29 years,45 cases (9%) in the age group of 30-34 years and 3 cases (0.6%) were 35 years or more. Most of the cases (88.6%) were in the age group of 20-29 years. Mean age in this study group was 26 ±3.5 years.

Table 2- Parity

Period of Gestation (in weeks)	No. of Patients (n=500)	Percentage (%)
PGR	230	46%
G2	136	27.2%
G3	105	21%
G4	18	3.6%
≥G5	11	2.2%
TOTAL	500	100%

(x^2 = 328.6) (p value = 0.180)

In our study, maximum number of cases, 230 (46.0%) cases were primigravida and gravida 2 were 136 (27.2%) cases, gravida 3 were 105 (21.0%) cases, gravida 4 were 18 (3.6%) cases and 11 (2.2%) cases were gravida ≥5.When primigravidaewere compared with multigravidae, it was found significant (p value=0.180).

Table 3- Socio-Economic Status

Education	Study Group (n=500)	Percentage (%)
Class I	8	1.6%
Class II	22	4.4%
Class III	450	90.0%
Class IV	13	2.6%
Class V	7	1.4%
Total	500	100%

In present study, maximum number of cases (90.0%) belonged to class III (lower middle) according to modified Kuppuswamy's socioeconomic status.

Table 4- Status Of Serum Hbsag And Serum HBeAg INHBsAG Positive Antenatal Women

Test	Status	No. of cases	(%)
HBsAg N=500	Non Reactive	488	97.6%
	Reactive	12	2.4%
HBeAg N=12	Non Reactive	12	100%
	Reactive	-	-
Total	500		100%

(x^2 = 453.1) (p value = 0.00)

In our study, only 12 (2.4%) cases were positive for HBsAg and 488 (97.6%) cases were non reactive. All twelve (2.4%) cases positive for HBsAg were further tested for serum HBeAg. None of them were reactive to serum HBeAg ,thus implying that they were not in the infective stage for vertical transmission, this is highly significant (p value=0)

Table 5- Risk Factors For Hbv Infection In Hbsag Positive Pregnant Women.

Risk Factor	No. of Cases (n=12)	(%)
Blood Transfusion	3	25%
Hospitalization	2	16.7%
Jaundice	1	8.3%
Surgeries	3	25%
Parenteral Exposure	3	25%

Out of 500 cases in study group, only twelve (2.4%) cases were HBsAg positive. Previous history of surgery, Blood transfusion, and Parenteral exposure were three (25%) cases each, followed by hospitalization two (16.7%) cases. There was only one (8.3%) case having previous history of jaundice.

Table 6- Vertical Transmission Rate

Study Group (n = 500)	No. of Newborn	Cord Blood Serum HBsAg Status
Non- Reactive (n=488)	488	Not Done
Reactive (n=12)	12	Non Reactive
Total	500	

All the twelve (2.4%) neonates born to HBsAg positive mothers were screened for HBsAg in cord blood at birth and none of them were reactive for HBsAg. Hence the risk of vertical transmission of Hepatitis B virus (HBV) infection was low if mother is HBeAg negative. As in our study all of the HBsAg positive mothers were HBeAg negative.

Discussion: Demographic Profile: In the present study , 68.4% of pregnant women were booked as compared to 158 (31.6%) unbooked cases (p=0.00).Out of 500 cases,384 (76.8%) were from rural area and 116 (23.2%) were from urban areas. House makers constituted 330 (66.0%) cases and only seven (1.4%) were employed.470 (94%) of cases had formal education and only 30 (6%) were illiterate (p=0.00).

Infection with hepatitis B virus is of global importance. The HBsAg positivity rate in India is different in the different regions of the country. India is an area of intermediate HBV endemicity, with the total number of HBV carriers in the general population estimated to be around 43 million. Hepatitis B virus transmission from mothers to their newborn infants is a common event in populations with a high rate of HBV infection and a high prevalence of hepatitis B envelope antigen (HBeAg) among surface antigen (HBsAg) carrier mothers. Carrier neonates are usually symptomless; however, evidence suggests that they may be at risk of developing chronic liver disease and hepatocellular carcinoma later in life (Kumar R et al,2008)[6].

In the present study, the seroprevalence of serum HBsAg among pregnant women was found 2.4%,which was less than the study by T.K.V Shravanam et al[7] (3.8%) and by A Banerjee et al[8] (3.75%),but more as compared to study conducted by Habiba Sharaf Ali and Ashraf Memon M (2007)[9] and Knorr et al (2008)[10],which was (1.57%) and (1.59%) respectively.
In pregnant women in India, the seroprevalence of serum HBsAg positivity varies from 1%-9% and HBeAg varies from 4.8%-68.7% depending upon the region. There are significant variations in the prevalence of HBsAg in different parts of the world. The prevalence is 0.1% or less in Northern America and Australia (Sarin SK & Manoj kumar,2009)[11].India falls in intermediate zone according to WHO classification (>2-7% prevalence).Seroprevalence of serum HBsAg (2.4%) in the present study also falls in this zone (Intermediate zone).

In our study HBeAg positivity rate among HBsAg positive antenatal pregnant women was zero. HBeAg positivity in other studies conducted by Zanetti et al (1982)[12] 4.8%,Karin Rumi et al (1998)[13] 30.2% and by Kurien T et al (2005)[14] was 23.6%.S.HBeAg reflects the stage of infectivity,so in those cases in which serum HBeAg was positive along with HBsAg, there was more chances of vertical transmission to newborn as

compared to only serum HBsAg positive cases. Pregnant women should be routinely investigated for HBV infection.

Conclusion: In conclusion, seroprevalence of HBsAg in antenatal women was found to be 2.4% and this falls within the intermediate zone according to WHO classification .As vertical transmission is responsible for majority of infections, it is desirable to screen all the pregnant women for HBsAg and immunize the neonates.

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