



ORIGINAL RESEARCH PAPER

Gynaecology

A CROSS SECTIONAL STUDY ON PREVALENCE OF HEPATITIS B & C VIRUS IN ANTENATAL WOMEN IN A TERTIARY CARE HOSPITAL, CHENNAI, TAMIL NADU, INDIA

KEY WORDS: Hepatitis B, Hepatitis C, Jaundice

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ABSTRACT A study was conducted to determine the prevalence of hepatitis B virus surface antigen (HBsAg) and hepatitis C (HCV) antibody amongst 1000 healthy antenatal women attending OPD in a tertiary care hospital. The combined mean age of positive cases was 25.3years. Of the 1000 blood samples tested, 54 (5.4%) and 5 (0.5%) were positive for the presence of hepatitis B and C respectively. The seropositive cases did not have any contributory risk factors. No significant relationship was seen between HBV and HCV seropositivity and demographic factors. It is suggested that all pregnant women be routinely screened for HBV in the 3rd trimester as the majority of positive cases found in 3rd trimester and it was statistically significant at p-value <0.05. Significant relationship was seen between positive and negative cases of HBV among the previous history of jaundice antenatal women in our study. None of the HCV cases had the previous history of jaundice in the present study.

INTRODUCTION:

Hepatitis B virus (HBV) infection, one of the common infectious diseases in the world and a public health problem, infect the liver of hominioda including humans causing inflammation (hepatitis) and is 50-100 times more infectious than HIV and ten times more infectious than hepatitis C virus (HCV), with many carriers not realizing they are infected with the virus, thus referred to as silent killer¹. It is estimated that more than two billion people have been infected with HBV worldwide and 350 million people have the chronic infection². The seropositive for HBsAg transmit the virus to neonates but in women who are seropositive for both HBsAg and HBeAg, vertical transmission is approximately 90%³. Infection could be acute when it lasts less than six months and often leads to cirrhosis and hepatocellular carcinoma while the highest risk (80-90%) of chronic infections have been found among infected neonates born to HBeAg positive carrier mothers followed by 30% of children infected before six years of age⁴. Acute infection in pregnancy has been shown to induce premature labour with its attendant effects including intra-ventricular hemorrhage^{5,6} and intra-partum and post-partum haemorrhage from coagulation failure due to inadequate vitamin K dependent clotting factors production especially when prothrombin time is prolonged as in fulminant hepatic failure during chronic infections.

This research therefore is necessitated because of the high rate of miscarriages and pre mature births among all groups of child bearing women in this country. This study was carried out to determine the prevalence of HBV and HCV in pregnant women. The objective of the study is to associate the prevalence of hepatitis virus B & C with gravida, previous history of jaundice and gestational age of the antenatal women.

METHODS:

This study is a cross sectional randomized trial retrospective study. This study was conducted in a tertiary care hospital and Department of Microbiology Dr. A.L. Mudaliar Post Graduate Institute of Basic Medical Sciences, Taramani Chennai on 1000 apparently healthy antenatal women of age group (18-35) years attending OPD were screened for Hepatitis B & C viruses between November 2001 and June 2002. These hospitals were chosen because of reports showed that there was a high frequency of attendance of ante-natal patients in this hospital. Patient particulars were filled using a schedule. About 5 ml of venous blood was collected from the samples under strict aseptic precautions using disposable syringes. Sera was separated and stored at -80°C under sterile conditions.

Screening for Hep. B virus.

The Hepatitis B surfaces antigen was screened for using HEPALISA.

HEPALISA is a solid phase enzyme linked immune sorbent assay (ELISA) based on the direct sandwich principle. The microwells are coated with monoclonal antibodies with high reactivity for HBsAg. First the samples are incubated in the wells. After washing the wells, another antibody linked to Horse radish peroxidase (HRPO) is then added. A sandwich complex is formed in the well wherein HBsAg (from serum sample) is trapped or sandwiched between the antibody and antibody HRPD conjugate unbound conjugate is then washed off with wash buffer. The amount of bound peroxidase is proportional to the concentration of HBsAg present in the sample. Upon addition of the substrate reaction, stop solution is added and a yellow colour develops which is finally read at 450nm spectrophotometrically.

Screening for Hep. C virus:

This was done using 3rd generation HCV microlisa and it is an in-vitro qualitative enzyme linked immune sorbent assay for the detection of antibodies against HCV in human serum or plasma.

The Statistical analysis Z test and chi-square test were utilised and the statistical tools percentage, average etc were used to discreet and continuous variable in the study using MS Excel and online statistical software.

RESULTS:

Hypothesis:

H₀= the prevalence of HBV carrier rate is 2.8% in Indian literature
H₁= the prevalence of HBV carrier rate is 2.8% in Indian literature

Formula, for Z test

$$Z = \frac{p - P}{\sqrt{\frac{PQ}{n}}}$$

Where p is the sample proportion of HBV is 0.054, P is the population proportion equal to 0.028

Q = 1 - P = 1 - 0.028 = 0.972 and n = 1000

Therefore Z = (0.054 - 0.028) / √(0.054 x 0.972) / 1000

Z = 0.026 / 0.0072448 = 3.5887

Result:

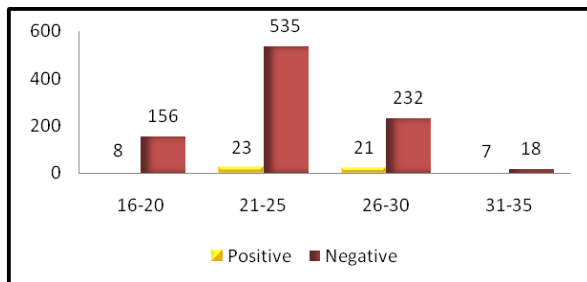
Since the Z value is 3.5887 which is greater than the table value of 1.96 at 5% level of significance, the null hypothesis is rejected and hence the alternative hypothesis is accepted. Therefore, the prevalence of HBV rate of 5.4% is correct in the sample and it is statistically significant at p-value 0.00332

Table 1 Prevalence of HBV and HCV

| VIRUS | POSITIVE | NEGATIVE | TOTAL |
|-------|-----------|-------------|-------|
| HBV | 54 (5.4%) | 946 (0.5%) | 1000 |
| HCV | 5 (0.5%) | 995 (99.5%) | 1000 |

The table 1 shows that out of the 1000 randomly screened 54 were found to be positive for the hepatitis B surface antigen and the prevalence rate of HBV was 5.4%. Similarly, the prevalence of HCV rate was found to 0.5%.

Figure 1 Age Distribution - HBV&HCV



The figure 1 shows the age distribution of hepatitis virus. In all age group the positive cases were found and most of the positive cases were found in the age group (21-30).

Table 2 Distribution of Gravida Among HBV & HCV

| Gravida | Total n=1000 | Positive | Negative |
|---------|--------------|-----------|-------------|
| Primi | 427 | 19 (4.4%) | 408 (95.6%) |
| Multi | 573 | 40 (7.0%) | 533 (93.0%) |

The table 2 shows the distribution of hepatitis B & C viruses among the antenatal women according to their gravida. The highest number of positive cases about 40 of them was in multigravida and it stood at 7%. The increased no. of positive cases in gravida 2 and above could have been due to the increasing age and other unhygienic practices during the previous delivery. There exist no relation among Hepatitis B&C viruses between primi and multigravida antenatal women who were attended the OPD and statistically not significant.

Table 3 Distribution of Gestational Age: HBV & HCV

| Ges. Age | Total | Positive | Negative |
|---------------------------|-------|------------|--------------|
| 1 st Trimester | 106 | 2 (1.89%) | 104 (98.11%) |
| 2 nd Trimester | 358 | 13 (3.63%) | 345 (96.37%) |
| 3 rd Trimester | 536 | 44 (8.20%) | 492 (91.8%) |
| Total | 1000 | 59 (5.9%) | 941 (94.1%) |

The chi-square statistic is 11.541. The p-value is 0.003118. The result is significant at p<0.05.

There exist an association between gestational age and positive cases of hepatitis B virus and hepatitis virus C and statistically significant at p<0.05 and degrees of freedom is equal to 2.

The table 3 shows the distribution of gestational age and both HBV and HCV that positive and negative cases among the antenatal women who attended OPD. It reveals that majority of the positive cases were in 3rd trimester. Thus it is suggested that all pregnant women be routinely screened for HBV and HCV in the 3rd trimester.

Table 4 Distribution Previous History of Jaundice: HBV

| History of Jaundice | Total | Positive | Negative |
|---------------------|-------|------------|--------------|
| YES | 36 | 5 (13.89%) | 31 (86.11%) |
| NO | 964 | 49 (5.08%) | 915 (94.92%) |

The table 4 shows the distribution of previous history of jaundice and hepatitis B virus result. A total of 36 patients out of the 1000 screened women gave a positive history of jaundice. Out of them only 5 were found to be positive for HBV. The remaining 49 HBV

positive cases did not give any history of jaundice. This further reinforces the fact that majority of carrier women of undetected and selective screening for high risk groups is not effective solution to prevent the spread of carrier state in the community. It states that 14% of the previous history of jaundice patient have positive of HBV. There exist an association between previous history of jaundice and HBV result that positive and negative and was statistically significant at p-value<0.05.

DISCUSSION:

The carrier rate of HBV in our present study was found to be 5.4%. In studies conducted in Tamil Nadu using second generation tests carrier rate was found to be 3.9% (range 2.1 – 5.7%) Vasuki et al observed a carrier rate of 3.7 – 4.2%⁷. Similarly, studies conducted by S.K. Panda et al the carrier rate of HBV was 3.77%⁸. Shanmugam et.al observed a carrier rate of 8.7%⁹, Prakash et.al in a study conducted in North India in 1998 gave the HBsAg e positive rate of 9.5%¹⁰, Mittal et al. again from North India recorded a rate of 4.6% by RPHA and 6.34% by microelisa in 1996¹¹.

The prevalence of HCV in our study was 0.5%. Ashok Kumar K. et al. in 2007 showed a prevalence rate 1.03% for HCV¹².

CONCLUSION:

In our study, 53.52% of women who were sero positive did not have any contributory risk factors. The overall carrier rate was found to be 5.4% for HBV in our study which is in par with other Indian Studies. The overall carrier rate was found to be 0.5% for HCV in our study which is in concurrence with other studies. It is suggested that all pregnant women be routinely screened for HBV in the 3rd trimester as the majority of positive cases found in 3rd trimester and it was statistically significant at p-value <0.05.

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