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Original Research Paper

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A CROSS-SECTIONAL STUDY TO FIND OUT THE PROPORTION OF HEPATITIS B VIRUS INFECTION AND ITS ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN TERTIARY HEALTH CARE CENTER IN CENTRAL INDIA

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ABSTRACT

Background: Hepatitis B virus (HBV) infection continues to be a life- threatening health problem throughout world, infecting more than two billion people. While blood transfusion and unsafe therapeutic injection continue to be major risk factors, the role of vertical transmission remains under- estimated. Hence, this study was done to find out the prevalence of HBV infection and associated risk factors among healthy pregnant women in Central India Indore (M.P.). The present study was a prospective, cross-sectional study conducted, in the department of Microbiology of M.G.M. Medical College from June 2021 to June 2022. **Methodology:** After receiving 5 ml of blood sample in the Microbiology Laboratory, serum was separated by centrifugation. They were then tested for Hepatitis B surface antigen (HBsAg) by Rapid Test and Enzyme linked Immunosorbent assay (ELISA). **Results:** Total 610 samples were screened among which 12 (%) were tested positive for HBsAg. Pregnant women found with history of blood transfusion was found to be 5(41.66%), followed by tattooing which was 33.33%, followed by history of multiple sexual partners, HIV positive and family history of HBV infection which was 8.33%,8.33% and 8.33% respectively. **Conclusion:** Perinatal transmission is the major route of HBV transmission in the absence of prophylaxis, a large proportion of viremic mothers transmits infection to neonates. Immunization is the most effective and only way of preventing development of chronic carrier state. Hence all neonates were administered with hepatitis B vaccine and 0.5 ml of hepatitis B immunoglobulin within 12 hours of birth.

KEYWORDS : Hepatitis B virus (HBV), Hepatitis B surface antigen (HBsAg), Enzyme linked Immunosorbent assay (ELISA).

INTRODUCTION

Hepatitis B virus is the most widespread and the most important type among viral hepatitis. Hepatitis B virus was discovered by Blumberg in 1965. It was discovered by chance when Blumberg and colleagues while studying human serum lipoprotein allotypes observed an Australian aborigine, an antigen that gave line of precipitation with sera from two hemophiliacs with history of blood transfusions.[1]

About 240 million people remain infected chronically and 780,000 deaths from HBV related liver diseases, including end stage cirrhosis and hepatocellular carcinoma occur each year.[2] Hepatitis B virus is a hepatotropic DNA virus and belongs to family *Hepadnaviridae*, genus *Orthohe padnavirus*. HBV is a 47 nm spherical virus with an outer envelope and an inner core of 27 nm in diameter, enclosing viral genome and a DNA polymerase. Under electron microscope serum of patients with hepatitis B infection shows three types of particles.

HBV is transmitted by multiple routes. In developing countries, the most common mode of transmission is via blood and blood products transfusion and needle prick injuries, surgical and dental procedure or percutaneous inoculation via shared razors and tooth brushes. In developed countries sexual transmission is found to be the most common route; particularly homosexual male being at higher risk.[1]

MATERIAL AND METHODS

This was a prospective, cross-sectional study done on pregnant women attending antenatal clinic in Department of Microbiology in M.G.M. Medical College Indore from June 2021 to June 2022. Pregnant women of reproductive age group were included in the study. After collection of 5ml of venous blood from the patients, serum was separated by centrifugation. They were then tested for Hepatitis B surface antigen (HBsAg) by Rapid test using Rapid card test (Lateral flow) and ELISA (Enzyme Linked Immunosorbent Assay) test using TRUST well HBsAg kit.

RESULTS

Total 610 samples were received and tested for HBsAg detection by Rapid test at Department of Microbiology, M.G.M. Medical College, Indore (M.P.). Out of which 12 were found to be positive by rapid antigen kit and were further confirmed by HBsAg ELISA test.

Table 1 showing age wise distribution of the HBsAg positive sample in the 6 samples were found to be positive out of 380 sample in the age group 18-25 years, 5 samples were found to be positive out of 212 in the age group 26-33 years and only 1 sample was found to be positive out of 18 samples.

Table 2 showing risk factors associated with HBsAg among HBsAg positive, higher number of samples was found with history of blood transfusion was found to be 5(41.66%), followed by tattooing (33.33%), followed by history of multiple sexual partners, HIV positive and family history of HBV infection which was 8.33%,8.33% and 8.33% respectively.

Table 1: Age-wise Distribution Of Hbsag Positive By Elisa

AGE GROUP (in years)	TOTAL (%)	POSITIVE (%)	NEGATIVE (%)
18-25	380 (100%)	6 (1.58%)	374 (98.42%)
26-33	212 (100%)	5 (2.35%)	207 (97.64%)
>33	18 (100%)	1 (5.55%)	17 (94.44%)
TOTAL	610 (100%)	12 (1.97%)	598 (98.03%)

Table 2: Associated Risk Factors Of Hepatitis B Infection

RISK FACTORS	HBsAg Positive (%)	HBsAg Negative (%)
H/o blood transfusion	5 (41.66%)	15 (2.50%)
H/o Multiple sexual partner	3 (25%)	0
HIV positive	1 (8.33%)	3(0.5%)
H/o surgery	1 (8.33%)	180 (30.10%)

Occupation exposure to blood/body fluids	0	0
H/o of injection for therapeutic purposes	0	400 (66.9%)
Tattooing	4 (33.33%)	60 (10.03%)
H/o Invasive dental procedure	0	5 (0.83%)
Family H/o HBV infection	1 (8.33)	20 (3.34%)

DISCUSSION

The World Health Organization (WHO) has classified HBV prevalence into high endemicity (>8%), intermediate (2-7%) and low endemicity (<2%)[3]. India is currently in the intermediate endemicity zone with a prevalence of 2–7% (average 4%), and a disease burden of approximately 50 million. Recent studies have reported HBsAg positivity among pregnant women ranging from 0.8 to 1.1%[4]

Higher percentage of HBsAg positive was found in age group 18-25 years i.e, 50% in this study, followed 41.60% in the age group 26-30 years, 8.33% in the age group 31-35 years, similar results were found in the studies done by Reeta S *et al* in the Eastern UP where they found 52% women were in the age-group 20–25 years, 40% in the age-group 26–30 years, 4.6% in the age-group 31–35 years, and 2% in the age-group 36–40 years, India [6] and Neha Samal *et al* in the Southern Odisha, India found that the most common age group showing Hepatitis B virus antigenemia (HBsAg positivity) was 18 – 25 years(5.47%), the mean age being 21.5 years [2]. While a study done by Dr. Vidyut Prakash *et al* found highest prevalence in the age group 26-33 years (50 %), followed by the age group 18- 25years (33.3%), followed by the age group 33-40years (16.7%) [5]. While in the study done by Mehta K *et al* highest prevalence was found in age group 21-25 years (53.3%) followed by age group 26-30 years (33.3%), age group 17-20 and age more than 30 years (6.7%) [7]

The associated risk factors found in this study (Table 2) were history of blood transfusion, tattooing/piercing, history of surgery, multiple sexual partners, HIV positive, Family history of HBV positive. Out of which blood transfusion was found to be significant risk factor. This was similar to the study done by Getnet Gedefaw *et al* where having a history of blood transfusion was an independent risk factor for hepatitis B virus infection. [8]. Reeta Singh *et al* in the Eastern UP in their study found tattooing as significant risk factor. Body tattooing is a traditional practice in India [6]. In another study done by Bedru Argaw *et al* history of blood transfusion and contact with a family history of the liver were found to be significant independent predictors of HBV infections [9]. In contrast, the study done by Belete Bancha *et al*, participants with history of hospitalization after surgery were three times more likely to acquire HBV infection [10]. And in other study done by Mohammed Awole *et al* found that having history of abortion increased the risk of having HBV infection more than twice as compared with those who had not suffered such experience [11].

CONCLUSION

HBV can be transmitted efficiently from pregnant mothers to their new born, particularly if the mother has a high viral load. This transmission may occur either in utero, during birth, or in the period after delivery. Since HBV infection in infancy is much more likely to become chronic and hence lead to liver cirrhosis or liver cancer, prevention of HBV infection is focused particularly on such transmission. In this study the most common associated risk factor for Hepatitis B infection in pregnant women was found to be blood transfusion, followed by tattooing, followed by H/O multiple sexual partners, followed by HIV positive, H/O surgery, family H/O HBV infection. Immunization is the most effective and only way of preventing development of chronic carrier state. Hence all neonates were administered with hepatitis B vaccine and 0.5 ml of hepatitis B immunoglobulin within 12 hours of birth.

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