

A RETROSPECTIVE STUDY OF RISK FACTORS FOR HEPATITIS B INFECTIONS AMONG THE PATIENTS IN A TERTIARY CARE HOSPITAL

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Abstract

Introduction: Hepatitis C virus (HCV) infection is prevalent among patients who undergo maintenance hemodialysis (HD) and is a particular concern because of the high risk for chronic liver disease, complications in renal transplantation, and death in these patients. The prevalence of this infection is known to vary widely in different regions of the world. In India, a very wide range of prevalence rates for HCV (4.3-45.2%) in the HD population have been reported.

Materials and Methods: Health camps were organized in 2 randomly selected villages of all 17 subcentres of Jammu between June 2017 to January 2021. Villagers availed of general health check-ups and were offered a screening test for several diseases including HBsAg for HBV. HbsAg testing was done using standard Eliza kits. Positive samples were rechecked by different kits.

Results: Among 210 persons found HbsAg positive, 4 were excluded as per exclusion criteria. One did not turn up for the interview. Finally, 200 cases and 400 matching controls were identified as per the methodology enrolled for the study. Among the cases maximum (32%) were in the age group 20-30 years, 62% were males and 90% were married. Maximum no (55%) belonged to the lower social class followed by the lower middle class (32%). There was no significant difference between cases and controls concerning age, gender, marital status, and social class ($p \geq 0.05$). H/o jaundice 6 months ago or more in past in 52% of cases and 25% of

controls ($p=0.00$, $OR=3.58$); contact with hepatitis B in 18% of cases vs 5% controls ($p=0.00$, $OR=4.17$), family history of Hepatitis B in 32% cases and 8% controls ($p=0.00$, $OR=5.41$) was present.

Conclusion: Several social, environmental and behavioral risk factors were significant in the transmission of HBV in rural agricultural workers who form the bulk of the population in Jammu. However target population for preventive action identified in the study as migrants, persons with H/o jaundice, and their contacts for screening and follow-up. Migrants should undergo screening and efforts made to increase awareness.

Key Words: Hepatitis C virus, hemodialysis, HbsAg, awareness.

INTRODUCTION

Hepatitis C virus (HCV) infection is prevalent among patients who undergo maintenance hemodialysis (HD) and is a particular concern because of the high risk for chronic liver disease, complications in renal transplantation, and death in these patients. The prevalence of this infection is known to vary widely in different regions of the world. In India, a very wide range of prevalence rates for HCV (4.3-45.2%) in the HD population have been reported.¹

India has “intermediate to high endemicity” for hepatitis B (HBsAg) with an estimated 40 million chronic HBV-infected people, constituting approximately 11 percent of the estimated global burden.²

The population prevalence of HBV infection in India is around 3-4 percent. Chronic HBV infection accounts for 40-50 percent of hepatocellular carcinoma and 10-20 percent of cases of cirrhosis in India.³

Demographic changes and expanded vaccination can create new epidemiological patterns of the virus which will have an impact on region-specific endemicity levels. Two-thirds of outbreaks were reported from rural areas by IDSP during 2011-2013 and 7% was due to hepatitis B or hepatitis C.⁴ There is wide variation in HBsAg prevalence in different geographical regions in India.⁵

Given the paucity of data regarding the many modes of transmission of HBV, it was aimed to study the risk factors operating in rural Jammu which could play a major role in reducing the prevalence.

MATERIALS AND METHODS

Study design: Retrospective case-control study design

Study locations: Gastroenterology super speciality Hospital, Govt Medical College, Jammu.

Study duration: January 2017 to January 2021.

Sample Size: 200 cases, 400 control.

Health camps were organized in 2 randomly selected villages of all 17 subcentres of Jammu between June 2017 to January 2021. Villagers availed of general health check-ups and were offered a screening test for several diseases including HBsAg for HBV. HbsAg testing was done using standard Eliza kits. Positive samples were rechecked by different kits.

All consenting adults above 20 years of age, testing positive for HbsAg in the health camps were selected as cases. Persons below the age of 20 years, having a chronic disease, seriously ill, and non-consenting were excluded from the study. Controls were chosen amongst other attendees of the health camp who were serologically negative for HBsAg but matched for age (± 3 years), sex, marital status, and social class using the updated BG Prasad method of social classification. Per capita income was calculated using the average consumer price index (CPI) Bihar 2014 for agricultural rural workers who formed our study population. Cases & controls were chosen in the ratio of 1:2 to increase the power of the study.

Data collection and tools

Following the health camp, the villages were revisited on a pre-fixed date by a team from GMC who administered a pre-tested structured questionnaire on all selected cases and controls. Data collected pertained to background characteristics of the participants, H/o jaundice 6 months ago or more in the past, contact with an HBV+ person, and family history of HBV. Risk factors for HBV related to health care services and personal behavior were enquired for and noted. Awareness about hepatitis B transmission and prevention were other variables studied.

Statistical analysis:

Data analysis was done using STATA 12.0. Levels of significance and odds ratio of risk factors were calculated at a 95% confidence interval. A P-value of less than 0.05 was considered to indicate statistical significance. Risk factors found significant were put to multiple regression model to determine which characters were independent predictors of hepatitis B.

RESULTS

Among 210 persons found HbsAg positive, 4 were excluded as per exclusion criteria. One did not turn up for the interview. Finally, 200 cases and 400 matching controls were identified as per the methodology enrolled for the study.

Parameter	Cases (n=200)	Control(n=400)
Age (in years)		
20-30	64 (32)	104 (26)
31-40	44(24)	84(21)
41-50	36(18)	86(19)
>51	52(26)	136(34)
Gender		
Male	124(62)	260(65)
Female	76(38)	140(35)
Marital status		
Single/widowed	20(10)	72(18)
Married	180(90)	328(82)
Socioeconomic status		
Upper class	0	0
Upper middle class	0	0
Middle class	26(13)	58(14.5)
Lower middle class	64(32)	140(35)
Lower class	110(55)	202(50.50)
H/O Jaundice		
Present	104(52)	100(25)
Absent	96(48)	300(75)
Contact with hep B		
Yes	36(18)	20(0.5)
No	164(82)	380(95)
Family history of Hep B		
Yes	64(32)	32(08)
No	136(68)	368(92)

Table 1: Patient demographic characteristics

Parameter	Cases (n=200)	Control (n=400)
(A) Related to health care services		
History of blood transfusion		
Yes	40(20)	16(4)
No	160(80)	384(96)

History of hospitalization		
Yes	88(44)	100(25)
No	112(56)	300(75)
History of surgery		
Yes	76(38)	88(22)
No	124(62)	312(78)
History of needle stick injury		
Yes	20(10)	0(0)
No	180(90)	400(100)
History of the dentist visit		
Yes	68(34)	124(31)
No	132(66)	286(69)
B. Related to personal behavior		
History of HRB#		
Yes	8(4)	0(0)
No	192(96)	400(100)
History of STD T/t		
Yes	24(12)	0(0)
No	176(88)	400(100)
History of ear nose piercing (female)		
Yes	64(84.2)	136(97.1)
No	12(15.8)	4(2.9)
History of shaving at barber ever (male)		
Yes	120 (96.77)	260(100)
No	4(3.23)	0(0)
History of migration		
Yes	60(30)	72(18)
No	140(70)	328(82)
C. Awareness of hepatitis B		
Heard about Hep B	104(52)	260(65)
Transmission through blood	80(40)	172(43)
Transmission through sexual contact	40(20)	92(23)
Knowledge about Prevention/	8(4)	52(13)

vaccination		
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Table 2: Risk factors of HBV transmission

Among the cases maximum (32%) were in the age group 20-30 years, 62% were males and 90% were married. Maximum no (55%) belonged to the lower social class followed by the lower middle class (32%). There was no significant difference between cases and controls concerning age, gender, marital status, and social class ($p \geq 0.05$). H/o jaundice 6 months ago or more in past in 52% of cases and 25% of controls ($p=0.00$, $OR=3.58$); contact with hepatitis B in 18% of cases vs 5% controls ($p=0.00$, $OR=4.17$), family history of Hepatitis B in 32% cases and 8% controls ($p=0.00$, $OR=5.41$) was present.

Risk factors for transmission of Hepatitis B were analyzed concerning (A) Health care services availed, (B) Personal behavior (C) Awareness of hepatitis B (Table 2).

DISCUSSION

History of jaundice more than 6 months ago, family history, and contact with hepatitis B patients were significantly related to seropositivity. Whereas 52% of cases in this study were preceded by jaundice >6 months ago, a study conducted in Italy reported 80% of cases were preceded by a history of jaundice. This points to a lack of follow-up after an episode of jaundice or in contact to Pre-empt the dreadful complications of HBV.⁶ It may be noted that 48% of cases did not report an earlier episode of jaundice (anicteric jaundice). Being asymptomatic may preclude detection and follow-up action hence a greater public health risk. The low status of the study population may be the cause of their inability to seek proper advice treatment for themselves and preventive vaccines for contacts.⁷

A family history of hepatitis B was significantly associated with cases in our study. Of the various modes of non-sexual horizontal transmission, intra-familial, in apparent transmission through saliva, blood-tinged fluid, and fluid from open sores, skin lesions, or scratches are common modes, especially in developing countries of the world. Our study corroborates that contact with chronic carrier predisposes the family members to the risk of developing Hepatitis B.⁸

Among healthcare service-related risk factors, a history of blood transfusion, hospitalization, surgery, and needle stick injury were significant risk factors for HBV infection. This has been corroborated by many other studies. Tandon et al observed that transfusion is one of the major routes of transmission in adults in India. However, it was not so in studies conducted in Iran and Saudi Arabia which concluded that the history of hospitalization and injections are given in healthcare settings were more important risk factors.

The history of exposure to either minor or major surgery is significantly associated with HBV infection in our study and also in others. The probable reason could be deficient sterilizing practices and hygiene in the hospitals frequented by our study population which presents a window of opportunity to reduce infection through the implementation of standard sterilization measures and infection control measures.⁹

Needle prick is one of the common modes of parenteral transmission. A study in rural Gujarat underlined the role of inadequately sterilized needles in the transmission of Hepatitis B. Similarly, a study in Uganda documented the risk factors involved with positive hepatitis serology in health workers and concluded needle stick injury as the most common risk factor. The predisposition to seropositivity following exposure to health care-related services can be attributed to ignorance about proper bio medical waste management among health workers and waste handlers across the country. Adherence to the standard protocols of biomedical waste management, and sterilization of instruments and equipment can help to reduce the incidence of hepatitis.¹⁰

CONCLUSION

Several social, environmental, and behavioral risk factors were significant in the transmission of HBV in rural agricultural workers who form the bulk of the population in Jammu. However target population for preventive action identified in the study as migrants, persons with H/o jaundice, and their contacts for screening and follow-up. Migrants should undergo screening and efforts made to increase awareness.

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