

A ANALYTICAL CASE CONTROL STUDY OF THE RISK FACTORS OF HEPATITIS B AMONG ADULT RURAL POPULATION IN A TERTIARY CARE HOSPITAL

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Abstract

Introduction: Hepatitis B is a potentially life-threatening liver infection induced by the hepatitis B virus (HBV), which is an enveloped deoxygenated ribonucleic acid (DNA) virus. It is an important global health problem that causes chronic infection and increases the risk of dying from cirrhosis and liver cancer. It can range from asymptomatic infection or mild disease to severe or rarely fulminant hepatitis.

Materials and Methods: Analytical case control study design was used to study risk factors responsible for transmission of Hepatitis B in the villages of Telangana state which is the field practice area of the Department of Community Medicine, Osmania Medical College, Koti, Hyderabad, Telangana. It was part of a rural screening programme using health camp approach. Health camps were organized in 2 randomly selected villages of all 17 subcentres of rangareddy district between January 2023 to September 2023. Villagers availed general health check-up and were offered screening test for several diseases including HBsAg for HBV. HbsAg testing was done using standard Eliza kits at laboratory. Positive samples were re-checked by different kit.

Results: Among 52 persons found HbsAg positive, 2 were excluded as per exclusion criteria. One did not turn up for the interview. Finally 5 OMC 0 cases and 100 matching controls identified as per methodology enrolled for the study. Among the cases maximum (32%) were in age group 20–30 years, 62% were males and 90% were married. Maximum no (55%) belonged to lower social class followed by lower middle class (32%). There was no significant difference between cases and controls with respect to age, gender, marital status and social class ($p \geq 0.05$). H/o jaundice 6 months ago or more in past in 52% cases and 25% of controls ($p=0.00$, $OR=3.58$); contact with hepatitis B in 18% 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 behavioural risk factors were significant in transmission of HBV in rural agricultural workers who form the bulk of the population in Telangana. 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. Our study shows that non sexual horizontal transmission such as persistent contact with a chronic carrier though less known than other modes also occurs in Telangana. This observation needs to be studied further. Against the convention of screening for HBV in STD clinics, camp approach is more suitable for rural populations. Improving infection control in our rural hospitals is a priority.

Key Words: Hepatitis B, HbsAg, jaundice, deoxygenated ribonucleic acid.

INTRODUCTION

Hepatitis B is a potentially life-threatening liver infection induced by the hepatitis B virus (HBV), which is an enveloped deoxygenated ribonucleic acid (DNA) virus. It is an important global health problem that causes chronic infection and increases the risk of dying from cirrhosis and liver cancer. It can range from asymptomatic infection or mild disease to severe or rarely fulminant hepatitis.¹

The hepatitis B virus is a highly contagious disease, which is 50–100 times more contagious than the human immunodeficiency virus (HIV), and 10 times more contagious than the hepatitis C virus. Many carriers of the hepatitis B virus are unaware of their infection and are therefore referred to as “silent killers”.² The virus is highly contagious that can be transmitted from mother to child and through contact with contaminated body fluids such as unprotected sex, contaminated medical equipment and blood donations.³

Although HBV has considerable morbidity and mortality, it can be prevented by awareness and vaccination. The vaccine against hepatitis B is 95% effective in preventing infection and hence development of chronic liver disease and cancer. WHO recommended global vaccination against hepatitis B in 1992.⁴ From 2002 till 2012, Government of India included hepatitis B vaccine in its National Universal Immunization Programme all over the country in phased manner. This is likely to reduce HBV carrier state from 4 to 1.15%. However it is an optional vaccine for adults.⁵

The main objective of this study to study of the risk factors of hepatitis b among adult rural population in a tertiary care hospital.

MATERIALS AND METHODS

Analytical case control study design was used to study risk factors responsible for transmission of Hepatitis B in the villages of Telangana state which is the field practice area of the Department of Community Medicine, Osmania Medical College, Koti, Hyderabad, Telangana.

It was part of a rural screening programme using health camp approach. Health camps were organized in 2 randomly selected villages of all 17 subcentres of rangareddy district between January 2023 to September 2023. Villagers availed general health check-up and were offered screening test for several diseases including HBsAg for HBV. HbsAg testing was done using standard Eliza kits at Laboratory. Positive samples were re-checked by different kit.

Study participants: 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 chronic disease, seriously ill, and non-consenting were excluded from the study. Controls were chosen amongst other attendees of health camp who were serologically negative for HBsAg but matched for age (± 3 years), sex, marital status and social class using updated BG Prasad method of social classification. Cases & controls were chosen in ratio of 1:2 to increase power of the study. Data collection and tools Following the health camp, the villages were revisited on a pre-fixed dates by team from OMC who administered apre-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 HBV+person, and family history of HBV. Risk factors for HBV related to health care services and personal behaviour were enquired for and noted. Awareness about hepatitis B transmission and prevention were other variables studied.

Data analysis was done using STATA 12.0. Levels of significance and odds ratio of risk factors calculated at 95% confidence interval. 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 52 persons found HbsAg positive, 2 were excluded as per exclusion criteria. One did not turn up for the interview. Finally 50 cases and 100 matching controls identified as per methodology enrolled for the study.

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

Variable	Cases (N=50)	Cases (N=100)	P Value
	N (%)	N (%)	

Age in years			
20-30	16 (32)	26 (26)	0.460
31-40	12 (24)	21 (21)	
41-50	9 (18)	19 (19)	
>51	13 (26)	34 (34)	
Gender			
Male	31 (62)	65 (65)	0.610
Female	19 (38)	35 (35)	
Marital status			
Single/widowed	5 (10)	18 (18)	0.120
Married	45 (90)	82 (82)	
History of Jaundice			
Present	26 (52)	25 (25)	0.001
Absent	24 (48)	75 (75)	
Contact with Hepatitis B			
Yes	9 (18)	5 (5)	0.001
No	41 (82)	95 (95)	
Family History of Hepatitis B			
Yes	16 (32)	8 (08)	0.001
No	34 (68)	92 (92)	

Table 1: Patient demographics

Variable	Cases (N=50)	Cases (N=100)	P Value
	N (%)	N (%)	
History of blood transfusion			
Yes	10 (20)	4 (4)	0.001
No	40 (80)	96 (96)	
History of hospitalization			
Yes	22 (44)	25 (25)	0.003
No	28 (56)	75 (75)	
History of surgery			
Yes	19 (38)	22 (44)	0.002
No	31 (62)	78 (78)	
History of needle stick injury			
Yes	5 (10)	0 (0)	0.001
No	45 (90)	100 (100)	
History of dentist visit			
Yes	17 (34)	31 (31)	0.002

No	33 (66)	69 (69)	
History of STD			
Yes	6 (12)	0 (0)	0.003
No	44 (88)	100 (100)	
History of ear nose piercing(female)			
Yes	16 (84.2)	34 (97.1)	0.004
No	3 (15.8)	1 (2.9)	
History of shaving at barber ever(male)			
Yes	30 (96.77)	65 (100)	0.005
No	1 (3.23)	0 (0)	
History of migration			
Yes	15 (30)	18 (18)	0.006
No	35 (70)	82 (82)	
Awareness about hepatitis B			
Heard about Hep B	26 (52)	65 (65)	0.03
Transmission through blood	20 (40)	43 (43)	0.65
Transmission through sexual contact	10 (20)	23 (23)	0.55
Knowledge about Prevention/ vaccination	2 (4)	13 (13)	0.082

Table 2: Factors associated with hepatitis B

It was observed that 20% cases had history of transfusion of blood or blood products while only 4% controls ever had transfusion. The observed difference was significant ($p=0.00$, $OR=6$). Forty-four% cases and 25% controls gave history of hospitalization ($p=0.001$, $OR=2.36$). Difference of proportion between cases (38%) and controls (22%) was significant with respect to H/o past surgery ($p=0.003$, $OR=2.17$). Only 10% of the cases and none of the controls gave history of needle stick injury, hence the difference was significant ($p=0.00$). The study didn't report significant difference in history of visit to dentist between cases and controls.

Fifty-two percent cases and 65% controls knew about hepatitis B ($p<0.030$); 40% cases and 43% controls were aware of its transmission through blood and blood-products; 20% cases vs23% controls knew it was transmitted sexually; 4% cases vs13% controls knew about preventive vaccination against hepatitis B.

DISCUSSION

History of jaundice more than 6 months ago, family history and contact with hepatitis B patient were significantly related to seropositivity. Whereas 52% cases in this study were preceded by

jaundice >6 months ago, a study conducted in Italy reported 80% of cases were preceded with history of jaundice. This points to lack of follow up after an episode of jaundice or in contacts to pre-empt the dreadful complications of HBV.⁷ It may be noted that 48% cases did not report 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 vaccine for contacts. Family history for 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.⁸

Our study corroborates that contact with chronic carrier, predisposes the family members to the risk of developing Hepatitis B. Among health care service related risk factors, past 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 of in adults in India. However, it was not so in studies conducted in Iran and Saudi Arabia which concluded that past history of hospitalization and injections given in health care 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 and presents a window of opportunity to reduce infection by implementation of standard sterilization measures and infection control measures. Needle prick is one of the common modes of parenteral transmission.⁹

A study in rural Gujarat underlined the role of inadequately sterilized needles in transmission of Hepatitis B. Similarly, a study in Uganda documented the risk factors involved with positive hepatitis serology in health workers, 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 the health workers and waste handlers across the country. Adherence to the standard protocols of biomedical waste management, sterilization of instruments and equipment can help to reduce incidence of hepatitis. Sexual promiscuity, intravenous drug abuse, homosexuality are risk behaviours predisposing to increased risk of HBV. Since the study was conducted in a conservative rural set-up the participants rarely responded to this question. Only 4% of our study population admitted to high risk behaviour which became significant. A cross-sectional study conducted in Southern Iran reported that unsafe sex exposes a person to higher-than average probability of acquiring HBV. Twelve percent of our study population admitted to have been treated for sexually transmitted diseases (STDs).

A study done in Mwanza, by Jacob et al concluded that there is high prevalence of HBV in STD patients. However, in this conservative rural population, health camps would give better yield in screening for STDs, as a proxy for high risk behaviour.¹⁰

CONCLUSION

Several social, environmental and behavioural risk factors were significant in transmission of HBV in rural agricultural workers who form the bulk of the population in Telangana. 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. Our study shows that non sexual horizontal transmission such as persistent contact with a chronic carrier though less known than other modes also occurs in Telangana. This observation needs to be studied further. Against the convention of screening for HBV in STD clinics, camp approach is more suitable for rural populations. Improving infection control in our rural hospitals is a priority.

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