

Risk Factors of Hepatitis B Infection Among Patients In Tertiary Care Hospital, Kurnool

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Abstract:

Introduction: Hepatitis B is a national and global public health problem. In 2013, viral hepatitis was a leading cause of death worldwide.¹ More than 90% of this burden is due to the sequelae of infections with the hepatitis B virus and hepatitis C virus. Prevention can reduce the rate of new infections. In the absence of additional efforts, 19 million hepatitis-related deaths are anticipated from 2015 to 2030.¹

Materials and Methods: We conducted a case control study among patients attending the Gastroenterology Department of Kurnool Medical College, Kurnool, AP. It is a tertiary care hospital and hence the patients from the peripheral areas of the state and neighbouring states are coming here.

Data were collected after getting written consent from the respondents. Information collected includes background demographic, socio-economic and health aspects.

Results: The determinants of transmission of Hepatitis B was found statistically significant which included sex, religion, socio-economic status, education, 'other related risk factors' which include earlier infection of HBV, diabetic and family history of hepatitis infection.

Conclusion: There is a need to create awareness about determinants and transmission of Hepatitis B in this area. The vaccination against Hepatitis B should be strongly recommended for high risk groups like family history of infection. Majority of the respondents are not immunized. Since the disease is highly infective but preventable, awareness and prevention are factors of importance.

Key words: Hepatitis B, Transmission.

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I. Introduction

Hepatitis B is a national and global public health problem. In 2013, viral hepatitis was a leading cause of death worldwide.¹ More than 90% of this burden is due to the sequelae of infections with the hepatitis B virus and hepatitis C virus. Prevention can reduce the rate of new infections. In the absence of additional efforts, 19 million hepatitis-related deaths are anticipated from 2015 to 2030.¹

India has "intermediate to high endemicity" for hepatitis B (HBsAg) with an estimated 40 million chronic HBV infected people, constituting approximately 11 per cent of the estimated global burden.² Population prevalence of HBV infection in India is around 3-4 percent.³ Chronic HBV infection accounts for 40-50 per cent of hepatocellular carcinoma and 10-20 per cent cases of cirrhosis in India.³

Demographic changes and expanded vaccination can create new epidemiological patterns of the virus which will have 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.³

II. Materials And Methods

Study Design

We conducted a case control study among patients attending the Gastroenterology Department of Kurnool Medical College, Govt General Hospital, Kurnool, AP. It is a tertiary care hospital and hence the patients from the peripheral areas of the state and neighbouring states are coming here.

Data were collected after getting written consent from the respondents. Information collected includes background demographic, socio-economic and health aspects.

Sample Patients

Based on a pilot study done in the selected department, we have calculated the sample size as follows: $n = z^2pq/d^2$ where n = sample size, z = standard deviation (1.96), p = prevalence, $q = 1-p$ and d = degrees of freedom (0.05), and assuming a prevalence of 13% based on the most recent Hepatitis B surface Antigen prevalence for the study setting which is a super speciality hospital. At 95% confidence level, the sample size is calculated to be 434. Hence, the final sample size is fixed as 500. We conducted the survey for three months during 2012. Since the hospital we selected is a referral one, more cases than controls are seen. The patients coming to the hospital are mostly referred from other hospitals in kurnool district and nearby districts and AP state. So mostly the serious cases are referred to the hospital and hence the chance to be positive HBsAg is higher. Thus, during the period we got a total sample of 500, of which 109 are controls and 391 are cases. Case group are those who are found positive for HBsAg. Controls are identified from the patients attending same OP with any diagnosis other than hepatitis and with no jaundice on the same day of confirmation of diagnosis of the HBV case patients. Hence, it is a case-control study. Besides socio-demographic variables, the variables associated with risk factors included reuse of the syringes, blood transfusion, surgical procedure, dental procedure, accident and blood loss, parenteral drugs and drips, ear and nose piercing, tattooing, getting shaved and hair cut from barbers, sharing of tooth brush, family history of hepatitis, extramarital sexual contacts and immunization against Hepatitis B.

Risk factors were grouped into three categories based on exposure patterns. The first group included exposures associated with health care, such as receiving a blood transfusion, receiving an injection, visiting a dentist and exposure to any invasive procedure during the last 6 months including surgery, dialysis, wound and accidents. The second group of exposures included personal practices that might be associated with infection such as extra or premarital relationship, being shaved at a community barber and drug use, consumption of alcohol and smoking. The third group of risk factors included other risk factors such as being diabetic, having household contacts with hepatitis and have an earlier infection and being immunized.

Univariate and multivariate analyses were conducted and logistic regression is performed to identify risk factors independently associated with the risk of acquiring disease. Final step of Backward LR method of Logistic regression is interpreted as risk factors. Data analysis was done through SPSS version 13. For variables that might influence the occurrence of acute HBV, we calculated odds ratios (OR) and the P-value of < 0.05 is considered statistically significant. Ninety-five percent confidence limits of values are calculated.

III. Results

Characteristics	Case with HBsAg positive	Control with HBsAg negative	
Age	<20	3.2	2.6
	21-30	17.5	14.2
	31-40	24.6	27.9
	41-50	30.2	28.4
	51-60	16.5	12.6
	61-70	3.2	9.0
	>70	3.5	4.8
Age (mean ± SD)	41.23±12.2	43.7±13.75	
Sex	Male	72.5	53.6
	Female	27.7	46.7
Religion	Hindu	61.1	73.4
	Muslim	19	9.2
	Christian	18.9	17.4
Caste	SC/ST	8.6	10.1
	OBC/OEC	52.2	47.7
	Forward	21.5	28.4
	Others	17.6	13.8
Residence	Urban	25.1	35.8
	Rural	68.5	57.8
	Coastal	6.4	6.4
Education	Professional	2.5	5.3
	Graduation	10.2	24.8
	Intermediate	18.5	11.5
	High school	39.2	32.1
	Middle School	19.6	8.2
	Primary	7.6	13.7
	Illiterate	1.7	3.7
	Type of house	Pucca	41.8
Semi pucca		34.5	22.2
Kutchra		23.2	9.1
	Professional	13.0	13.8
	Semi Professional	11.3	9.2
	Clerical	12.5	14.7

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occupation	Skilled person	16.1	19.3
	Semi skilled worker	18.2	8.3
	Unskilled worker	12.2	16.5
	Unemployed	16.5	18.3
Diabetic	Yes	8.4	15.6
	No	91.6	84.4
Drug Use	Yes	2.0	0
	No	98.0	100
Alcohol Consumption	Yes	37.6	23.8
	No	61.5	76.1
Frequency	Daily	45.7	65.3
	Sometimes	50.3	26.6
	Rarely	4.0	7.7
Extra/Premarital relationship	Yes	4.2	1.7
	No	95.2	95.3
Immunization status against HBV	Yes	0	33.2
	No	100	67
Earlier infection HBV	Yes	25.2	6.4
	No	74.5	93.5
Total		191(78.4)	109(21.6)

Table 1. Socioeconomic and Demographic Characteristics and Personal Practices of the Patients

Risk factors	HBsAg Status		Total	
	Positive	Negative		
Hospital or healthcare related risk factors				
Undergone blood investigation	Yes	83.3	90.5	121
	No	15.5	7.3	28
When blood investigation	Within six months	62.4	74.3	87
	Before six months	37.6	18.3	43
Whether disposable syringe used	Always	26.7	59.4	47
	Sometimes	30.3	10.9	21
	No	40.0	29.7	32
Received injection of any kind	Yes	41.6	56.8	26
	No	58.2	42.2	74
When received injection	Within six months	60.1	54.0	32
	Before six months	39.8	47.0	76
Ascertained disposal syringe	Always	25.2	60.2	69
	Sometimes	12.3	7.9	25
	No	62.5	31.8	122
Blood transfusion of any reason	Yes	31.6	24.8	51
	No	68.5	75.2	149
When blood transfusion	Within six months	50	25.9	69
	Before six months	50	74.1	82
When blood donation	Within six months	56.5	77.5	24
	Before six months	43.5	22.2	25
Accident and blood loss	Yes	30.7	11.9	33
	No	69	88	67
When accident	Within six months	46.7	15.4	56
	Before six months	53.4	84.5	75
Undergone surgical procedure	Yes	42.7	36.7	107
	No	57.3	62.4	293

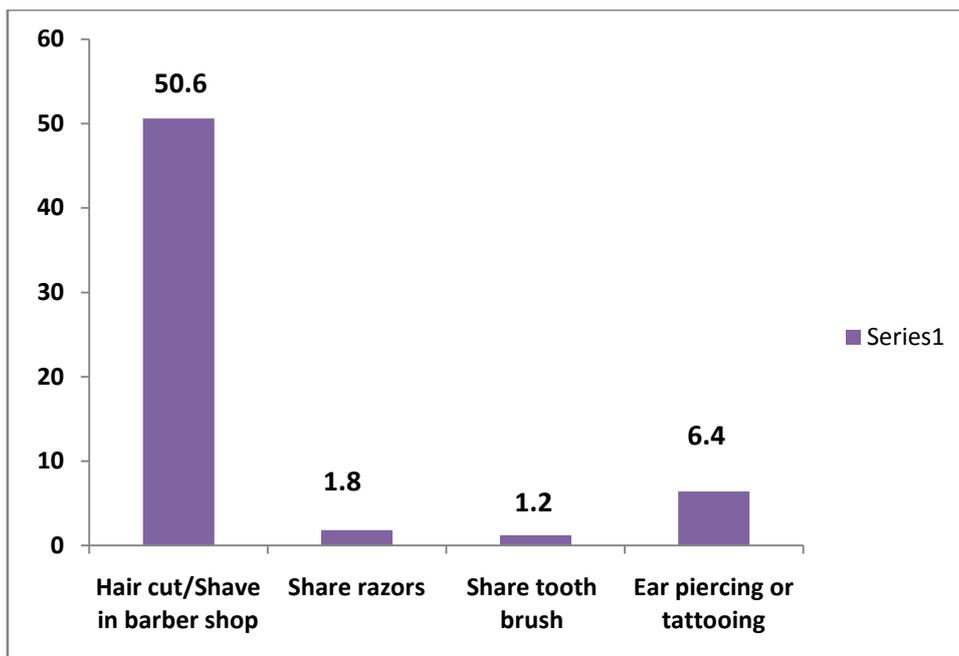


Figure 1: Exposure of Personal Practices of Risk Factors

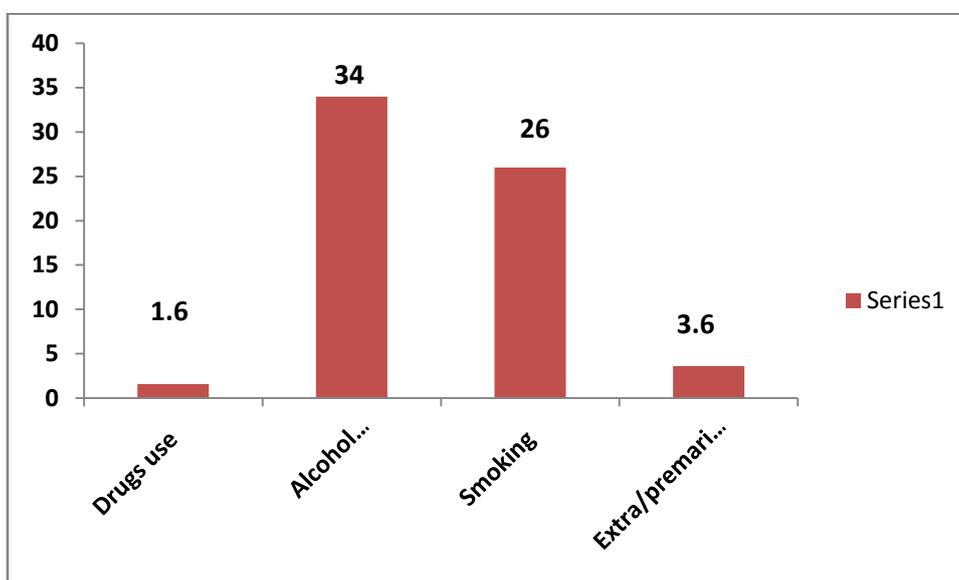


Figure 2: Exposure to Personal Behavioural Risk Factors

IV. Discussion

The study has elucidated the factors of HBV infection by analysing data of 500 patients attending OP unit in Kurnool Medical College, Kurnool, AP during 2017-2018. Out of the 500 patients, 391 are HBsAg positive (cases) and 109 are HBsAg negative patients (controls). Asymptomatic individuals referred to the unit from other peripheral hospitals or clinics during the study period are the respondents. The cases are patients with various forms of liver disease who tested positive for Hepatitis B surface (HBsAg) and controls are patients with HBsAg negative attending the same OP. The control subjects are matched for age and sex with cases.

In the study, it is revealed that the patients with HBV and controls (with HBsAg negative) have equal mean age and age at marriage and are almost equally distributed among age groups. Among males more are in HBsAg positive group, but females are equally distributed in the two groups. Religious composition reveals that HBV patients are more among Muslim population, but wide variation in percentages in Hindus which is more in control group. Behaviours negatively associated with health like consumption of alcohol, smoking and drug use are more among case group (with HBV positive) than among controls (with HBsAg negative).

Analysis reveals that majority of the respondents are not immunized. Since the disease is highly infective but preventable, awareness and prevention are factors of importance. It is also revealed that 10 percent of the respondents in the study are diabetic and they require blood investigations more frequently which is a risk factor of spreading the virus. In a society like AP where lifestyle diseases are higher and majority of these people are utilising health care facilities, chance of transmission through blood is more. Private labs and clinics should be monitored whether safety is ensured in lab tests and injections. Transmission results from exposure to so many factors like infectious secretions, needles, unprotected sexual contacts and vertical transmission from mother to child during child birth etc. This case control study with HBV infection revealed that several high-risk behaviours and practices for the transmission of this infection are significantly more prevalent among the HBV positive patients compared to the controls. This means that parenteral transmission of HBV through these high-risk activities may have substantial contribution to disease burden. But multivariate analysis shows that one indexed variable namely other related risk factor which is a combination of 'earlier infection of HBV, being diabetic and family history of HBV' is significantly related with infection of HBV. Bivariate analysis shows that controls (HBsAg negative group) are more diabetic than cases (HBV patients) and being undergone blood investigations are more among controls than cases. This shows that this variable (being diabetic) is not associated with risk exposure. Other two variables are earlier infection and had a family history are more among cases than controls. Hence, these variables are significantly associated with virus infection. Health care related factors like history of renal dialysis, blood investigation, blood transfusion, ever had donated blood, had met an accident and blood loss, undergone a surgical procedure, dental procedure, parenteral drugs and drips are not significantly associated with HBV infection may be due to the effective infection control functions of the hospital. A study in the same hospital settings reported that reuse of needles was found to be the most important risk factor of the acquisition of hepatitis B20. The findings of such studies have perhaps led to the effective control of such factors in the control group. There were more instances of family

V. Conclusion

The study revealed that there were more instances of family history of liver disease among the cases compared to the controls. Hepatitis B virus infection has long been recognized to exhibit horizontal transmission among parents, children, siblings and other house-hold members. Immunization status has revealed that case group had no one immunized, which shows the importance of the stressing vaccination against Hepatitis B. Transmission through blood pathogens is relatively weak in the model, which implies better and developed health care practices in this area.

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