A STUDY OF THE RISK FACTORS OF HEPATITIS B AMONG ADULT RURAL POPULATION OF PHULWARI SHARIF BLOCK, PATNA

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ABSTRACT

BACKGROUND

Hepatitis B is a major public health problem. Approximately, 30% of world's population or about 2 billion persons have serological evidence of either current or past infection with this DNA virus. India, with 2-8% carrier rate contributes to nearly 10% of the HBV carrier in the world.

Aims and Objectives- 1. To study the risk factors of Hepatitis B in adult population living in rural areas of Phulwari Sharif Block, Patna. 2. To study the association and appropriate intervention or public health programme based on study finding.

MATERIALS AND METHODS

To better define risk factors associated with HBV transmission, we conducted a case–control study consisting of all the adult attendees to the 34 health camps conducted during the study period from June 2012 to May 2013 in each of the 2 randomly selected villages of each subcentre of Phulwari Sharif Block, Patna.

RESULTS

During the study period of one year, 54 cases were identified as HBsAg positive out of 150, in which 4 cases did not give the consent to participate in the study from among those screened. 100 controls were selected after matching, and enrolled for the study.

CONCLUSION

The study was an effort to highlight the main risk factors that lead to Hepatitis B virus infection. The present study shows that the known risk factors are also significant in the transmission of Hepatitis B in Bihar.

KEYWORDS

Hepatitis, Risk Factor.

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BACKGROUND

Hepatitis B virus (HBV) infection is a serious global public health problem with an estimated 2 billion people infected worldwide and 350 million persons with chronic HBV infection. The World Health Organization estimates that 500,000 to 1.2 million deaths occur each year due to HBV related chronic liver disease, and that cirrhosis of the liver and primary hepatocellular carcinoma associated with HBV infection is the 10th leading cause of death worldwide. HBV related hepatocellular carcinoma (HCC) is the 5th most frequent cancer worldwide.[1]

The epidemiology of HBV transmission is complex. Transmission occurs in all age groups associated with percutaneous and permucosal exposure to infectious body fluids from persons with acute or chronic HBV infection.

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The highest concentrations of HBV occur in blood and serous fluids, and infection most frequently occurs through direct inoculation of the virus through unsafe injections or reuse of contaminated medical equipment. Other common modes of transmission include sexual contact with infected persons and births from HBV-infected mothers.[2]

As India is in the intermediate endemic region, prevalence of hepatitis B in India among general population ranges from 0.1% to 11.7%, while it is between 2% to 8% in most studies. HBsAg prevalence rate among blood donors ranged from 1% to 4.7%. With the exception of higher HBsAg positivity in some North-Eastern states (~7%), no substantial geographical variation is apparent in other parts of India. Considering, on an average, HBsAg carrier rate of 5%, the total number of HBV carriers in the country is estimated to be about 50 million, that forms nearly 15% of the entire pool of HBV carriers in the world and is the second largest pool of chronic HBV infections in the world.[3] In patients who are suffering from chronic Hepatitis B, cumulative incidence of developing liver cirrhosis over a period of 5 years after diagnosis is 8–20%. Economic burden of treatment of these patients is huge not only for their families but also for health resources of the country.[4]

The Quantum of Risk Varies with Different Types of Exposure

a) **Needle Stick Injury**- If HBeAg is positive, then there is 37-62% risk if there is serologic evidence of infection in the recipient.[5]
b) **Blood Transfusion-** The rate of transmission is 52-69% if transfused with HBsAg positive blood.[6]
c) **Sexual Exposure-** The infection rate seen is 18-40% in regular partners of HBV infected people; increased risk if history of multiple partners, syphilis, gonorrhoea, receptive anal intercourse.[7]
d) **Other Percutaneous Injuries with Blood Exposure-** The transmission rates vary between 6- 15% if universal precaution are not followed.[8]
e) **Human Bites and Exposure to other Body Fluids (e.g. saliva)-** The risk is negligible by human bite in the absence of visible blood. The risk of transmission is very low by saliva. Studies report that if the source is HBeAg positive then they require risk assessment.[9]

Other factors reported to be associated with acquisition of hepatitis B virus infection include age, male gender, low level of education, and history of previous surgery, multiple sexual partner, HIV infection and nonusage of condoms.[10]

Public Health Importance

- Young children who become infected with the hepatitis B virus are most likely to develop chronic infections, 90% of infants infected during the first year of life develop chronic infections; 30-50% of children infected between one to four years of age develop chronic infections.
- In adults, 25% of adults who become chronically infected during childhood die from hepatitis B related liver cancer or cirrhosis. 90 % of healthy adults who are infected with the hepatitis B virus will recover and be completely rid of the virus within 6 months.[11]

MATERIALS AND METHODS

An analytic case control study was conducted consisting of all the adult attendees to the 34 health camps conducted during the study period from June 2012 to May 2013 in each of the 2 randomly selected villages of each subcentre of Phulwari Sharif block during the study period of one year, 54 cases were identified as HBsAg positive. Out of these, 4 cases did not give the consent to participate in the study. From among those screened, 100 controls were selected after matching, and enrolled for the study.

Test for Hepatitis B virus surface antigen (HBsAg) was done by ELISA. ELISA microplate Reader is manufactured by BioTek company. 2.5 mL of blood was taken by intravenous route and collected in labelled vials for each of the participants. The test for HBsAg was done in the PMCH Laboratory by ELISA Test. All the samples were subjected to test only once and samples testing seropositive for HBsAg by ELISA test were labelled as positive. Two controls were selected for each case and were matched by age, sex, religion, occupation, place of residence, educational status, marital status, and history of Hepatitis B virus vaccination.

Inclusion Criteria

Adults above 20 years of age visiting the health camps were included.

Exclusion Criteria

Persons below the age of 20 years, seriously ill and non-consenting persons.

Selection of Cases and Controls

Cases and controls were selected from the adult population living in rural area of Phulwari Sharif block, Patna.

Selection of Cases

Adults above 20 years of age residing in rural area of Phulwari Sharif who tested positive for HBsAg during the course of screening for other conditions by the doctors of Department of Community Medicine at PMCH, Patna.

Selection of Controls

Controls are taken from the same geographic area, from among those who were serologically negative for HBsAg and matched with respect to age, sex, religion, and geographic location.

Sample Size

During the study period of one year, 54 cases were identified as HBsAg positive. Out of those, 4 cases did not give the consent to participate in the study and 100 controls were enrolled for the study.

Data Collection

After selection of cases and controls, subjects were interviewed by a standard questionnaire. The questionnaire mainly covered the following areas: demographic characteristics of the participants, the source of Hepatitis B detection and vaccination status and Hepatitis B transmission determinants. In order to explore more on the mode of transmission, the Hepatitis B transmission determinants part was categorised into three parts-

1. The first was about health care services related determinants, such as receiving blood, invasive surgery (including major or minor), haemodialysis, dental visit, and hospitalisation.
2. The second was about the family source of infection, such as household contact with Hepatitis B carrier or jaundiced patient, family history of Hepatitis B.
3. The third division was about personal and community-based practices such as intravenous drug use, sharing shaving instruments, sharing toothbrush, shaving at barber shop, piercing, tattoos, history of jail (for more than three months), history of STD, and migrant from different region.

Prior to data collection, the questionnaire was pre-tested with a convenient sample of 10 candidates of the study population to ensure the clarity, time, and ease of administration. Refinements were made on the basis of feedback from the pre-test.

Data Analysis

Data collected were entered in Microsoft Excel, 2007 and analysis was done by SPSS Version 17.

- Descriptive statistics were computed for the demographic factors of the cases and the controls, and to assess the personal characteristics of the participants.

- Univariate analysis was performed with odds ratio (OR) calculated for risk factors with Chi-square test. Characteristics that were found, through univariate analysis, to be significantly associated with Hepatitis B infection were entered into a multivariate logistic regression model, to rule out the confounding factors and to determine which characteristics were independent predictors of Hepatitis B infection status of the participant, calculated for the all variables simultaneously.

Ethical Committee Approval

Approval for the study was obtained from the Institutional Research and Ethics Committee of Patna Medical College vide letter no-1917 of dated 29.05.2013, and conducted after informed consent was obtained from the participants.

- Confidence interval was set at 95%. P-value of less than 0.05 was considered to indicate st significance.

RESULTS

The study included 150 participants (50 cases and 100 controls) who agreed to participate in the study and interviewed with a standard questionnaire. The cases and controls were matched for age and sex.

A. Sociodemographic characteristics

Table 1 shows sociodemographic characteristics of participants. Among 150 cases, 64% of them were male and about 36% were female and in controls 65% were male and 35% were female. The most common age groups which were positive for HBsAg were between 30-35 years were about 32% in cases followed by >50 years about 26% and in control 26% and 34% respectively. 42% of cases were illiterate and among controls 39% were illiterate. Regarding the occupation, the majority of cases i.e. about 52% were labourers and among controls, 49% were of labour class population. Family size analysis showed 68% of cases having family size less than 5 and 63% of controls having family size less than 5. Regarding per capita income, 34% of cases having income less than 4000 per month and among controls 43% of participants having per capita income less than 4000 per month were included as subjects/controls. Nearly 90% of cases were married and among controls, 82% were married.

No statistically significant difference was observed between cases and controls with respect to sociodemographic characteristics, as the P-values were >0.05.

Variable	Case (n=50) Frequency (%)	Control (n=100) Frequency (%)	P- Value@	Total (n=150) Frequency (%)
Age				
20-30	16(32)	26(26)		42(28)
31-40	12(24)	21(21)		33(22)
41-50	9(18)	19(19)	0.738	28(18.7)
>50	13(26)	34(34)		47(31.3)
Sex				
Male	32(64)	65(65)		97(64.7)
Female	18(36)	35(35)	0.904	53(35.3)
Education level				
Illiterate	21(42)	39(39)		60(40)
Primary	9(18)	8(8)		17(11.3)
Secondary	13(26)	30(30)	0.208	43(28.7)
Intermediate	7(14)	23(23)		30(20)
Occupation				
Housewife	15(30)	31(31)		46(30.7)
Labourer	26(52)	49(49)		75(50)
Businessman	2(4)	3(3)		5(3.3)
Office employee	3(6)	3(3)	0.932	6(4)
Non-employee	4(8)	14(14)		18(12)
Marital Status				
Single	4(8)	11(11)		15(10)
Married	45(90)	82(82)		127(84.7)
Widow	1(2)	7(7)	0.200	8(5.3)
Family Size				
<5	34(68)	63(63)		97(64.7)
>5	16(32)	37(37)	0.447	53(35.3)
Per capita Income				
<2000	15(30)	10(10)		25(16.6)
<4000	18(36)	55(55)		73(48.6)
<6000	12(24)	26(26)	0.872	38(25.3)
<8000	5(10)	9(9)		14(9.3)

@ Chi-square test

Table 1. Distribution of Sociodemographic Characteristics of the Cases and Controls

B. Health Care Services Exposure Risk Factors

Table 2 shows univariate analysis regarding health care service related risk factors. To explore the risk factors between cases and controls, many health care services exposure factors were studied, such as; history of blood transfusion, history of surgery (including major or minor), dental visits, and history of hospitalisation.

Variable	Case (n_50) (Frequency) (%)	Control (n_100) (Frequency) (%)	p- value	OR (95% C.I)
History of Blood Transfusion Yes No	 10 (20) 40 (80)	 4 (4) 96 (96)	 0.004*	 0.17 (0.05-0.56)
History of surgery (Major or minor) Yes No	 20(40) 30(60)	 22(22) 78 (78)	 0.02	 0.42 (0.20-0.89)
History of dentist visit Yes No	 17 (34) 33 (66)	 31 (31) 69 (69)	 0.71	 0.87 (0.42-1.80)
History of hospitalisation Yes No	 22 (44) 28 (56)	 25(25) 75(75)	 0.02	 0.42 (0.21-0.87)
* Fisher's exact test				
Table 2. Univariate Analysis for the Health Care Service Exposure Risk Factors of Hepatitis B				

A significant relation was found between blood or blood product transfusion and Hepatitis B infection; 10 (20%) of the cases received blood (or any of its products) compared to 4 (4%) of the controls. This difference in proportions was found to be statistically significant, (P-value 0.004, OR=0.17).

Forty-two of the participants had a history of surgery in the past. Among those, 20 were cases and 22 were controls. This difference in proportions was found to be statistically significant, (P-value 0.02, OR=0.42).

Forty-seven participants had a history of hospitalisation. Among those, 22 were cases and 25 were controls, this difference in proportions was found to be statistically significant, (P-value 0.02, OR=0.42).

The univariate analysis did not show significant differences between cases and controls with regard to dental visit as the P-value was >0.05.

C. Personal behaviour related risk factor exposure

Table 3 shows personal behaviour related risk factor exposure. To explore the risk factors between cases and controls, several personal behaviour related risk factors were studied which included past treatment for STD, pre-used needle stick injury, ear/nose piercing, shaving at barber shop, contact with Hepatitis B patient, family history of Hepatitis B, history of migration and high risk behaviour.

Variables	Case (n_50) (Frequency) (%)	Controls (n_100) (Frequency) (%)	p- value	OR (95% of C.I)
History of STD Yes No	 6 (12) 44 (88)	 0 (0) 100 (100)	 0.002*	 0.04 (0.002-0.75)
Ear/Nose Piercing Yes No	 17 (34) 33 (66)	 34 (34) 66 (66)	 1.00	 1.00 (0.49-2.05)
History of pre-used needle stick injury Yes No	 5 (10) 45 (90)	 0 (0) 100 (100)	 0.01*	 19.68 (1.04-373.32)
History of Migration Yes No	 15 (30) 35 (70)	 18 (18) 82 (82)	 0.09	 0.0.51 (0.23-1.13)
High Risk Behaviour Yes No	 2 (4) 48 (96)	 0 (0) 100 (100)	 0.21*	 0.16 (0.01-4.0)
Family history of Hepatitis B Yes No	 16 (32) 34 (68)	 8 (8) 92 (92)	 0.0002	 5.41 (2.12-13.79)
Contact with HBV patient Yes No	 9 (18) 41 (82)	 7 (7) 93 (93)	 0.04	 0.34 (0.12-0.98)
Table 3. Univariate Analysis of Personal Behaviour Related Risk Factor of Hepatitis B				

* Fisher's exact test

Six of the participants had a history of treatment of STD in past, all of them were cases. This difference in proportions was found to be statistically significant, (P-value 0.002, OR=0.04).

Five of the participants reported being exposed to pre-used needle stick injury; all of them were among the cases. This difference in proportions was found to be statistically significant, (P-value 0.001, OR=0.05).

Sixteen of the participants had contact with the Hepatitis B patients in the past, and among these 9 were cases and 7 were controls. This difference in proportions was found to be statistically significant, (P-value 0.04, OR=0.34).

Family history showed 16(32%) of the Hepatitis B cases had a family member with history of Hepatitis B infection and 8(8%) of controls had a family member with history of Hepatitis B infection. This difference in proportions was found to be statistically significant, (P-value 0.0002, OR=5.41).

Thirty-three of the participants had a history of migration. Among these, 15 were cases and 18 were controls. However, these were not statistically significant (P-value 0.09, OR= 0.51).

The univariate analysis did not show significant differences between cases and controls with regard to ear/nose piercing, history of migration and high risk behaviour history as the P-value was >0.05.

D. Information about Awareness of Hepatitis B

Nearly 52% of cases had heard about hepatitis B virus transmission and its risk factors and 65% of controls had awareness about hepatitis B. About 52% of cases had history of jaundice in the past and 25% of controls reported history of jaundice in the past. 46% of cases and 18% of controls were tested for hepatitis B in the past, and of these 14 cases had tested positive for hepatitis B in the past.

Past history of jaundice is significantly associated with HBsAg positivity, as the P-value was<0.05. As far as vaccination was concerned, only 4% of cases were vaccinated with hepatitis B vaccine and 13% controls had been vaccinated with hepatitis B vaccine.

The risk factors was found significant in univariate analysis, and were put to regression model to determine which factors were independent predictors of hepatitis B infection status.

Binary Logistic-Regression Model

Table 4 shows the binary logistic regression of the risk factors, and shows significant association with the acquisition of Hepatitis B infection. The binary logistic regression model included history of jaundice, history of blood transfusion, past treatment of STD, contact with Hepatitis B patient, history of surgery, history of pre-used needle stick injury, history of hospitalisation and family history of Hepatitis B infection. Controlling for all above mentioned variable, Binary Logistic-Regression Model analysis showed Past history of jaundice and family history of Hepatitis B Virus infection were independently associated with Hepatitis B infection as the P-value was <0.05.

Variable	Case (%)	Control (%)	p- value	OR (95% of C.I)
History of Jaundice	26 (52)	25 (25)	0.011	5.33 (2.16-13.16)
History of Blood Transfusion	10 (20)	4 (4)	0.24	0.37 (0.07-1.99)
Treatment for STD	6 (12)	0	0.75	0.04 (0.002-0.75)
Contact with Hepatitis B patient	9 (18)	7 (7)	0.87	0.89 (0.24-3.40)
History of Surgery	20 (40)	22 (22)	0.57	0.70 (0.20-2.45)
History of pre-used needle stick injury	5 (10)	0	0.81	0.05 (0.03-0.96)
History of Hospitalisation	22 (44)	25 (25)	0.37	0.60 (0.20-1.84)
Family history of Hepatitis B infection	16 (32)	8 (8)	0.002	0.15 (0.45-0.51)

Table 4. Binary Logistic Regression Analysis for Hepatitis B Risk Factor

DISCUSSION

Hepatitis B is a major public health problem that incorporates high economic and social burden. However, it is often neglected because of its largely asymptomatic course with long-term complications. Since the infection has serious consequences, there is still a continuous need to examine its epidemiology so that we can formulate some prevention and control measures. The study was done with the purpose to identify the vulnerable population so that adequate control measures could be incorporated into the health system. The study design chosen was case control, so that significant differences could be identified in those having the risk factors and those who did not.

A. Sociodemographic Characteristics

Both case and control groups showed male predominance. Among cases, 64% of them were male and about 36% were female. In controls, 65% were male and 35% were female. It has been shown in the literature that males are at higher risk to develop Hepatitis B infection. No plausible explanation has been given for the higher prevalence in males in the general population but probably females clear the hepatitis B virus more efficiently as compared to males. Another important contributing factor responsible for a higher prevalence among the male population of the study is that plasma disappearance rate for HBsAg in males is lower than females.[12]

There are several studies conducted in Egypt, Turkey and Brazil that have shown that male was considered as a risk factor for HBV infection[13-15] In some studies conducted in Greece, Taiwan and Iran, one of the risk factors mentioned for HBV was male sex.[16-18]

In another study conducted in Taiwan, risk factors for HBsAg positivity were male sex, age 50 years, and a family history of hepatocellular carcinoma.[19]

The most common age group which were positive for HBsAg was between 20-30 years and there were about 32% cases, followed by >50 years (about 26%), while and in control 26% and 34% cases respectively. The majority of the

study population was young adults. This result may be due to the rising incidence of risk factors for hepatitis B infection toward the end of adolescence. Also, this is consistent with the allowed age range of blood donation and employment. This age coincides with the onset of high-risk behaviours, such as unsafe sexual practices and injecting drug use. Thus, we hypothesised that these high-risk behaviours are risk factors for infection.

Majority of the participants were illiterate. Among cases, 42% of them were illiterate and among controls 39% were illiterate. Study shows that educational level also has an important role in acquiring hepatitis B infection, though our study showed that this was not a significant risk factor.

Regarding the occupation, in a majority of cases about 52% were labourers and among controls 49% are from the labour class population. The higher incidences of hepatitis B in these populations were due to risky social activities or unhygienic living habits, and other factors. These factors may increase the risk of contact and rate of infection compared with others. These differences were correlated with a high infection rate, but further investigations are needed for better understanding the mechanisms of these relationships. In our study, 68% of cases had family size less than 5 and 63% of controls having family size less than 5.

Regarding per capita income, 34% of cases had income less than 4000 per month and among controls, 43% of participants had per capita income less than 4000 per month. Nearly 90% of cases were married and among controls, 82% were married. Results showed both case and controls were well matched, and hence comparable.

Our study did not show any significant difference in socio-demographic characteristics among case and controls, hence sociodemographic characteristics are not statistically significant in our study.

B. Health Care Services Exposure Risk Factors

The univariate analysis of the data identified history of blood transfusion, history of surgery, history of hospitalisation and past history of jaundice as risk factors for Hepatitis B infection.

Hospitalisation

Our study showed that history of hospitalisation is significantly associated with hepatitis B infection. About 22 cases had history of hospitalisation in the past. Duration of hospitalisation was also important in these cases, most of them had hospitalisation for more than 7 days.

A study done in India to assess the knowledge and the practice of the nurses and doctors toward the infection and prevention measures, showed the lack of both knowledge and practice, exposing the patients and themselves to nosocomial infection.[20] This is consistent with what have been shown in study done in different places as in Moldova, in Brazil and in KSA.[20] In KSA, Bani I conducted a cross sectional study among pregnant women to assess the prevalence of Hepatitis B and its associated factors. They showed that hospitalisation is a significant risk factor for hepatitis B infection**.** This result could indicate deficiencies in health care workers' knowledge and practice of the standard infection prevention and control precautions in health care settings.[21]

Blood Transfusion

A significant relation was found between blood or blood product transfusion and Hepatitis B infection; 10 (20%) of the cases received blood (or any of its products) compared to 4 (4%) of the controls. Thus, blood transfusion is a significant risk factor for Hepatitis B infection, and this might be due to improper screening of blood before transfusion.

A study conducted in Nigeria among pregnant women showed that the history of blood transfusion is a significant risk factor.[22] Also, a cross sectional study done among health care workers in Uganda showed same results.[23] This finding supports the conclusion by Al-Hindi and colleagues that the routine tests screening of blood units and its products to detect Hepatitis B infection by HBsAg test alone is not enough and there is a need to consider introducing Anti-HBc test and HBV DNA in order to discover the occult HBV, to minimise the risk of HBV transmission by blood and its products.[24]

In Brazil, it was shown that blood transfusion is among the predictors of the HBV exposure.[25] In two different studies conducted in Italy, blood transfusion and surgical intervention were among the independent risk factors.[26.27]

Surgical Procedure

Forty-two of the participants had history of surgery in the past, and among them 20 were cases and 22 are controls. This difference in proportions was found to be statistically significant, (P-value 0.02, OR=0.42). Thus, history of surgery either major or minor was significantly associated with the development of hepatitis B infection. The finding that exposure to unsafe invasive medical procedures contributes to HBV transmission is consistent with other studies, indicating deficiencies in standard infection control precautions in the local health care setting. This may be due to the fact that proper precaution was not taken during surgical procedures. However, performance of some invasive procedures through the informal sector remains a risk, and awareness campaigns directed towards the public need to be launched to raise public demand for safety.

It has been shown in several studies that dental procedures are a risk factor for HBV acquisition due to lack of sufficient knowledge in clinical infection control.[28-30] Our study revealed that dental visit is not a risk factor, whereas experimental dental visit increases the chance of HBV infection, possibly due to lack of knowledge and it was found as an independent risk factor for its transmission.

Past History of Jaundice

Past history of jaundice especially more than 6 months ago is significantly associated with acquiring of hepatitis B infection. Our study reveals that 52% of cases had past history of jaundice and 25% of control had past history of jaundice.

C. Personal Behaviour Related Risk Factors

The unsafe and unhygienic personal and community practices are risk factors of Hepatitis B transmission. Family history of Hepatitis B, contact with Hepatitis B patient, past treatment of STD and history of pre-used needle stick injury were the most important risk factors.

Treatment of STD in Past

Past treatment of STD is significantly associated with acquiring hepatitis B infection, which indicates that STD clinic population may be considered a high risk group, that these risk groups should be screened for HBV and that counselling and contact tracing seems to be of great importance. In our study, 12% of cases had past treatment of STD.

Family History and Contact with Hepatitis B Person

The risk of transmission of HBV is known to be high in people who are in contact with chronically infected subjects.[31-33] In Amazon, the high prevalence among siblings clarifies the importance of personal contact in the transmission of this virus.

In Romania[34] and Thailand,[34] the most important risk factor for HBV infection was contact with an infected person. In Greece, one of the major independent risk factor was interfamilial exposure. In Italy, being in the same household as that of a chronic HBsAg carrier was independently associated with hepatitis B.[35]

In France, among military recruits, mention of a family history of hepatitis B was a significant predictor of infection.[36] In an area of Nepal, household contact was an independent risk factor.[37] In Korea, it has been shown that HBV has strong familial clustering.[38]

Our study also strongly revealed that contact with HBV-infected person is an independent risk factor for its spread. The major spread of HBV infection in the community occurs during childhood and with familial contact. Horizontal transmission related to poor injection practices and sexual behaviour may be important factors for maintaining the spread and prevalence of HBV infection in the community.

D. Awareness about Hepatitis B

Many participants did not know about the modes of transmission of hepatitis B, and only about 52% of cases knew about it, while about 65% of controls had knowledge about it. Thus, knowledge about mode of transmission is also important in acquiring the disease in the community. Routine screening and vaccination is one of the most important preventative measures adopted to prevent and control Hepatitis B infection at the community level. Our study revealed that only 15 of the study participant reported being vaccinated against Hepatitis B; 2 of the cases and 13 of the controls.

The findings in this study, using the univariate analysis, identified that history of blood transfusion, past history of jaundice, history of surgery and history of hospitalisation, as significant health related risk factors. On the other hand, the significant personal behaviour risk factors are past treatment of STD, contact with a Hepatitis B patient, history of pre-used needle stick injury, and family history of Hepatitis B.

After use of the logistic regression of these risk factors; for control of the confounding factors, just the past history of jaundice and family history of hepatitis B remained the independent risk factor for Hepatitis B transmission.

CONCLUSION

This case-control study was an effort to highlight the main risk factors that lead to Hepatitis B Virus infection. The present study shows that the known risk factors are also significant in the transmission of Hepatitis B in Bihar. Migration which is the bane of our state was not significantly associated with hepatitis B infection. The study also suggests that episode of jaundice six month or more in the past, and household contact/family history of hepatitis B are predictors of chronic hepatitis B infection. The role of universal precaution cannot be over emphasised.

It revealed that several high risk behaviours and practices for the transmission of this infection are significantly more prevalent among the cases compared to the controls. Our data indicates that a history of blood transfusion, history of hospitalisation, history of surgery, past treatment of STD and family history of hepatitis B are important risk factors for HBV infection in our area. While the study focused in the rural population of Phulwari Sharif block, Patna, it is likely that similar results may be found elsewhere in the country. Identifying groups at risk for susceptibility can assist in the development of national strategies to target specific groups for cost-effective salvage vaccination programs for adults in the future.

The adoption of infection prevention standards as strategy is the key to Hepatitis B prevention and other blood borne pathogens, while health education for the personal hygiene will protect the public, emphasising on the vaccination of the risky behaviour groups as a first protective line.

However, this study suggests that strategy can be instituted to identify the high risk population with past history of jaundice or contact with a jaundiced person (household contact). This study can help in monitoring the population to detect clearing of HBsAg or followup for further intervention to prevent chronic HBsAg carrier state and its complications.

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