

Demographic and Behavioural Determinants of Hepatitis B Disease Transmission.

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ABSTRACT

Background: Hepatitis B is a major health problem in Kashmir with community based studies showing prevalence of around 8% Kargil district of Ladakh. **Objectives:** The aim of this study is to determine the risk factors of Hepatitis B transmission in Kargil district of Ladakh in order to help prevent and control this prevalent health problem. **Methods:** Serum markers of HBV (HBS) were tested after taking 3ml of blood with consent using Rapid One Step (SD HbsAg Biolines, Standard Diagnostic, Inc. – Hepatitis B one step test. All individuals were given a questionnaire to fulfill and 3ml of blood was taken under all aseptic precautions and subjected to HBSAg detection. All the positive sera were re-assessed in duplicate to confirm the diagnosis by ELISA. **Results:** In this study 700 healthy subjects with mean age 24.9 years, were studied for HBSAg positivity. The male to female ratio was 1.3. 55 (7.8%) were found positive for HBSAg. Prevalence of hepatitis B infection was found to be significantly associated with family history of HbsAg positivity (15.8% vs 4.68% with OR = 3.89, P = 0.001) and poor injection practice (10.9% vs 5.59% with OR = 1.92, P = < 0.05). Hepatitis B positivity was more common in age group 11-30 years, male sex, Shia muslim community, illiterate section, those who practise unprotected sex and in those with history of blood transfusion, however the difference was not statistically significant. **Conclusion:** Poor injection practice and family history of exposure to hepatitis B virus were significant risk factors for transmission of the disease in this community of high prevalence of hepatitis B. The present study emphasizes the need of public health education to reduce the prevalence of hepatitis B.

Keywords: Risk factors, hepatitis B.

INTRODUCTION

Hepatitis B is a major public health problem worldwide. The prevalence of HBsAg in general population may vary from less than 0.5% in the developed countries (United States and north European countries) to over 40% in developing countries.^[1] According to WHO report on prevention of HBV in India, HBsAg prevalence among general population ranges from 0.1% to 11.7%, being between 2% to 8% in most studies, placing India in intermediate HBV endemicity zone. High rates of these infections in many South Asian countries are attributable to poverty, unhygienic living condition, illiteracy, unsafe blood supply, poor medical facilities and reuse of contaminated syringes, unsafe sexual practice, and frequent use of intravenous drugs. Although HB infection is preventable through safe

and effective vaccination and health education, it is associated with high morbidity and mortality and constitutes a high economic burden.^[2] There are only a few community based studies that have looked into the prevalence and modes of transmission of hepatitis B infection in our community. It is important to identify the demographic and behavioral determinants of the disease transmission to highlight the risk factors responsible for its spread and to increase awareness among people. This helps identifying the target population in order to take appropriate measures to prevent and control the hepatitis B infection. We have previously reported high prevalence of 7.8% of seropositivity of hepatitis B in Kargil district of Ladakh,^[3] hence the present study was undertaken to determine the risk factors of transmission of hepatitis B in this community.

Objective

Kargil, a remote area in J&K state of India. No study of such a kind so far has been conducted in this region. It was deemed relevant and necessary to conduct this study to understand the demographic and behavioural determinants of hepatitis B disease transmission in this remote area. The purpose of the

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study was to analyze various risk factors for transmission of Hepatitis B in this community.

MATERIALS AND METHODS

The study was performed on a healthy population of Kargil district of Ladakh region. People with a history of hepatitis B vaccine were excluded. A total of 700 subjects were taken for study. All individuals were given a questionnaire to fulfill and 3ml of blood was taken under all aseptic precautions and subjected to HBsAg detection. Detailed information which included age, sex, address, Marital Status Pregnancy Status, Educational Qualification, Community (Shia Muslim / Suni Muslim / Non-Muslim), Occupatio, History of known risk factors (if any) Clinical Features of Hepatitis were noted. Serum markers of HBV (HBS) was tested after taking 3ml of blood with consent using Rapid One Step (SD HbsAg Biolines, Standard Diagnostic, Inc. – Hepatitis B one step test with a relative sensitive and specificity of 100% and 100% respectively. All the positive Sera was re-assessed in duplicate to confirm the diagnosis by ELISA.

RESULTS

In this study 700 healthy subjects aged 11-60 years were studied for HBsAg positivity. Male to female ratio was 1.3. The mean age was 24.9 years Also, prevalence of HBsAg was 9% in males, 6.33% in females, 8.71% in age group of 11-30 years, 7.36% in the age group of 31-60 years (OR =2.74, P = 0.19). Risk factors related to transmission of Hepatitis B were analyzed. Out of 700 subjects studied 202 (28.86%) had family contact which included 98 (24.5%) males and 104 (34.67%) females. 220 subjects had high risk sexual behavior (premarital/extramartial) which comprised of 120 (32.25%) males and 99 (33%) females. 266 (38%) had unsafe injection practice (non disposable syringes) which comprised of 142 (35.5%) males and 124 (41.33%) females. 49 (7%) had history of blood transfusion which comprised of 14 (3.5%) males and 35 (11.67%) females with a male to female ratio of 0.4. [Table 1 and Figure 1]. Likelihood of HBsAg positivity among subjects with family contact was 3.89 times more likely, compared to subjects without family contact, with significant with p-value <0.05 as shown in [Table 2 and Figure 2]. Likelihood of HBsAg positivity among subjects with poor injection practice was 1.92 times more than subjects with safe injection practice with significant with a p-value =0.019 as shown in [Table 3 and Figure 3]. Likelihood of HBsAg positivity among subjects with unprotected sex was 1.42 times more than subjects with safe sex, however the difference was not statistically significant as shown in [Table 4]. Likelihood of HBsAg positivity among

subjects who received blood transfusions was 1.28 times more than subjects who did not receive blood transfusion, however the difference was not statistically significant as shown in [Table 5]. Out of 700 studied subjects 362 were unmarried, 338 married and 470 were illiterate whereas 230 were literate. Majority of the participants in the study were labourers by profession (335). Prevalence of HBsAg was 9.1% in married, 6.63% in unmarried (OR = 1.42, P = 0.21). HBsAg positivity was 8.2% in Shia community, 5.56% in non-Muslims, 4.7% in Sunni Muslims (OR = 1.65, P = 0.024), 8.72% in illiterate, 6.09% in literate (OR = 1.47, P = 0.22), 9.25% in labourers, 7.41% in skilled workers, 6.17% in household workers P = 0.36). Among pregnant females HBsAg prevalence was 14.29% compared to 7.3% in rest of the females (OR = 2.74, P = 0.121).

Table 1: Modes of Transmission for HBsAg in the Studied Population

Characteristic	Male		Female		Total		p value
	n	%	n	%	n	%	
Family Contact	98	24.50	104	34.67	202	28.86	0.003
Unprotected Sex	129	32.25	99	33.00	228	32.57	0.834
Poor Injection Practice	142	35.50	124	41.33	266	38.00	0.116
Blood Transfusion	14	3.50	35	11.67	49	7.00	0.000

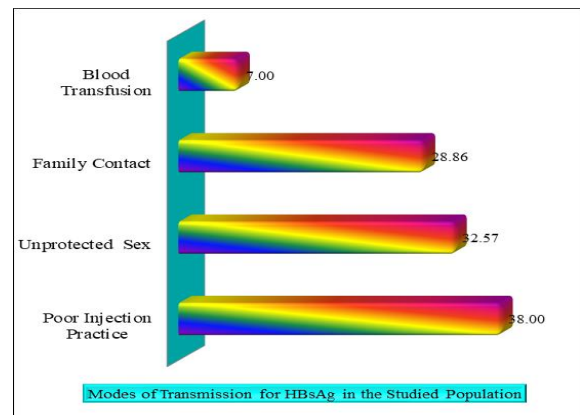


Figure 1: Modes of transmission

Table 2: HBsAg in relation with Family Contact of the Studied Population

	Total Subjects	HBsAg Positive		HBsAg Negative		p value
		n	%	n	%	
History of Family Contact	202	32	15.84	170	84.16	0.000
No History of Family Contact	498	23	4.62	475	95.38	
Total	700	55	7.86	645	92.14	

Odds Ratio = 3.89

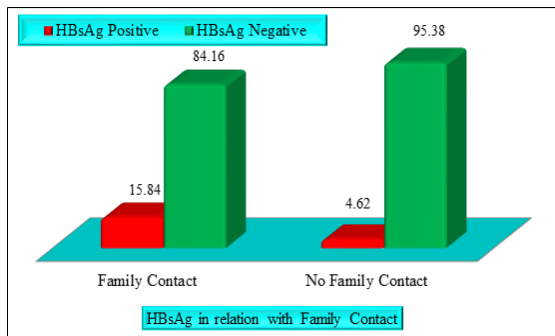


Figure 2: HBsAg in relation with history of Family Contact.

Table 3: HBsAg in relation with Injection Practice of the Studied Population.

	Total Subjects	HBsAg Positive		HBsAg Negative		p value
		n	%	n	%	
Unsafe Injection Practice	266	29	10.90	237	89.10	0.019
Safe Injection Practice	434	26	5.99	408	94.01	
Total	700	55	7.86	645	92.14	

Odds Ratio = 1.92

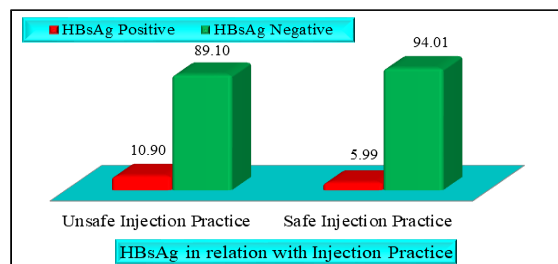


Figure 3: HBsAg in relation with Injection Practice of the Studied Population.

Table 4: HBsAg in relation with Sexual Practice of the Studied Population.

	Total Subjects	HBsAg Positive		HBsAg Negative		p value
		n	%	n	%	
Unprotected Sex	228	22	9.65	206	90.35	0.221
Safe Sex	482	33	6.99	439	93.01	
Total	700	55	7.86	645	92.14	

Odds Ratio = 1.42

DISCUSSION

The routes of transmission of hepatitis B include vertical (mother to child), early life horizontal (bites, cuts, lesions), late life horizontal (sexual and IV drug use). The primary method of transmission reflects the prevalence of hepatitis B infection in a given area. In low prevalence areas such as USA, Western

Europe injection, drug abuse and unprotected sex are the primary methods. In moderate prevalence areas such as Japan, Russia, Eastern Europe where 2-7% of population is infected, the disease spread is in childhood with cuts, bites, improper injection techniques being the main source. Kargil district of Ladakh (J&K State) was reported having high prevalence of hepatitis B infection by local physicians and medical practitioners and our group described a prevalence of 7.8% to confirm the observation of local physicians. This study was intended to study the risk factors and modes of transmission of hepatitis B in this high prevalent zone so as to prevent and control the disease burden. We found higher prevalence of HBsAg positivity (15.84%) among subjects who had positive family history of hepatitis B in the family as compared to those with negative family history (4.62%). This difference was statistically significant ($p < 0.05$).

Table 5: HBsAg in relation with Blood Transfusion of the Studied Population

	Total Subjects	HBsAg Positive		HBsAg Negative		p value
		n	%	n	%	
History of Blood Transfusion	49	5	9.61	44	90.39	0.617 (NS)
No History of Blood Transfusion	651	50	7.72	601	92.28	
Total	700	55	7.86	645	92.14	

Odds Ratio = 1.28

These observations were consistent with other studies(4,5,6) In our study we found a higher prevalence of HBsAg positivity (10.9%) in persons with poor injection practice as compared to persons practising safe injection practice of 5.99%. In Kargil (Ladakh) due to poor road connectivity, inadequate access to health care facility and medical supplies there is a tendency to use and reuse non-disposable glass syringes. Such syringes are reused on multiple subjects many times without proper sterilization. Our observation was consistent with the studies.^[4,7,8] Age groups 21-40 years had HBsAg positivity of 11.1% higher rest of the age groups (5.6%). It may be due to the rising incidence of risk factors for the HBV infection at end of adolescence. This data is also consistent with the child bearing age of the females, permitted age range of blood donation, employment, the three most common sources of HBV cases' detection. However there was no statistical significance among different age groups. HBsAg prevalence in our study was higher in men (9.0%) than in women (6.33%). Studies conducted in Egypt, Turkey and Brazil showed that the male gender was considered a risk factor for HB infection However the difference was not statistically significant. In our study HBsAg positivity was more in Shia

Muslims (8.2%) as compared to Sunni Muslims (4.76%) or non-Muslims (5.56%).^[9-11] Although the difference was statistically insignificant, the higher prevalence of HBsAg among Shia Muslims could be due to practice of “Self Flagellation” by Shia Muslims which inflicts repeatedly inflict injuries with blood contaminated chains on the body especially back of the trunk. Our study also found high percentage of HBsAg positivity in illiterate, labourers, married, subjects with unprotected sex, blood transfusion recipients. However the difference was not statistically significant ($p>0.05$).

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CONCLUSION

Poor injection practice and family contact were significantly associated high risk of developing hepatitis B. Public education and awareness about the determinants of HBV and its mode of transmission is necessary to control and prevent the burden of disease.

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