

Behavioral Risk Factors of HBV Infection and its Association with HBs Ag Positivity among Residents of Kaza Sub- division of District Lahaul & Spiti in Himachal Pradesh

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Abstract

Background: Chronic viral hepatitis is a major global public health problem, an important cause of morbidity and mortality. We conducted this study to evaluate the behavioral risk factors of HBV infection and its association with HBsAg positivity among residents of Kaza sub-division of district Lahaul & Spiti in Himachal Pradesh.

Material & Methods: The study was carried out by the Gastroenterology, Community Medicine, and Microbiology Department at Indira Gandhi Medical College Shimla at Kaza, a subdivision of Lahaul & Spiti. The cluster sampling technique was used to get the desired sample size of 4000. Forty clusters were chosen using a probability proportionate to size sampling method, and 100 research participants were added to each cluster using a simple random sampling method. The data was gathered using a pre-tested interview plan. A blood sample of 5 mL from each study participant was obtained, and its HBsAg content was examined.

Results: In our study, 2.7% of the interviewed respondents' parents were positive for hepatitis B and 3.7% reported one positive family member. Injectable drug use was reported by 1.6 (68/4231). Among these users 8.8% (6/68) shared needles with other IDUs in last 12 months and 35.3% (24/68) used a common container to draw up drug solution. Sexual intercourse was reported to be experienced by 15.5 (655/4231) and 12.2% either did not disclose or were children. Out of those who ever experienced sexual/penetrative intercourse 38.3% (251/655) had reported it with someone else other than a spouse. Majority of these had two partners other than a spouse (30.3%; 76/251). Around 30% (195/655) reported of using a condom in their last intercourse. Body piercings or a tattoo from someone who doesn't sterilize his or her equipment, including local treatment from lamas, was prevalent among 16.3% of the population (689/4231). Acupuncture was taken as a remedy for any medical condition by 9% of participants. Regression analysis also revealed that one infected family member emerged as an independent factor associated with HBsAg positive test after adjusting for confounders.

Conclusion: Our study provided much important information concerning hepatitis B risk factors in this tribal group. Health education about behavioral risk factors among this tribal population should be the main intervention that might help limit the spread of these blood-borne infections.

Keywords: Hepatitis B Surface Antigens, Body Piercing, Hepatitis B virus, Condoms, Spouses, Sample Size, Tattooing, Gastroenterology, Hepatitis B, Morbidity, Parents, Acupuncture Therapy, Surveys and Questionnaires.

INTRODUCTION

A significant global public health issue, chronic viral hepatitis substantially contributes to morbidity and mortality from its

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Access this article online

Quick Response Code



Website:

www.iapsmupuk.org

DOI:

10.47203/IJCH.2023.v35i01.010

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How to cite this article: Gupta A, Sachdeva A, Sharma R, Sharma N, Barall D, Bodh V, Sharma D, Brij Sharma B. Behavioral Risk Factors of HBV Infection and its Association with HBs Ag Positivity among Residents of Kaza Sub- division of District Lahaul & Spiti in Himachal Pradesh. Indian J. of Com. Health. 2023;35(1):52-59.

Received: 08-10-2022, **Accepted:** 02-03-2023, **Published:** 31-03-2023

sequelae, including chronic hepatitis, cirrhosis, and primary liver cancer. Because chronic hepatitis is a “silent” illness, its impact on worldwide morbidity and mortality is typically overestimated.^[1]

Parenteral exposure to bodily fluids that are infected usually results in the development of hepatitis B and C. Receiving infected blood or blood products, invasive medical operations utilizing contaminated equipment, and for hepatitis B transmission from mother to baby at birth, from family member to child, as well as through sexual contact, are common routes of transmission for these viruses.^[2,3]

The goal of hepatitis B and C prevention and control should be to lower the risk of developing the chronic liver disease as well as the prevalence of new infections. A thorough public health prevention programme should cover the following topics: preventing and detecting HBV and HCV infections; diagnosing and treating chronic liver disease linked to viral hepatitis; conducting surveillance and monitoring the efficacy of prevention activities; and establishing a research agenda.^[1,2]

Kaza health block in Lahaul and Spiti District has a population of 12,547 and the health institutions in the block include one CHC, five PHCs and 10 health sub-centers. In the past three years, more than 200 cases of Viral hepatitis B have been reported to the department of gastroenterology at Indira Gandhi Medical College and Hospital, indicating a high prevalence of viral hepatitis B.^[4] The reasons behind such a high prevalence need to be investigated taking into consideration the serious health consequences of the infection. As viral hepatitis C transmission is similar to the transmission of viral hepatitis B, we conducted this study to evaluate the behavioral risk factors of HBV infection and its association with HBsAg positivity among residents of Kaza sub-division of district Lahaul and Spiti in Himachal Pradesh.

AIMS & OBJECTIVES

To evaluate the behavioral risk factors of HBV infection and its association with HBsAg positivity among residents of Kaza sub-division of district Lahaul and Spiti in Himachal Pradesh.

MATERIAL AND METHODS

The Gastroenterology, Community Medicine and Microbiology department, Indira Gandhi Medical College Shimla conducted the study. The survey was undertaken at Kaza, a sub-division of the district, Lahaul and Spiti.

Study Design: The study was to identify risk factors for higher transmission among those infected as compared to the controls (uninfected)

Study duration: June 2015 through October 2017.

Study population: The study population with comprise all residents of Kaza sub-division of district Lahaul and Spiti of Himachal Pradesh. Kaza Sub Division of Lahaul and Spiti has a population of 12,547, including 6,691 males and

5,766 females (Census 2011). There is one community health centre, 5 primary health centers, 9 sub-centers and 11 Village panchayats.

Sample size: The study was a part of a survey done to the prevalence of hepatitis B virus (HBV) in the tribal area of Himachal Pradesh in which the sample size was calculated with a reported prevalence of 16.0 at 5% level of significance with 80.0% study power, 2.0% level of precision and design effect of 3. It came out to be 3864 (Appox. 4000).

Exclusion Criteria

Those who do not consent to participate in the study.

Sampling Methodology

The desired sample size was obtained by cluster sampling technique. All the Spiti area villages and their population were listed in ascending order. By probability proportionate to size sampling 40 clusters (One cluster with one or more villages) were selected. In each cluster 100 study subjects were enrolled for the study by simple random sampling.

Data Collection

A pre-tested interview schedule was used for data collection. The data elements included a complete history of illness (if any), risk behaviors leading to high transmission of HBV/HCV. This interview schedule was filled by trained health workers and field investigators appointed from the Spiti area's local inhabitants.

From each study subject 5 mL of blood sample was taken by a trained laboratory technician. Collected blood samples were transported in cold chain equipment at suitable temperatures to the microbiology, Hematology and Biochemistry laboratories of IGMC Shimla for analysis. The blood samples were analyzed for HBsAg.

Data Analysis

Data was analyzed using EpiInfo software version 7.1.2 for windows. Descriptive analysis was conducted to describe the study participants' population characteristics at baseline, risk behaviors, immunization status and clinical profile (only sick or found to be HBV/HCV positive).

Bivariate analysis was done to identify for factors likely to be significantly associated with HBsAg. Logistic regression analysis was conducted to control for confounding to identify independent risk factors. A *p-value* of 0.05 or below was considered as statistically significant.

Quality Assurance

The proposal was peer-reviewed by subject matter experts before implementation in the field. The sampling procedure adopted was robust, with a cluster size of at least 40 and a simple random clustering procedure within each cluster. The serum/blood sample was analyzed in the laboratories of the tertiary care hospital of the state (IG Medical College, Shimla) under strict quality control of the heads of the respective laboratories.

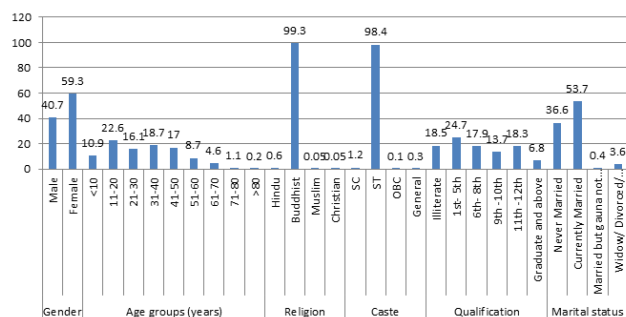


Figure 1: Socio-demographic profile of study population

Ethical Issues

The survey was started after taking ethical permission from the Institutional Ethical Committee, IGMC Shimla (HFW(MS)G-5(Ethics)/2014-5257). Informed written consent was obtained from the head of the selected family to voluntarily participate in the study. The information obtained was kept strictly confidential and used only for research purposes and dissemination to the department of Health and Family Welfare for the recommended interventions without disclosing the identity of the individuals. Those found to be infected were given appropriate care according to the existing standards by department of gastroenterology. As per the existing norms of the IGMC and Hospital, Shimla. Blood samples collected were destroyed after testing as per the hospital waste management protocols.

RESULTS

The study was undertaken at Kaza, a sub-division of the district, Lahaul and Spiti by the department of Gastroenterology, Community Medicine and Microbiology, Indira Gandhi Medical College Shimla.

The study population surveyed was 4238, of which information regarding seven were missing and hence were excluded from final analysis. The final analysis was conducted on 4231.

The study population comprised of 59.3% of females. The majority of the study population was in the age group 21 to 50 years; the age group 11 to 20 years comprising 22.6%, 31 to 40 years comprising 18.7% and 41 to 50 years age group comprising 17.0%. Buddhism was the most followed religion in the area 99.3 and 98.4% of the population were scheduled tribe. Around one-fourth of the population had attained school between 1st and 5th standard (24.7%). Only 6.8% were graduate and above. Agriculture was the major occupation of the area with 20.4% study population involved in it. There were 31.7% students, 16.8% homemakers and 14% service class.

More than half of the population (53.7%) was currently married, 5.4% were monks/nuns and 36.6% were never married. Currently 68.9% of the population was living with family without their sexual partner and 19 and 10.2% were living with spouse and friends, respectively (Figure 1).

In our study, 2.7% of the interviewed respondents' parents were positive for hepatitis B and 3.7% reported one positive family member.

Table 1(a): Risk factors of hepatitis B among study population- occupational behaviour

	Number	Percent
Total	4231	100.0
Any of the parents of respondents positive for Hepatitis B		
Don't know	469	11.1
Yes	113	2.7
No	3649	86.2
Inject able drug use		
Ever use inject able drugs? (not prescribed by physician/doctor)		
Yes	68	1.6
No	3947	93.3
Not applicable	216	5.1
Share needle/syringe with other injecting drug user in the last 12 months		
Yes	6	8.8
No	62	91.2
Total	68	100
When you injected last time, did you draw up drug solution from a common container?		
Yes	24	35.3
No	44	64.7
Total	68	100
Body piercings or tattoos from someone who doesn't sterilize his or her equipment including local treatment from lamas		
Don't remember	213	5.0
Yes	689	16.3
No	3329	78.7
Total	4231	100.0
Ever had the need for Blood Transfusion		
Don't remember	84	2.0
Yes	97	2.3
No	4050	95.7
Total	4231	100.0
Ever take surgical treatment for Dental Problems		
Don't remember	32	.8
Yes	2226	52.6
No	1973	46.6
Total	4231	100.0
Ever undergone any Surgical Procedure		
Don't remember	36	.9
Yes	513	12.1
No	3682	87.0
Total	4231	100.0
Ever suffered from jaundice		
Do not remember	42	1.0
Yes	485	11.5

No	3704	87.5
Total	4231	100.0
Health care setting exposure		
Do you or your spouse work in some health care settings		
Not applicable	121	2.9
Yes	44	1.0
No	4066	96.1
Total	4231	100.0
If yes, were you exposed to any needle stick injury during your job		
Yes	13	29.5
No	31	70.5
Total	44	100.0
Did you ever get acupuncture done for any medical condition		
Do not remember	153	3.6
Yes	379	9.0
No	3699	87.4
Total	4231	100.0

Table 1(b): Risk factors of hepatitis B among study population- sexual behavior

<i>Sexual behavior</i>		
Ever experienced sexual intercourse		
Not applicable/ Did not disclose	516	12.2
Yes	655	15.5
No	3060	72.3
Total	4231	100.0
Sexual intercourse with anyone else other than a spouse		
Did not comment	21	3.2
Yes	251	38.3
No	383	58.5
Total	655	100
Number of sexual partners other than spouse		
Did not tell	155	61.8
1	13	5.2
2	76	30.3
3	6	2.4
4	1	0.4
Total	251	100
In your last sexual intercourse with him/her, did you use a condom		
Yes	195	29.8
No	400	61.1
Not sure/do not remember	60	9.2
Total	655	100.0

Have any of your sexual partners had a sexually transmitted disease in the past year		
Don't know	47	7.2
Yes	13	2.0
No	595	90.8
Total	655	100.0
Any of the sexual partners had other partners while still in a relationship with the participant		
Don't know	46	7.0
Yes	16	2.4
No	593	90.5
Total	655	100.0
Any of the sexual partners had injected drugs		
Don't know	24	3.7
Yes	8	1.2
No	623	95.1
Total	655	100.0

For Males

Total	1721	100.0
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STD		
In the past did you have any abnormal discharge from the penis?		
Do not remember	160	9.3
Yes	86	5.0
No	1475	85.7
In the past did you have any genital sore/ulcer?		
Do not remember	157	9.1
Yes	30	1.7
No	1534	89.1
In the past, did you have any pain while passing urine?		
Do not remember	164	9.5
Yes	163	9.5
No	1394	81.0

For Females

Total	2510	100.0
In the past, did you have foul smelling discharge from vagina?		
Do not remember	163	6.5
Yes	529	21.1
No	1818	72.4
In the past, did you have any pain while passing urine?		
Do not remember	164	6.5
Yes	381	15.2

Table 2a: Behavioral risk factors among those with and without infection-Uni-variate analysis

<i>Uni-variate Analysis</i>				<i>Ever had a blood transfusion</i>				
	<i>HBsAg Positive</i>	<i>HBsAg Negative</i>	<i>Total</i>	<i>p-value</i>	<i>HBsAg Positive</i>	<i>HBsAg Negative</i>	<i>Total</i>	<i>p-value</i>
Total	962	1924	2886		15	24	39	
	33.30%	66.70%	100.00%		38.50%	61.50%	100.00%	
Number of family members positive for HBsAg					Don't know			
					23	46	69	0.79
					33.30%	66.70%	100.00%	
0	841	1813	2654		924	1854	2778	
	31.70%	68.30%	100.00%		33.30%	66.70%	100.00%	
1	68	45	113		Ever took dental surgery			
	60.20%	39.80%	100.00%		5	10	15	
2	36	51	87		33.30%	66.70%	100.00%	
	41.40%	58.60%	100.00%	<0.001	Did not reply			
3	7	9	16		529	1048	1577	0.97
	43.80%	56.30%	100.00%		33.50%	66.50%	100.00%	
4	2	1	3		Yes			
	66.70%	33.30%	100.00%		428	866	1294	
					33.10%	66.90%	100.00%	
Any of the parents positive for Hep B					Ever undergone surgical procedures			
					8	8	16	0.26
Don't know	97	193	290		50.00%	50.00%	100.00%	
	33.40%	66.60%	100.00%		120	263	383	
Yes	39	37	76	0.003	31.30%	68.70%	100.00%	
	51.30%	48.70%	100.00%		No			
No	826	1694	2520		834	1653	2487	
	32.80%	67.20%	100.00%		33.50%	66.50%	100.00%	
Ever used Injectable drug					Ever suffer from jaundice			
					10	12	22	
NA	32	83	115		45.50%	54.50%	100.00%	
	27.80%	72.20%	100.00%		110	195	305	0.26
Yes	23	32	55	0.19	36.10%	63.90%	100.00%	
	41.80%	58.20%	100.00%		No			
No	907	1809	2716		842	1717	2559	
	33.40%	66.60%	100.00%		32.90%	67.10%	100.00%	
Share needles					You or your spouse ever worked in health care setting			
					17	46	63	
Yes	2	0	2		27.00%	73.00%	100.00%	
	100%	0.00%	100.00%		8	30	38	0.15
No	18	29	47		21.10%	78.90%	100.00%	
	38.30%	61.70%	100.00%	0.2	No			
Do not remember	3	3	6		937	1848	2785	
	50%	50%	100%		33.60%	66.40%	100.00%	
Total	23	32	55		If yes, Ever exposed to needle stick injuries			
	41.80%	58.20%	100.00%		Did not remember			
Drew drug from common container					0	2	2	
					0	100%	100.00%	
Yes	2	0	2		Yes			
	100.00%	0.00%	100.00%		2	4	6	
No	18	29	47		33.30%	66.70%	100.00%	
	38.30%	61.70%	100.00%	0.2	No			
Don't know	3	3	6		6	24	30	
	50%	50%	100%		20.00%	80.00%	100.00%	
Total	23	32	55		Ever received acupuncture			
	41.80%	58.20%	100.00%		Don't remember			
Body piercing and tattoo from someone who doesn't sterilize his or her equipment, including local treatment from lamas					24	54	78	
					30.80%	69.20%	100.00%	
Do not remember	41	67	108		Yes			
	38.00%	62.00%	100.00%	0.06	101	206	307	0.87
Yes	151	367	518		32.90%	67.10%	100.00%	
	29.20%	70.80%	100.00%		No			
No	770	1490	2260		837	1664	2501	
	34.10%	65.90%	100.00%		33.50%	66.50%	100.00%	

Table 2b: Behavioral risk factors among those with and without infection-Uni-variate analysis

Uni-variate Analysis		HBsAg Positive	HBsAg Negative	Total	p value	HBsAg Positive	HBsAg Negative	Total	p-value
					<i>Sexual partner injected drugs</i>				
	HBsAg Positive	HBsAg Negative	Total	p value	Don't know				
	962	1924	2886		4	12	16		
	33.30%	66.70%	100.00%		25.00%	75.00%	100.00%		
					Yes				0.16
					3	2	5		
					60.00%	40.00%	100.00%		
Ever had penetrative sex					No				
					730	1512	2242		
					32.60%	67.40%	100.00%		
Not applicable	89	198	287		<i>Used condom in last intercourse with spouse</i>				
	31.00%	69.00%	100.00%		Don't remember				
Yes	145	294	439		7	14	21		
	33.00%	67.00%	100.00%	0.65	33.30%	66.70%	100.00%		
					Yes				0.85
					12	29	41		
					29.30%	70.70%	100.00%		
No	728	1432	2160		No				
	33.70%	66.30%	100.00%		750	1491	2241		
					33.50%	66.50%	100.00%		
<i>Sexual intercourse with other than spouse</i>					<i>Males (Abnormal discharge from penis in last 12 months)</i>				
Can't say	3	5	8		Do not remember				
	37.50%	62.50%	100.00%		29	55	84		
Yes	79	134	213		34.50%	65.50%	100.00%		
	37.10%	62.90%	100.00%	0.19	Yes				0.93
					25	47	72		
No	63	155	218		34.70%	65.30%	100.00%		
	28.90%	71.10%	100.00%		No				
					363	732	1095		
Total	145	294	439		33.20%	66.80%	100.00%		
	33.00%	67.00%	100.00%		<i>History of genital sore</i>				
<i>How many people you had sex with other than spouse</i>					Don't remember				
0	66	160	226		28	54	82		
	29.20%	70.80%	100.00%		34.10%	65.90%	100.00%		
1	51	90	141		Yes				0.61
	36.20%	63.80%	100.00%		11	15	26		
					42.30%	57.70%	100.00%		
2	19	26	45		No				
	42.20%	57.80%	100.00%	0.41	378	765	1143		
					33.10%	66.90%	100.00%		
3	7	15	22		<i>Pain in passing urine</i>				
	31.80%	68.20%	100.00%		Do not remember				
					29	56	85		
4	2	3	5		34.10%	65.90%	100.00%		
	40.00%	60.00%	100.00%		Yes				0.49
					51	84	135		
					37.80%	62.20%	100.00%		
<i>Did you use condom in last intercourse</i>					No				
Don't remember	12	33	45		337	694	1031		
	26.70%	33.30%	100.00%		32.70%	67.30%	100.00%		
Yes	26	47	73		<i>Females (Foul smelling discharge from vagina)</i>				
	35.60%	64.40%	100.00%	0.59	Do not remember				
No	107	214	321		31	54	85		
	33.30%	66.70%	100.00%		36.50%	63.50%	100.00%		
<i>Partner had STD</i>					Yes				0.82
Don't know	10	23	33		124	248	372		
	30.30%	69.70%	100.00%		33.30%	66.70%	100.00%		
Yes	3	2	5		No				
	60.00%	40.00%	100.00%	0.42	390	788	1178		
No	132	269	401		33.10%	66.90%	100.00%		
	32.90%	67.10%	100.00%		<i>Pain while passing urine</i>				
<i>Sexual partner having another partner</i>					Do not remember				
Don't know	11	20	31		31	56	87		
	35.50%	64.50%	100.00%		35.60%	64.40%	100.00%		
Yes	6	7	13		Yes				0.62
	46.20%	53.80%	100.00%	0.57	83	185	268		
					31.00%	69.00%	100.00%		
No	128	267	395		No				
	32.40%	67.60%	100.00%		431	849	1280		
					33.70%	66.30%	100.00%		

Table 3: Binary logistic regression analysis to identify risk factors for Hepatitis B infection

	Sig.	Adj OR	95% C.I. for AdjOR	
			Lower	Upper
Family members positive				
Zero	0.00	1.00		
One	<0.001	3.615	2.371	5.511
Two	0.07	1.557	.962	2.521
Three	0.19	2.065	.700	6.089
Four	0.34	3.311	.289	37.870
Any of your parents were positive				
No	0.33	1.00		
Don't know	0.62	1.074	.809	1.425
Yes	0.15	1.481	.862	2.544
Body piercing/ tattoos from someone who doesn't sterilize his or her equipment including local treatment from lamas				
No	0.22	1.00		
Do not remember	0.72	1.084	.699	1.682
Yes	0.10	.833	.670	1.035

Injectable drug use (not prescribed by a doctor/physician) was reported by 1.6% (68/4231) of the study population. Among these users 8.8% (6/68) shared needles with other IDUs in last 12 months and 35.3% (24/68) used a common container to draw up drug solutions.

Sexual intercourse was reported to be experienced by 15.5% (655/4231) of study population and 12.2% either did not disclose or were children. Out of those who ever experienced sexual/penetrative intercourse 38.3% (251/655) had reported it with someone else other than a spouse. The majority of these had two partners other than spouse (30.3%; 76/251). However, 61.8% (155/251) did not disclose the number. Around 30% (195/655) reported of using a condom in their last intercourse.

Body piercings or a tattoo from someone who doesn't sterilize his or her equipment, including local treatment from lamas was prevalent among 16.3% of the population (689/4231). Jaundice was reported to be suffered by 11.5% (485/4231) of the population. The 1% (44/4231) of the study population either worked themselves in a health care setting or their partner used to work and out of these 29.5% (13/44) were exposed. Acupuncture was taken as a remedy for any medical condition by 9% of the population.

Symptoms of sexually transmitted infections in the form of discharge from the penis, genital sore and pain while passing urine was reported by 5, 1.7 and 9.5% of males, respectively. Among females 21.1% reported of foul-smelling discharge from the vagina and 15.2% with pain while passing urine. (Table 1 a,b)

Status of Hepatitis B positives among any of the population's parents was known to 2.6% (76/2886) and 51.3% tested positive (OR: 2.16; 95% CI: 1.37-3.42; p: 0.003). Intravenous drug abuse and unsafe injection i.e. without

prescription of a physician, was used by 1.9% (55/2886) and out of this 41.8% were tested positive as compared to 33.4% among those who never used Injectables (p: 0.19). Among the IDUs only 3.6% (2/55) gave a history of sharing needles and drawing drug from common containers. History of body piercing and tattoo from someone who doesn't sterilize his or her equipment, including local treatment from lamas was given by 17.9% (518/2886) of the population. Of these, 29.2% tested positive for hepatitis B (p:0.06).

That reporting of blood transfusion, dental surgery, or any kind of surgery in the past were not significantly associated with hepatitis B positive. Around 11% (307/2886) reported receiving acupuncture for any medical condition and of these 32.9% were tested positive as compared to 33.5% positives among those who did not receive acupuncture (p: 0.87) (Table 2a,b).

History of multiple sexual partners (intercourse with other than spouse) was reported by 48.5(218/439) and 37.1% (79/213) of these were tested to be positive as compared to 28.9% of those who did not report of multiple partners (p: 0.19). Use of condom in last intercourse was reported by 16.6(73/439) and of these 64.4% (47/73) were tested to be negative as compared to 66.7% (214/321) who did not report using a condom (p: 0.59). The positive test among those males who reported symptoms of sexually transmitted diseases in last 12 months like abnormal discharge from the penis, genital sore and pain during passing urine was 34.5, 42.3 and 37.8%, respectively but this distribution was statistically non-significant. Similarly, the positive test among those females who reported symptoms of sexually transmitted diseases in last 12 months like foul-smelling discharge from vagina and pain while passing urine was 33.3 and 31%, respectively but this distribution was statistically non-significant (Table 2 a,b).

Those independent variables which on uni-variate analysis yielded $p < 0.10$ on applying a test of significance, were subjected to binary logistic regression modeling with HBsAg positive as the dependent variable. The independent variables subjected to model were any parent positive for an infection and the number of family members positive for infection. There was around four times higher risk of getting infected if one of the family members are positive as compared to none (or:3.62; 95% CI: 2.37-5.51; $p < 0.001$) (Table 3).

DISCUSSION

The study was conducted at Kaza, a sub-division of the district, Lahaul and Spiti by the departments of Gastroenterology, Community Medicine and Microbiology, Indira Gandhi Medical College Shimla. The study was planned to owe to the increasing number of lab-reported cases of HBV hailing from this district from a tertiary care hospital of the state. Various cultural and behavioral factors were hypothesized to be associated with the infection among the population.

Unsafe injection practice, intravenous drug abuse and sharing needles did not emerge as significant factor associated with positivity in the current study. The prevalence of HBsAg positivity was seen in 2.7–10.8% across different studies of India.^[5-7] In our study this prevalence was 2.4%.

The Tibetan tribes of the country have a cultural practice of body piercing and tattoo from someone who doesn't sterilize his or her equipment, including local treatment from lamas. This was reported overall among 16.3% of the population; however, it was not significantly associated with HBV positivity. Also, this area observed the practice of using common razors in shaving. Since every family sends one of its child to become lama and shaving the child's head is mandatory, use of common razors is the practice in the region.

A history of multiple sexual partners was reported among 38.3% of the population. Sexual transmission can result in acute hepatitis B. But the current analysis showed no association between sexual intercourse and HBsAg positivity. Although quantities in these fluids are smaller than in blood, HBsAg has been discovered in seminal fluid and vaginal secretions. The likelihood that HBV will be transferred through sexual contact depends on the type of exposure, the source's viral load, and the presence of other STDs.^[8,9]

After subjecting the variables to the logistic regression, one infected family member emerged as an independent factor associated with HBsAg positive test after adjusting for confounders. Hence, health education regarding mode of transmission and prevention is important for healthcare workers of high risk groups and the general public. Public awareness is the most cost-effective measure in preventing the transmission of infection.^[10]

The parental transmission was a significant risk factor in the bivariate analysis of our study with more than half of the positives among those whose any one parent was positive for HBV. However, one of the family members being affected from HBsAg was one of the independent risk factors in our study. Here both horizontal and vertical transmissions are contributing factors. Persons with chronic HBV infection are the major reservoir for transmission, although any person testing positive for HBsAg is potentially infectious to both household and sexual contacts.^[11]

A study by Ramya Dinesh E *et al.*^[12] showed that jaundice in family (JF), tattooing, series of injections, sexual promiscuity, and surgery with blood transfusion plays a major role in the transmission in the spread of HBV. Similarly, high-risk sexual behavior, having an HBV-positive person in the family, being a student and being a preacher were the most prominent risk factors associated with HBsAg positivity in the study done by Sharma RK *et al.*^[13] History of surgical operation, exposure to traditional operational practices and scarification and having a person in the family with viral hepatitis were significantly associated with HBV infection in the study done by Makuza J.D *et al.*^[14]

CONCLUSION

The findings of our study shed significant light on the hepatitis B risk factors prevalent in this indigenous group. The primary interventions that could assist in preventing the spread of these blood-borne illnesses among this indigenous group should focus on health education regarding behavioral risk factors.

Therefore, particular initiatives like forums, seminars, and ongoing education about HepB prevention strategies should be made for these groups.

ACKNOWLEDGMENT

National Health Mission, Himachal Pradesh and Directorate of Health Services, Himachal Pradesh.

FINANCIAL SUPPORT AND SPONSORSHIP

National Health Mission, Himachal Pradesh.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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