

Seroprevalence of Hepatitis B among Tibetan refugees in Dehradun and its associated risk factors

Aggarwal B, Gupta S

ABSTRACT

Background: Tibetans has been living in India since decades and inflow of immigrants is continuing. Earlier, various studies have shown a very high seroprevalence of hepatitis B among them. There is no conclusive data on current status of hepatitis B seroprevalence among them especially in northern India.

Aim: To study the seroprevalence of hepatitis B surface antigen (HBsAg) among Tibetan refugees in Dehradun and its associated risk factors.

Methods: Hepatitis B virus (HBV) seroprevalence was studied among the 369 inmates of a residential Tibetan educational and vocational training institute in Dehradun by using commercial HBsAg detection kits. A standard questionnaire was filled for all participants comprising information on possible risk factors associated with hepatitis B transmission.

Results: Seroprevalence of Hepatitis B was 6% among Tibetan refugees in Dehradun. It was noted to be higher among the recently immigrated first generation Tibetans than those living in India for two to three generations. History of previous blood transfusion was a significant risk factor for HBsAg positivity followed by family history of hepatitis B.

Conclusion: An intermediate level of endemicity of hepatitis B infection exists amongst Tibetans in exile of Uttarakhand, India. Immediate multipronged measures are need of the hour.

Keywords: seroprevalence, hepatitis B, Tibetans, India

INTRODUCTION

Liver infection caused by Hepatitis B virus (HBV) which frequently leads to chronic liver disease, liver cirrhosis, and liver cancer is usually life threatening. It has emerged as 10th leading cause of death and is a established major global health problem. HBV related hepatocellular carcinoma (HCC) is the 5th most frequent cancer worldwide. The hepatitis B surface antigen (HBsAg) in serum is the first seromarker to indicate active HBV infection, either acute or chronic. The finding of HBsAg in serum is indicative of chronic HBV infection unless the person has signs or symptoms of acute hepatitis. Prevalence of HBV infection varies greatly in different parts of the world. Prevalence of hepatitis B surface antigen (HBsAg) in India varies from 1 to 13 per cent, with an average of 4.7 per cent.¹ India comprises of multiracial communities

with wide variations in ethnicity and cultural patterns.² Tibetans has been living in India in exile since 1959, and yet more are coming every year. The seroprevalence of hepatitis B has been found to be high in Tibetans in various studies.²⁻⁷ There is no conclusive data on current status of hepatitis B seroprevalence among Tibetans living in India especially in northern India. Previous studies done almost a decade ago have noted the seroprevalence of 21 %.⁸ In this background the present study was undertaken to determine the prevalence of hepatitis B surface antigen in Tibetan refugees in Dehradun, the capital city of Uttarakhand and the various risk factors associated with its transmission.

MATERIALS AND METHODS

Hepatitis B seroprevalence was studied among (n= 369) the inmates of a residential Tibetan

educational and vocational training school at Dehradun, by using commercial hepatitis B detection kits. Prior permission was obtained from the school administration. Demographic data was obtained by using a questionnaire, which included name, age, sex, generation of the index case in India (i.e. the children and grandchildren of previously migrated Tibetans were labeled as second generation ; and recent immigrants as first generation immigrants) and various risk factors associated with hepatitis B transmission like previous history of transfusion of blood and blood products, past history of dental extraction, personal history of IV drug abuse, multiple sexual partners, alcohol ingestion, smoking, tattooing, occupational exposure like health care worker, family history of hepatitis B positivity as well as prior hepatitis B vaccination status.

Blood sample to obtain serum was collected from each participant for the qualitative detection of HBsAg using commercially available kits on the principle of sandwich immunoassay (Hepacard, J. Mitra & Co Private Ltd, India).

Statistical analyses were performed using appropriate statistical tests. The Chi-square test was utilized in assessing statistical significance of association that could exist between measured variables. P value <0.05 was considered as significant. Odds ratio (OR) and 95% confidence interval (CI) were used to measure the strength of association.

RESULT

The participants enrolled in the study were in the age group 11 to 25 years, mean \pm S.D was 15.42 ± 2.66 ; with 167 (45.3%) males and 202 (54.7%) females . 150 (40.7%) subjects were

from first generation and 219 (59.3%) from second generation (table 1).

Table.1. Risk Factors analysis for Hepatitis B transmission

Sex	Reactive	Non-Reactive	OR	(95% CI)	χ^2	P Value	Sig/NS
Male	10 (45.5%)	157 (45.2%)	1.01	(0.42-2.40)	0	0.985	NS
Female	12(54.5%)	190(54.8%)					
Generation							
1st	15 (68.2%)	135 (39.9%)	3.37	1.34-8.47	7.35	0.007	Sig
2nd	7(31.8%)	212(61.1%)					
Blood Transfusion							
Yes	3(13.6%)	210.6%)	27.16	4.28-172.35	26.32	0	Sig
No	19(86.4%)	345(99.4%)					
IV Drug user							
Yes	3 (13.6%)	45 (13%)	1.06	0.30-3.73	0.01	0.928	NS
No	19(86.4%)	302(87%)					
Multiple Sex partner							
Yes	0(0%)	1(0.3%)	1	0.997-1.01	0.06	0.801	NS
No	22(100%)	346(99.7%)					
Dental extraction							
Yes	10(45.5%)	211(60.8%)	0.54	0.23-1.28	2.03	0.154	NS
No	12(54.5%)	136(39.2%)					
Family H/O HBV							
Yes	5 (22.7%)	25 (7.2%)	3.79	1.29-11.12	6.67	0.01	Sig
No	17(77.3%)	322(92.8%)					
Vaccination							
Yes	13 (59.1%)	154 (44.4%)	1.81	0.75-4.35	1.81	0.179	NS
No	9(40.9%)	193(55.6%)					
Alcohol							
Yes	2(9.1%)	10(2.9%)	3.37	0.69-16.42	2.54	0.111	NS
No	20(90.9%)	337(97.1%)					
Smoking							
Yes	3 (13.6%)	16 (4.6%)	3.27	0.88-12.19	3.45	0.063	NS
No	19(86.4%)	331(95.4%)					
Tattooing							
Yes	0(0%)	1(0.3%)	1	0.997-1.01	0.06	0.801	NS
No	22(100%)	346(99.7%)					

The overall seroprevalence rate of HBsAg was 6%(22/369). Of the 22 positive respondents, 10 were males and 12 were females. This difference was statistically insignificant however there was statistically significant difference found in age specific seroprevalence in different age groups (P value 0.006). It was highest in age group 15-17 yr 59 % (table 2).

Table.2. Age specific distribution of subjects according to Hepatitis B seroprevalence

		AGE (in years)				Total
		12-14	15-17	18-20	21-23	
Reactive	No.	3	13	3	3	22
	%age	13.6%	59.1%	13.6%	13.6%	100.0%
Non-Reactive	No.	158	116	58	15	347
	%age	45.5%	33.4%	16.7%	4.3%	100.0%
Total	Count	161	129	61	18	369
	%age	43.6%	35.0%	16.5%	4.9%	100.0%

The first generation had significantly more exposure to smoking (p .01; χ^2 6.403) and alcohol (p .06; χ^2 3.480) compared to second generation. On the other hand, dental procedures were significantly more in second generation (p value 0.00).

The significant risk factors contributing towards

seropositivity were Tibetans migrated to India in past few years, history of transfusion of blood and a positive family history of hepatitis B. A statistically significant difference was noticed among seropositive subjects from first versus second generation; with 15 (68%) and 7 (32%) respectively ($p .007$). History of prior blood transfusions also was found to be significantly related to HBV seropositivity ($p .00$).

History of at least one family member suffering with hepatitis B was present in 8% of the subjects. Out of 12 first generation subjects with a positive family history of hepatitis B, 4 were seropositive (i.e. 33.3%) as compared to 1/18 (5.55%) from 2nd generation. Thus suspected familial transmission rate was almost six times in the 1st generation immigrants as compared to 2nd generation immigrants.

The vaccination coverage of the study group was found to be only 45% however despite having received vaccine in the past 59% subjects were seropositive; although adequacy of the vaccination could not be ascertained. Second generation participants were vaccinated significantly more as compared to first generation 118:49 (70.7% versus 29.3%). 7/49 (14%) of first generation Tibetans as against 6/118 (5%) 2nd generation immigrants despite of vaccination, were seropositive. Thus, not only the vaccination coverage of recent Tibetan immigrants lower than expected, the adequacy of vaccination was also poor.

DISCUSSION

The prevalence of Hepatitis B in India was found to be 2.4% according to a meta-analysis conducted in 2007.⁹ According to another

group of authors; the corrected prevalence of carrier rate is much lower at 1.42%.¹⁰ The seroprevalence of HBsAg was found to be 2.8% in a recent hospital based general population study from Uttarakhand state.¹¹ This study revealed HBsAg positivity rate of 6% amongst Tibetans in exile in Dehradun.

The prevalence of HBV varies from country to country and depends upon a complex mix of behavioural, environmental and host factors. It has been found to be high in Tibetan population in various studies.^{3,5,7,8} Prevalence of HBV infection and HBsAg was 61% and 16% among Tibetans residing in Nepal⁵; 21.2% in the Idu Mishmi tribe in Arunachal Pradesh which has common ancestral roots with the Lobha tribe of Tibet⁷; 21%, in a study done fifteen years ago in 1998 in Tibetan refugees' population in Dharmsala district of Himachal Pradesh in Northern India.⁸ Our data of 6% seroprevalence from healthy North Indian Tibetans is higher than the Indian average data but much lower than the previously documented 21% from north Indian Tibetan population. High prevalence in their ancestral homeland (Tibet) might explain the high prevalence in the present study.

Analysis by gender reveals that there was no significant difference in the seroprevalence of hepatitis B among males and females; similar to the findings of a study done in 2001.³ Another study in Tibetans in Arunachal Pradesh found a male preponderance.⁷

The significant risk factors contributing to seropositivity in this study were recent immigrants to India, previous blood transfusions and family history of hepatitis B. Significantly higher prevalence of HBsAg among family members, parent and offspring was also

observed in another study from Tibetan population.⁷

The seroprevalence was almost three times among the first generation immigrants who had immigrated to India recently, than those residing in India for past few generations. Only 45% participants in the study had received hepatitis B vaccine in spite of WHO recommendation of routine infant vaccination along with catch-up immunization for adolescents and high risk populations. Vaccination coverage of the first generation immigrants who had come to India in last few years was only 30%. The higher seroprevalence rates and low vaccination coverage among first generation recent immigrants reflects the poor health status of the country of their origin.

Prevention and control can be achieved through safe and effective HBV vaccines as well as identifying carriers to complement vaccination strategies for elimination of HBV transmission. New arrivals may be screened,

educated and vaccinated. This strategy is likely to bring down the high prevalence rate of hepatitis B seroprevalence among this community.

CONCLUSION

There is an intermediate level of endemicity of hepatitis B infection amongst Tibetans in exile of Uttarakhand, India. Immediate implementation of multipronged measures is the need of the hour in order to decrease the prevalence of the disease within this closed community.

AUTHOR NOTE

Bindu Aggarwal, Associate Professor of Pediatrics :

(**Corresponding Author**);

Email: binduaggarwal@rediffmail.com

Sanjay Gupta, Associate professor of Medicine Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, Uttarakhand, India-248001

REFERENCES

1. Kurien T, Thyagarajan S.P, Jeyaseelan L, Peedicayil A, Rajendran P, Sivaram S et al. Community prevalence of hepatitis B infection & modes of transmission in Tamil Nadu, India. *Indian J Med Res.* 2005; 5: 670-675
2. Datta S. An overview of molecular epidemiology of hepatitis B virus (HBV) in India. *Virology Journal.* 2008; 5:156.
3. Zhao SM, Li HC, Lou H, Lu XX, Yu XF, Gao DH. High Prevalence of HBV in Tibet, China. *Asian Pacific Journal of Cancer Prevention.* 2001; 2:299-304.
4. Shrestha SM, Shrestha S. Chronic hepatitis B in Nepal: An Asian country with low prevalence of HBV Infection. *Tropical Gastroenterology.* 2012;33(2):95-101.
5. Shrestha SM, Takeda N, Tsuda F, Okamoto H, Shrestha S, Shrestha VM. High prevalence of hepatitis B virus infection amongst Tibetans in Nepal. *Tropical gastroenterology.* 2002; 23(2): 6.
6. Chiba H, Toshiro T, Neupani D, Kim J, Yoshida S, Mizoguchi E. An epidemiological study of HBV, HCV and HTLV-I in Sherpas of Nepal. *Asian Pacific J Cancer Prev.* 2004; 5:370-373.
7. Biswas D, Borkakoty BJ, Mahanta J, Jampa L, Deouri LC. Hyperendemic foci of hepatitis B infection in Arunachal Pradesh, India. *J Assoc Physicians India.* 2007; 55: 701-4.
8. James A Litch, John R Shackleton, Rachel A Bishop. Prevalence of hepatitis B infection among Tibetan refugees in northern India. *Tropical Doctor.* 1998; 28: 229-230.
9. Batham A, Narula D, Toteja T, Sreenivas V, Puliye JM. Systematic Review and Meta analysis of Prevalence of Hepatitis B in India. *Indian Pediatrics.* 2007; 44: 663-674.
10. Phadke A, Kale A. HBV carrier rate in India. *Indian Pediatr.* 2002; 39:787-788.
11. Mittal G, Gupta P, Gupta R, Ahuja V, Mittal M, Dhar M. Seroprevalence and Risk Factors of Hepatitis B and Hepatitis C Virus Infections in Uttarakhand, India. *J Clin Exp Hepatol.* 2013; 3:296-300.