ORIGINAL RESEARCH PAPER

Volume-7 | Issue-12 | December-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

SEROPREVALENCE OF HEPATITIS-B VIRUS IN KUMAUN REGION OF UTTARAKHAND

Microbiology

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ABSTRACT

Background: Hepatitis B virus is a partially double-stranded circular DNA virus and is a member of the Hepadnaviridae family. The virus consists of a core capsid which contains viral DNA and this is surrounded by an envelope containing surface antigen (HBsAg). Both whole, incomplete virus particles, consisting entirely of HBsAg, are produced during replication of HBV. The HBsAg particles vary greatly in morphology and are found in high concentrations in early acute infection and continue to be produced in chronic disease.1

Objective: To evaluate the seroprevalence of hepatitis B surface antigen among patients in a tertiary care health centre of Kumaun region of Uttarakhand.

Materials and methods: The prevalence of hepatitis B surface antigen (HBsAg) was studied in 37169 patients of all age groups and gender (19430 females and 17739 males) who required blood investigations for different medical reasons. Blood samples collected during January 2017 to August 2018, were tested for HBsAg using a sandwich ELISA based immunochromatic test.

Results: Of the 37169 patients tested, 719 (1.93%) were positive for HBsAg. Out of these, 387(53.82%) were females and 332 (46.18%) were males. The results revealed that hepatitis B infection was highest in age group of 21-30 years of age.

Conclusion: This study demonstrates that screening tests can be pivotal in identifying HBsAg and it is advocated that a program for education, vaccination and prophylaxis must be implemented in all health care set ups.

KEYWORDS

INTRODUCTION

Hepatitis B virus (HBV) infection is a major health problem. According to World Health Organization (WHO), 2 billion people are infected with HBV worldwide. Out of these, 240 million land into chronic hepatitis B infection.[1,2] Hepatitis-B is the 10th leading cause of death in the world. On the other hand hepato-cellular carcinoma (HCC) ranks 5th among the most frequent cancer in human.[4] Every year 4 million acute clinical cases of HBV occur and about 25% of those become carriers. According to WHO survey more than 2000 million people today have been infected with HBV at sometime in their lives. Of these, about 350 million lead to chronic hepatitis B infection and become carriers of the virus.75% of the world's population live in high endemicity areas. One million people die in a year from chronic active hepatitis, cirrhosis or primary cancer[6].

India has 5 to 7% of the world's population and hepatitis-B is a major health problem with a prevalence of 2-10%[7,5]. The overall carrier rate is estimated to be 4.7%.[8] The number of HBsAg carriers in India has been estimated to be over 40million (4crore). It is reported that approximately 15 to 40% of the hepatitis-infected patients are likely to suffer from liver cirrhosis, liver failure and hepato-cellular carcinoma[3]. Infection can be transmitted through trans-placental route during pregnancy, natal route during delivery, or post natal route through breast milk[10-12]. Transplacental transmission of HBV to the fetus may be due to hematogenous route or cellular transfer; the placental tissue is infected by the high titer of HBV present in maternal blood and transfer effected from mother to fetus through the villous capillary endothelial cells[13].

Screening is one of the procedures by which disease can be diagnosed in its early stage and the possible steps can be adopted in time to reduce the morbidity and mortality.

AIMS AND OBJECTIVES:

To evaluate the seroprevalence of hepatitis B surface antigen among patients in a tertiary care health centre of Kumaun region of Uttarakhand.

MATERIALS AND METHODS

The present data based on observational study, was conducted in Government Medical College Haldwani and associated Dr. Sushila Tiwari Government Hospital, Haldwani, Nainital, Uttarakhand from January 2017 to August 2018. A total of 37169 patients of all age group and sex were included in the study. An awareness based pre-tested schedule was administered to each patient to collect the data on socio-demographic profile and the other data of relevance viz. History about vaccination, smoking, drinking, unprotected sex, needle prick injury, intravenous drug abuse and tattooing the skin etc. An informed consent for blood sample collection was obtained from every patient. One mL of venous blood was drawn from each patient, with appropriate antiseptic precautions and collected in plain sterile glass test tube and then allowed to clot. The immuno-chromatographic tests (ICT) were performed according to the manufacturer's instructions provided in the kit (Crystal HBsAg)[14] which is based on principle of Sandwich ELISA. The patients found positive for HBsAg were considered as positive for Hepatitis B.

OBSERVATIONS & RESULTS

Among 37169 blood sample from the patient, 1.93% of the blood were found to be reactive for HBsAg as shown in table 01. Out of 1.93% of reactive blood sample, male were 47.73% & female were 52.27% [table no 02]. The maximum positive cases were found among the patients of 21-30 years,(25.17%) followed by the age group of 31-40 years [table no 03]. Table no 04 shows the risk factor associated with reactive HBsAg patients which showed alcoholism is most commonly associated as shown in table 5. Out of total positive patients 52.02% of the patients were from rural areas as discussed in table no 4. 11.96% and 20.03% patients whose sample was reactive for HBsAg gives family history of positive hepatitis B infection and blood transfusion respectively as shown in table 9 and 10 also 32.13% of the patients among positive cases were taken vaccine against hepatitis B[table 6].

Table 01: Distribution of Patients according to Outcome of Screening Test

Outcome of Screening test	No. of Patients	Percentage (%)
Positive	719	1.93%
Negative	36450	98.07%
Total	37169	

Table 02: Distribution of positive Patients According to Gender

Parameters	Total cases	Total positive cases (%)
Gender		
Male n (%)	17739 (47.73%)	332 (46.18%)
Female n (%)	19430(52.27%)	387 (53.82%)
Total	37169	719 (1.93%)

Table 03: Distribution of positive Patients According to Age

	Total cases			Total Positive cases		
	Male ()	Female ()	Total ()	Male ()	Female ()	Total ()
Age (in years)						
<10 n (%)	1991 (11.22%)	1729(8.89%)	3720(10%)	29 (8.73%)	39(10.08%)	68(9.46%)
11-20 n (%)	4274 (24.09%)	4984(25.65%)	**9258(24.91%)**	72(21.69%)	79(20.41%)	**151(21.00%)**
21-30 n (%)	4567(25.75%)	4701(24.19%)	9268(24.93%)	87(26.20%)	94(24.29%)	181(25.17%)
31-40 n (%)	4206(23.71%)	4672(24.04%)	8878(23.88%)	81(24.39%)	85(21.96%)	166(23.09%)
41-50 n (%)	1542(8.69%)	2078(10.69%)	3620(9.74%)	32(9.64%)	48(12.40%)	80(11.13%)
>50 n (%)	1159(6.53%)	1266 (6.52%)	2425(6.52%)	31(9.34%)	42(10.85%)	73(10.15%)
TOTAL	**17739**	**19430**	**37169**	**332**	**387**	**719**

Table 04: Distribution of positive Patients According to Residential area

Residential area	Total cases	Total positive cases
Rural n (%)	18976	374 (52.02%)
Urban n (%)	18193	345 (47.98%)
Total	37169	719

Table 05: Distribution of positive Patients According to Risk factors

Risk Factors	No. of patients	Percentage (%)
Smoking	73	10.15%
Tobacco chewing	47	6.54%
Alcoholism	392	54.53%
Alcohol and smoking	58	8.06%
None	149	20.72%
Total	**719**	

Table 06: Distribution of positive Patients According to Vaccination Status before Infection

Vaccination status	No. of patients	Percentage (%)
Vaccinated	231	32.13%
Non- vaccinated	488	67.87%
Total		

Table 07: Distribution of positive Patients According to marital status

Marital Status	No. of patients	Percentage (%)
Married	503	69.96%
Unmarried	216	30.04%
Total		

Table 08: Distribution of positive Patients According to Family history of hepatitis-B infection

Family history of hepatitis infection	No. of patients	Percentage (%)
Yes	86	11.96%
No	633	80.04%
Total		

Table 09: Distribution of positive Patients According to history of blood transfusion

History of blood transfusion	No. of patients	Percentage (%)
Yes	144	20.03%
No	575	79.97%
Total		

DISCUSSION

In the present study, out of 37196, only 719 (1.98%) patients were found positive in the screening for HBsAg. In the present study, the prevalence of Hepatitis B was found to be (1.98%) The reported prevalence from earlier studies in India was similar. Singhvi *et al.,* (2000) reported the prevalence of HBV infection as 2.84% from Vellore in1990, this study was conducted in voluntary blood donors (VBD) and replacement blood donors (RBD). Almost similar prevalence i.e. 2.59% reported by Thakur *et al.,* from Himachal Pradesh in VBD, once more the reported difference is not much from the observed prevalence in present study. Elavia *et al.,* reported similar prevalence i.e. 2.02% from Blood donor's community from Mumbai. Irshad *et al.,* reported little higher prevalence as 2.59% from Jodhpur in VBD. Nijhawan *et al.,* reported almost similar prevalence as 2.1% from Navi Mumbai in community of VBD. Ahmed *et al.,* from Jodhpur reported the prevalence as 2.4% from general community. Joshi *et al.* , also reported almost similar prevalence as 2% from Chandigarh in VBD. From Lucknow Singh *et al.* , (2003) reported the similar prevalence as 2.05% in VBD. Warner *et al.,* from rural Punjab community has reported a higher prevalence i.e. 3.4%, where this reported prevalence was higher than the observed prevalence in RBD and VBD community from same state. Chandrashekharan *etal.,* reported the higher prevalence as 4.12% from Madurai in VBD. 3.43% prevalence has been reported by Garg *et al.,* from Jodhpur in VBD community in 2001. Ganju *et al.,* reported the prevalence of HB as 3.5% in antenatal and STD clinic attendees from Jodhpur. Mahalaxmi *et al.,* from community of eye donors from Chennai reported the prevalence of HBV as 3.5% .

The maximum percentage of positive patients were found in age group (21-30) years. This is the same age group in which maximum(25.75%) patients, were enrolled. This higher prevalence may be due to higher number of patients in this age group.

The vaccination status revealed that only 32.13% of the positive tested patients had received vaccines against Hepatitis–B.

Regarding the presence of risk factors, the present study revealed that 11.96% of positively tested patients have positive family history of Hepatitis B. Close contact with Hepatitis- B positive persons, greatly enhances the chance of transmission as presence of virus has been documented in several body fluids[14-15,16-22]. The chances of higher transmission is also revealed by the study of Choudhry *et al.*, in which they have reported 2.96% prevalence of Hepatitis-B in family members of asymptomatic carriers from WestBengal. 20.03% of positively tested patients gave the history of blood transfusion.

CONCLUSION

The study was conducted to know the burden of hepatitis in the kumaun region, so that certain measures could be taken to prevent the spread of disease. In the present study, sandwich ELISA based kits were used to identify the hepatitis infected patients. It has come out to be an excellent screening method to identify the infection and begin with the treatment. This study has highlighted the magnitude of infection in this area.

ACKNOWLEDGEMENTS

The authors thank the technical staff members of the department of microbiology for their excellent technical assistance as well as the doctors and technicians of Dr. Sushila Tiwari Government Hospital for their help during this study.

REFERENCES:

1. WHO. Hepatitis B. World Health Organization Fact Sheet No 204. World Health Organization; 2014 July [cited2014Dec07]. Availablefrom:http:// www.who.int/ mediacentre/ factsheets/fs204/en/.
2. Goldstein ST, Zhou F, Hadler SC, Bell BP, Mast EE, Margolis HS. A mathematical model to estimate global hepatitis B disease burden and vaccination impact. IntJEpidemiol 2005Dec; 34(6):1329-1339.
3. WHO. HepatitisB: World Health Organization Fact Sheet 204. World Health Organization; 2000 [Cited2000Dec]. Availablefrom:http://www.who.int/mediacentre/ factsheets/ fs204/en/.

4. Chen, D.S., (2010). Toward elimination and eradication of Hepatitis-B, Journal of Gastroenterology and Hepatology, 25, pp.19-25.
5. Sarin, S.K., (2009). HBV prevalence, natural history, and treatment in India and Indian Americans in United States, Current Hepatitis Reports, 8,pp.31-38.
6. Anonymous, (2002). World Health Organization, Department of Communicable Disease, Surveillance and Response HepatitisB, Report No. WHO/CSR/LYO/2002,p.2.
7. Kant, L. and Hall, A.J., (1995). Epidemiology of childhood hepatitis in India: Vaccination related issues, Indian Journal of Paediatrics, 62,pp.635-653.
8. Mann, A. and Arora,U., (2007). Prevalence of hepatitis-B virus, hepatitis-C virus, and HIV in patients with chronic liver disease in Amritsar, JIACM, 8(1),pp.29-37.
9. Khan, M.A., Ashraf, M., Rehman, A., Ali,A., Ashraf,A. and Ditta, A., (2006). Prevalence of HBV, HCV, HIV in blood donors at Liyaqatpur, Professional Medical Journal, 13(1), pp.23-26.
10. YanY, XuD, WangW. The role of placenta in hepatitis virus intrauterine transmission. Zhonghua Fu Chan Ke Za Zhi 1999 Jul; 34(7):392-395.
11. XuD, YanY, XuJ. A molecular epidemiologic study on the mechanism of intrauterine transmission of hepatitis B virus. Zhonghua Liu Xing Bing Xue Za Zhi 1998 Jun;19(3):131-133.
12. Xu D,YanY, Zou S , Choi BC, Wang S, Liu P, Bai G, Wang X,ShiM,WangX. Role of placental tissues in the in the intra-uterine transmission of hepatitis B virus. AmJObstet Gynecol 2001 Oct;185(4):981-987.
13. AbrahamP. Viral hepatitis in India. ClinLabMed 2012 Jun;32(2):159-174.
14. Anonymous, (December2006). A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis-B Virus Infection in the United States, Department of Health and Human Services, Centre for Disease Control and Prevention, 55(RR-16),pp.1-40.
15. Anonymous, (September2008). Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis-B Virus Infection, Department of Health and Human Services, Centre for Disease Control and Prevention, 57(RR-8),pp.1-28.
16. Carey, W.D., (2009). The prevalence and natural history of hepatitis-B in the 21stcentury, Cleveland Clinic JournalofMedicine,76(3),pp.52-55.
17. Mahoney, F.J., (1999). Update on diagnosis, management and prevention of hepatitis-B virus infection, Clinical Microbiology Reviews,12(2),pp.351-366.
18. Feldman,M., Sleisenger, M.H. and Scharschmidt, B.F.,(1998). Sleisenger and Fordtran's Gastrointestinal and Liver Disease, Vol.2,6thEdn., WB Sounders Company, pp.1123-1170.
19. Singh,J., Bhatia,R., Khare,S., Patnaik, S.K.,Biswas,S.andLal,S.etal.,(2000). Community studies on prevalence of HBsAg into urban populations of Southern India, Indian Journal of Paediatrics,37,pp.149-152.
20. Vaccine information for the public and health professionals [internet] cited 2010 June28, Available from, http://www.vaccineinformation.org/hepb.
21. Risbud,A., Mehendale,S. etal.,(2002). Prevalence and incidence of hepatitis-B virus infection in STD clinic attendees in Pune,India, SexTransInfeel.,78,pp.169-173.
22. Anonymous, (May2009). Surveillance for acute viral hepatitis–United States 2007, Department of Health and Human Services, Centre for Disease Control and Prevention, 58 (SS-3),pp.1-32.