International Journal of Research in Medical Sciences
Vazhavandal G et al. Int J Res Med Sci. 2014 Feb;2(1):310-313
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: 10.5455/2320-6012.ijrms20140259

Research Article

Seroprevalence of hepatitis B virus among patients at a rural tertiary health care centre in South India: a four year study

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Received: 2 January 2014
Accepted: 7 January 2014

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ABSTRACT

Background: Infection with the Hepatitis B Virus (HBV) is a global health problem. Epidemiological studies worldwide show wide variations in the prevalence patterns of the Hepatitis B infections. Early detection can contribute substantially to the timely diagnosis of the patients with acute illnesses and to an early treatment and hence, it can limit the transmission of the infection.
Aim: To provide a baseline data on the prevalence of Hepatitis B among the patients who were attending Chennai Medical College Hospital and Research Centre, Trichy, Tamilnadu, over a period of 4 years (2010-2013).
Methods: This was a retrospective study which was carried out among 19,513 patients who were attending the rural tertiary care teaching hospital, Trichy, over a period of 4 years (January 2010 – December 2013). The sera were screened for the presence of Hepatitis B surface antigen (HBsAg) by HEPACARD. Those found positive on screening test were confirmed by Enzyme linked Immuno-sorbent Assay (ELISA) test.
Results: Out of 19,513 sera which were studied, 315 (1.61%) were sero-positive cases. Among the positive cases (315), the seroprevalence in males and females were 73% (230) and 27% (85) respectively and the frequency of HBV among age groups 0-20, 21-40, 41-60, >60 was 5.07% (16), 45.07% (142), 35.9% (113),11425% (36) respectively. Among the positive cases, a majority were in the age group of 21 to 40 years, with a male preponderance ($p<0.05$).
Conclusion: The overall prevalence for this HBsAg marker among the patients who attended the rural tertiary teaching hospital in this study was comparatively similar to that which was reported by other studies from India.

Keywords: ELISA, Hepatitis B virus (HBV), Hepatitis B surface antigen, Immunoassay, Sero prevalence

INTRODUCTION

Hepatitis B virus infection is one of the major global public health problem. HBV infection is the 10th leading cause of death and HBV related hepatocellular carcinoma (HCC) is the 5th most frequent cancer worldwide.[1] About more than 2 billion of the world's population has serological evidence of past or recent HBV infection and there are more than 350 million chronic carriers of this infection.[2] Approximately 1 million persons die annually from HBV related chronic liver diseases including severe complications such as liver cirrhosis (LC) and hepatocellular carcinoma (HCC).[1]

In India, HBsAg prevalence among the general population ranges from 2 to 8%, which places India in an intermediate endemic zone for HBV.[2,3] HBV infection is predominantly acquired at an early age in developing countries, which includes vertical transmission from mother to child, perinatal transmission, and horizontal transmission from child to child. However HBV can also be transmitted sexually (both homo and hetero sexual)

accounts for a majority of the transmission occurring in adult life.[4]

The clinical spectrum of HBV infection ranges from subclinical to acute symptomatic hepatitis or rarely fulminant hepatitis during the acute phase, inactive carrier state to chronic hepatitis. HBsAg is the first seromarker to indicate active HBV infection either acute or chronic. It would appear in patient's serum usually 2-10 weeks after being infected with HBV before liver enzymes are increased or clinical symptoms appear. In chronic HBV infection the HBsAg remains elevated for more than 6 months.[5]

HBV circulates in high titres in blood and low titres in other body fluids and is hundred times more infectious than HIV infections and ten times more than HCV.[6]

There are very few studies which are available regarding the prevalence of HBV among the patients in the southern part of Tamilnadu. Hence the present study was undertaken to estimate the seroprevalence of HBV in both sexes and different age groups in our hospital.

METHODS

The present study was carried out in patients attending outpatient and inpatient departments of our tertiary care hospital, Trichy, India.

These tests were done as part of preoperative screening, antenatal screening, screening on haemodialysis patients, on patients suspected to have HBV infection after getting a verbal consent. The sera were screened for the presence of HBsAg by a rapid test kit based on the principle of one step immunoassay (HEPACARD- Diagnostic enterprises). Those found positive on screening test were confirmed by third generation ELISA kits (Hepalisa; J Mitra and Co. Pvt. Ltd., New Delhi, India) according to the manufacturers protocol. The results were analyzed using chi-square test.

RESULTS

Out of 19,513 individuals screened between 2010-2013, 315 (1.61%) were HBsAg positive. The age and sex wise distribution of individuals were shown in Table 1 & 2. Among the 19,513 individuals 9,929 (50.9%) were males and 9,584 (49.1%) were females. Among the positive cases (315), the seroprevalence in males and females was 73% (230) and 27% (85) respectively and the frequency of HBV among age groups 0-20, 21-40, 41-60, >60 was 5.07% (16), 45.07% (142), 35.9% (113), 11.42% (36) respectively. Highest prevalence was observed among subjects of 21-40 years age group (1.7%), followed by 41-60 years age group (1.65%) with male preponderance ($p<0.05$).

Table 1: Gender wise prevalence of HBV.

Year	Male tested	Male positives	Female tested	Female positives	Total tested	Total positives
2010	963	30 (3.1%)	1,137	10 (0.88%)	2100	40 (1.9%)
2011	2,042	49 (2.4%)	1,872	27 (1.44%)	3,914	76 (1.94%)
2012	3,532	81 (2.3%)	3,125	28 (0.9%)	6,657	109 (1.64%)
2013	3,392	70 (2.1%)	3,450	20 (0.58%)	6,842	90 (1.32%)
Total	9,929	230 (2.32%)	9,584	85 (0.89%)	19,513	315(1.61%)

Table 2: Year wise and age wise prevalence of HBV.

Year	0-20 yrs		21-40 yrs		41-60 yrs		>60 yrs		Total	
	Tested	Positives	tested	Positives	Tested	positives	tested	positives	Tested	Positives
2010	173	2	1030	23	708	12	189	3	2,100	40
2011	321	4	1,709	35	1,496	32	389	5	3,914	76
2012	664	7	2,700	46	2,272	39	1020	17	6,657	109
2013	781	3	2873	38	2,379	30	809	19	6,842	90
Total	1939	16(0.83)	8,312	142(1.7)	6855	113(1.65)	2,407	36(1.5)	19513	315(1.61%)

DISCUSSION

In the present study, the seroprevalence was found to be 1.61%. It was similar to that which was reported by other studies from Vellore district, Tamilnadu (1.7%), Rajasthan (0.87%), and Chennai (1.9%) (7,8,14). In a study conducted in a hospital-based population at Kathmandu Medical College Hospital, Nepal, the prevalence rate was found to be 2.5%.[9] A study on the prevalence of HBsAg in patients attending a surgical OPD in Rawalpindi, Pakistan, reported 2.28%.[10]

Chowdhury A reported that 3-4% of the Indian population are HBV infected with the highest prevalence among the aborigines of Andaman as well as from Arunachal Pradesh.[13]

The prevalence of Hepatitis B varies from country to country and there is a wide variation in the prevalence in different regions of our country. The difference may be because of the type of population studied, different geographical region, genetic factors, health factors and socioeconomic status. In general, it is lowest in countries or areas with high standards of living like effective vaccination, improved sanitation and safe transfusion measures (e.g., Australia, North America, North Europe) and highest in countries or areas with low socioeconomic Levels (e.g., China, South East Asia, South America).

In our study, there was an increase in the prevalence among the male population as compared to that in females, as shown in table 1 and a majority of them belonged to the age group of 21-40 years, as shown in table 2. In accordance with our study, Dutta et al[11] and Sood S et al[8] also reported higher male preponderance. No possible explanation has been given for the higher prevalence in males in the general population but probably higher exposure to occupational HBV risk factors in man or else females clear the HBV more efficiently as compared to males.[12,16]

The incidence was highest among 21-40 years age group and lowest among 0-20 years. Thus these data indicate that the prevention of perinatally transmitted HBV in this locality by immunization and improvements in living standards of South Indian population. In contrast to our study, Singh J et al reported highest incidence among <5 years and then a progressive decline thereafter.[15]

CONCLUSION

To conclude, HBV causes a considerable disease burden in India with significant loss of human life. Therefore, India requires a suitable preventive strategy to target identified population groups. However, there are several gaps in the available epidemiological data that need to be addressed before a comprehensive policy can be devised for control of HBV infection in India.

However, an effective immunization programme is changing an epidemiological situation very fast with decrease in the prevalence as well as impact of HBV infection.

ACKNOWLEDGEMENTS

The authors are thankful to Microbiology Department, Chennai Medical college Hospital and Research Centre, Irungalur, Trichy, Tamilnadu, India.

Funding: None
Conflict of interest: None declared
Ethical approval: Not required

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DOI: 10.5455/2320-6012.ijrms20140259
Cite this article as: Vazhavandal G, Vallab Ganesh BB, Uma A, Chitra RP. Seroprevalence of hepatitis B virus among patients at a rural tertiary health care centre in South India: a four year study. Int J Res Med Sci 2014;2:310-3.