Original Article

Seroprevalence of Hepatitis B Surface Antigen Positive Patients Attending a Tertiary Care Hospital in Srikakulam, Andhra Pradesh

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ABSTRACT

Background: Hepatitis B virus (HBV) infection continues to be a serious public health problem globally and studying the prevalence of HBV infection in a geographical area aids in establishing magnitude of the problem. A teaching hospital based population study of Hepatitis B surface antigen (HBsAg) is a strong indicator of true HBV infection rate in the community as large number of patients from different backgrounds attend the hospital.

Methods: A one step rapid immunochromatographic method for detection of HBsAg was performed to diagnose HBV infection. 24,028 sera samples were tested over a period of one year 9 months.

Result: Out of the 24,028 samples tested for HBsAg, 733 (3.05%) were found to be positive for HBsAg. Positivity rate was more among males 440 (60.02 %) than females 293 (39.97 %) and the most common age group in males was 41-50 years (23.18 %) followed by 31- 40 years (22%).In females, commonest age group was 21-30 years (38.22%) followed by 31-40 years (14.67 %).

Conclusion: The study helps to know the magnitude of viral transmission in the community & to know the at risk age groups. Seroprevalence of HBsAg in Srikakulam, Andhra Pradesh was found to be 3.05% which is in accordance with the national average of 2-7 % and it falls into intermediate zone of HBsAg prevalence according to WHO.

Keywords: *Hepatitis B, HBsAg, Prevalence, Srikakulam*

Introduction

Hepatitis B virus (HBV) infection, a global health problem that causes a spectrum of disease ranging from self limiting hepatitis to acute fulminant and chronic hepatitis leading to sequelae like liver cirrhosis and hepatocellular carcinoma remains the 10th leading cause of death and 5th most frequent cancer worldwide.[1,2] It causes 60 -80% of all primary liver cancers, and 30 % of the world's population show serological evidence of current or past infection with HBV.[3]

To understand and assess the magnitude and dynamics of transmission of a disease in a community and for its control and prevention, the assessment and study of its prevalence is very important. This study was undertaken to estimate the burden of HBV infection in this part of country, and to compare with the prevalence rates in different parts of India.

Materials And Methods

The study was conducted at Rajiv Gandhi Institute of Medical Sciences (RIMS), Srikakulam, Andhra Pradesh from January 2015 to September 2016.After obtaining permission from Institutes ethics committee, patients who registered at the OPDs or were admitted to the IPDs of the hospital were included in the study. Blood sample to obtain serum was collected with standard precautions.

A 5 ml venous blood sample was collected from all patients .The blood was allowed to clot for 45 mins at room temperature and the serum was separated after centrifugation.The serum sample was then subjected to the test. A one step rapid immunochromatographic assay(ICA) Aspen(Aspen Laboratories Pvt. Ltd ,Delhi) kit with sensitivity of > 99.9 % and specificity of 99% for qualitative detection of HBsAg was employed.

Results

Sera of 24,028 patients were tested for HBsAg over a period of one year nine months from January 2015 to September 2016. 733 Patients (3.05 %) were tested positive for HBsAg. Positive prevalence was higher among males 440(60.02 %) compared to that of females 293(39.97%). Analysis of age distribution of HBsAg positive cases in both genders revealed a higher prevalence of HBsAg among men of

age 41-50 years 102(23.18 %) followed by 31-40 years 97 (22.04 %). (Table 1) In females, highest prevalence was seen among 21 -30 years age group 112(38.22 %) followed by 31- 40 years age group 43(14.67%). (Table 1)

Table 1: Age wise Distribution of HBsAg positive male patients (n=440) & female patients (n=293).

Age	male patients (n=440)		female patients (n=293)	
	No.of HBsAg positive sera	Percentage (%)	No.of HBsAg positive sera	Percentage (%)
0-10	6	1.36	2	0.68
11-20	19	4.31	38	12.96
21-30	68	15.45	112	38.22
31-40	97	22.04	43	14.67
41-50	102	23.18	39	13.31
51-60	83	18.86	41	13.99
61-70	54	12.27	16	5.46
>71 & above	11	2.5	2	0.68

Table 2: Comparison of Prevalence of HBV with various studies in India.

Author	Place of study	Year of study	No.of samples tested	Study Population	Prevalence (%)
Smitha Sood et al	Jaipur,Rajasthan	2007-2008	3196	General population	0.87
Sayed A.Quadri et al	Bijapur,Karnataka	2010	4283	General population	1.63
Smitha Sood	Jaipur,Rajasthan	2010-2011	9515	General population	1.73
Irfa Naqshbandi et al	Srinagar,Kashmir	2011-2013	1300	General population	1.2
Piyush et al	Ahmedabad	2005-2011	5316	Blood donors	0.3
Supekhar Shilpa et al	Gujarat	2012	1152	Students	0.694
K.S.Saraswathi et al	Hyderabad,Telangana	2010-2012	2155	Pregnant	0.9
M.Khaleel et al	Hyderabad,Telangana	2015	2500	Blood donors	1.2
Samatha et al	Andhra Pradesh	2013-2014	2851	General Population	2.42
Singh J et al	Andhra Pradesh	2000	737	General Population	3.3
Yedlapati Bhavani et al	Andhra Pradesh	2004-2009	8097	Blood donors	1.41
Chandra M etal	Andhra Pradesh	2015	800	Tribal population	5.16
Ashish Batham et al	India	2009	8,84,052	All	3.07
Present study	Srikakulam, Andhra Pradesh	2015-2016	24,028	General population	3.05

Discussion

Hepatitis B is the most common chronic viral infection in humans. Inspite of a vaccine available since 1982, the hepatitis B virus (HBV) remains a serious global public health problem.

Prevalence of HBV infection varies greatly in different parts of the world. HBV prevalence has been classified by the World Health Organisation (WHO) into high endemicity (> 8 %), Intermediate (2-7 %) and low endemicity areas (< 2%). [1] India with 40 million HBsAg carriers and about 1,00,000 deaths every year due to illness related to HBV infection, has been placed into the intermediate zone of prevalence rates by WHO.[4] Human hepatitis B virus (HBV), a small enveloped virus belonging to Hepadnaviridae family, has a partially double stranded circular deoxyribonucleic acid (DNA) that replicate by reverse transcription.[5]

The genome has four overlapping genes:S gene, C gene, P gene and X gene & 8 genotypes, A to H classified based on genetic sequence variability between genotypes of more than 8 %.

- **S gene** codes for the surface antigen (HbsAg),
- **C gene** codes for core Ag (HBcAg) and HBeAg,
- **P gene** codes for DNA polymerase enzyme and
- **X gene** codes for a small non particulate protein (HBxAg). [6]

Patients with mutations in the precore or core region fail to secrete HBeAg but continue to replicate actively causing progressive liver disease. Upto 20 % of patients who develop HBeAg seroconversion may reactivate becoming HBeAg positive again. Thus regular followup with quantitative measurement of hepatitis B virus DNA and aminotransferase levels is required after seroconversion to ensure its durability.[7]

The primary routes of transmission are perinatal,early childhood exposure,sexual contact,and per cutaneous exposure to blood or body fluids (i.e injections, needle stick, blood transfusion).[2] Other routes of transmission include nosocomial infections, organ transplantation, tattooing and high risk occupations. A large proportion of patients suffering from Hepatitis B may be aymptomatic and can transmit the disease to healthy population. [2] Serologic markers of HBV infection diagnosis vary depending on whether the infection is acute or chronic. HBsAg is the most commonly used test for diagnosing acute HBV infections or detecting carriers. [3]

In our study conducted on 24,028 samples of hospital based population comprising of rural and urban population of all age groups and both sexes, over a period of one year nine months from January 2015-September 2016 in Rajiv Gandhi Institute of Medical Sciences (RIMS), Srikakulam, Andhra Pradesh, the prevalence of HBsAg was found to be 3.05 %.

The study shows that the positive prevalence was significantly higher in males 440 (60.02 %) compared to that of females 293 (39.97 %). Higher infection in men may be due to their frequent exposure to risk factors such as injecting drug use, having multiple sexual partners or other risk behaviours.

In males, the common age group was found to be 31-50 years wheareas in females it was 21- 40 years.HBV infection being higher in these age groups may be due to their greater exposure & interaction in society as compared to children or elders.

In different studies conducted in a hospital based population of Katuri Medical college, Andhra Pradesh by Samatha et al [12] and in local population of Rajamundry, Andhra Pradesh by Singh J et al[13], the prevalence rate of Hepatitis B surface antigen was found to be 2.42% and 3.3 % respectively. Seroprevalence in tribal areas of Andhra Pradesh was found to be higher when compared to non tribal areas. [15] Also in a recent study on the systemic review and meta analysis of the prevalence of hepatitis B in India by Ashish Batham et al, the state of Andhra Pradesh, showed a prevalence of 3.256 % in nontribal areas and 5.004 % in tribal areas.[16] (Table 5) Seroprevalence of Hepatitis B surface antigen (HBV) in the present study (3.05 %) closely coincides with the prevalence of above studies done in Andhra Pradesh.

Various other studies done in different places of the country in the past 10 years in different study population showed prevalence ranging from 0.3 % to 1.73% in non tribal areas. (Table 2) According to WHO classification, Srikakulam District, Andhra Pradesh falls into Intermediate zone of prevalence as prevalence was between 2-7%.

Conclusion

India has approximately HBV carrier rate of 3.0% with a high prevalence rate in the tribal population. It is important to carry out larger studies to better elucidate the epidemiology of HBV and identify high prevalence areas. The present study helps to know the magnitude of viral transmission in the community & to know the at risk age groups. Seroprevalence of HBsAg in Srikakulam, Andhra Pradesh was found to be in accordance with the national average of 2-7 %.

Most of the India's carrier pool is established by horizontal spread due to crowded living conditions & poor hygiene. Keeping in view, the increasing burden of this disease, there is a need to organize health education campaigns targeting both health care workers as well as public, so that they adopt all possible measures including immunisation to prevent disease transmission and decrease the burden of the disease.

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