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Prevalence of Hepatitis B Surface Antigen in hospital based population in Bijapur, Karnataka

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Abstract: *Background:* Hepatitis B virus (HBV) infection continues to be a serious health problem globally. 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 is strong indicator of true HBV infection rate in the community as large number of patients from different backgrounds attend the hospital. *Objectives:* The study was conducted to know the prevalence of HBV infection in Bijapur, Karnataka. *Methodology:* A one step immunochromatographic method for detection of HBsAg was performed to diagnose HBV infection. 4283 sera samples were tested for HBsAg over a period of one year. *Results:* 1.63% samples were found with HBsAg. Age, gender, month wise and rural: urban distribution was studied. *Conclusion:* Seroprevalence of HBsAg was found less than the national average of 2-7%. This study highlights HBV infection rate in the community in this part of India.

Keywords: HBsAg, prevalence.

Introduction

Hepatitis B Virus (HBV) infection remains a significant health problem globally. HBV causes a spectrum of disease from self limited hepatitis to acute fulminant and chronic hepatitis which may result in sequelae like liver cirrhosis and hepatocellular carcinoma. About 2 billion people (or 30% of world population) worldwide have serological evidence of current or past HBV infection, and an estimated 350 million people harbour chronic infection [1].

Prevalence of HBV infection varies greatly in different parts of the world. The World Health Organization (WHO) has classified HBV prevalence into high endemicity (>8%), intermediate (2-7%) and low endemicity (<2%). HBV prevalence in India is in intermediate range. Every year 100,000 Indians die due to HBV infection related illnesses [2]. Surveys for screening HBsAg have been primary, simple and the most useful mode of determining HBV infection rates. HBV transmission can occur parenterally, sexually or perinatally. Several surveys for HBsAg screening have been carried out at different places involving blood donors and pregnant women. A teaching Hospital patient based study is helpful in assessing true nature of problem in the community. Prevalence studies help in assessing the magnitude of HBV infection and aid in devising preventive measures. Bijapur in northern Karnataka is an underdeveloped district with a large agrarian population. This study was undertaken to estimate the burden of HBV infection in this part of country, compare the prevalence rates in different part of India and to understand the dynamics of transmission.

Material and Methods

The study was carried out at Al Ameen Medical College and Hospital, Bijapur, Karnataka State from January 2010 to December 2010. Subjects included inpatients and outpatients for whom HBsAg detection was sought on the basis of clinical findings, socioeconomic, demographic and risk factors and on certain occasions as part of preoperative evaluation of HBsAg status. Permission was obtained from the Institution Ethics Committee .Blood sample to obtain serum was collected with standard procedure.

A one step rapid immunochromatographic assay (ICA) for the qualitative detection of HBsAg – Instachk TM Hepatitis B manufactured by In Tec Products Inc and marketed by Transasia Biomedical Ltd was employed. The ICA are rapid and sensitive methods for detecting HBsAg and anti-HBs. They are economical and do not require special instrumentation for analysis and have been recommended for routine use in clinical microbiology laboratories [3]. ICA have high sensitivity and specificity [4]. The speed, sensitivity and simplicity of the ICA method make it attractive, particularly for large-scale surveillance studies [4-5].

Results

Sera of 4283 patients were tested for HBsAg over a period of one year from January 2010 to December 2010. 70 patients tested positive with a prevalence of 1.63%. Prevalence was almost between 1-2% throughout the year but in the month of July highest prevalence of 3.83% was registered (Table 1).

Table-1: Prevalence of HBsAg month wise

Month	Number of sera tested	HBsAg Positive sera	Percentage
January	447	6	1.34
February	406	4	0.99
March	312	3	0.96
April	476	9	1.89
May	472	5	1.05
June	499	11	2.20
July	418	16	3.83
August	273	3	1.09
September	271	4	1.48
October	315	3	0.95
November	225	3	1.33
December	169	3	1.78
Total	**4283**	**70**	**1.63**

Table-2: Gender distribution of HBsAg positive patients

Gender	No. of sera tested	HBsAg positive sera	Percentage
Male	2317	43	1.86
Female	1966	27	1.37

Prevalence was higher in males compared to females (1.86versus 1.37) (Table2). Analysis of age distribution of HBsAg revealed a relative high prevalence (2.66%) among 51-60 years age. Almost 2% of patients in second and third decade of life tested positive for HBsAg. Among the rest HBsAg prevalence ranged between 1-1.5% (Table 3). Of 4283 subjects, 2632 were from rural areas and 1651 were from urban area. 49 of the rural patients (1.86%) and 21 urban patients (1.44%) were HBsAg positive

Table-3: Age distribution of HBsAg positive patients

Age	No. of sera tested	HBsAg positive sera	Percentage
0-10	73	01	1.36
11-20	728	13	1.79
21-30	1186	23	1.94
31-40	913	09	0.99
41-50	586	07	1.19
51-60	413	11	2.66
61 & above	384	06	1.56

Discussion

In our study of hospital based population the prevalence of HBsAg was 1.63.This study was conducted over one year and a large number of samples were tested. There are several studies conducted on seroprevalence of HBsAg in India. Batham A et al in their review of 54 studies on HBsAg prevalence in India have reported that prevalence in non tribal population is 2.4%, whereas a very high prevalence was observed among tribal population (15.9%) [6]. Another review of Hepatitis B prevalence in India by Lodha et al has concluded that it is between 1-2 % [7]. High prevalence of HBsAg (between 2-7%) has been reported among pregnant women in India in the past but a recent study from Allahabad North India has found the prevalence of 0.9 % [8]. Smita Sood and Shirish Malvankar have noted 0.87% prevalence in a study of HBsAg prevalence in hospital based population similar to ours. But the relative low prevalence in their study could be due to the fact that it was conducted

in a private hospital catering usually to economically privileged class patients [9]. Bhatta CP et al in a hospital based population study in a Teaching Hospital have reported 2.5% prevalence [10]. In India the HBsAg prevalence among different populations and geographical areas varies greatly and very high prevalence has been noted among the aborigine population of Andaman and in the state of Arunachal Pradesh [1]. We could find two studies of HBsAg prevalence from Karnataka. Srikrishna et al have reported 1.86 prevalence among blood donors of Bangalore [11]. A low prevalence of 0.62% has been reported among blood donors from coastal Karnataka [12]. According to WHO definition one could categorize Karnataka into a HBV low endemic state.

A higher prevalence was seen during the months of June- July. It indicates an increased occurrence of HBV infection during this part of the year. This needs to be further studied and any indicting factors established. Most of the studies have reported higher prevalence among males which is also true in our study. Smita Sood and Shirish Malvankar have reported the prevalence to be 1.04% and 0.58% respectively for males and females [9]. Dutta et al has found it to be 35.3% in males and 19.3% in females [13]. Singh et al have noticed prevalence to be 0.65 and 0.25 % respectively in males and female subjects [12]. It is hypothesised that females probably clear the HBV more efficiently in comparison to males [14]. Relatively higher percentage of subjects in 6^{th}, 3^{rd} and 2^{nd} decade of life respectively were found with HBsAg in their sera. Similar findings have been noted by Smita Sood and Shirish Malvankar (2^{nd}, 5th and elderly patients above 61 years respectively) [9]. A slightly higher prevalence was noticed among rural subjects than their urban counterparts (1.865 versus 1.44%). We hypothesize that this may be due to better awareness of HBV risk factors in the city dwellers. The patients attending our Hospital represent a cross section of Bijapur's populace with mix of poor and rich as well as urban and rural. Therefore our study highlights HBV infection rate in this part of the country and shall provide reference to future studies on the epidemiology of HBV infection.

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