



Original Research Article

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A Retrospective Study on Seroprevalence of Hepatitis B Surface Antigen among Patients in a Tertiary Care Hospital, South India

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ABSTRACT

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Hepatitis B is a parenterally transmitted virus and is major public health problem world wide. A diagnosis of HBV infection usually made by detection of Hepatitis B Surface antigen (HBsAg) in the serum. This retrospective study was conducted to determine the prevalence of Hepatitis B surface antigen among patients in a Tertiary care hospital, Tumkuru, South India during a period from March 2015 – February 2016. A4135 serum samples were screened for testing of HBsAg in the serology section of Department of Microbiology during the study period. Samples were tested for HBsAg by Rapid ICT using commercially available kits. Seroprevalence of HBsAg was found to be 0.58%. This study showed higher prevalence in males (0.74%) compared to females (0.44%). It was also observed that prevalence is highest in (0.97%) age group 41-50 years. In our study prevalence was highest in the month of October and January (1%). In compare to other parts of India, the present study shows low prevalence of hepatitis B infection in Tumkuru, Karnataka, South India. Immunisation with Hepatitis B vaccine helps in reducing the hepatitis B infection.

Introduction

Hepatitis B virus (HBV) causes a spectrum of disease from self limited hepatitis to acute fulminant & chronic hepatitis which may result in sequelae like liver cirrhosis & hepatocellular carcinoma (Quadri *et al.*, 2013). Hepatitis B virus infection (HBV) is a major health problem in many countries of the world especially those in Asia, the Middle East & Africa (El Beltagy *et al.*, 2008). About 2 billion people worldwide have been infected with the virus & about 350 million live with chronic infection (Huda *et al.*, 2013). In the South

East region, the estimated burden of chronic HBV infection is 100 million. HBV is the second most common cause of acute viral hepatitis after HEV in India. Every year, one million Indians are at risk for HBV & about one 100000 die from HBV infection (NCDC Newsletter, 2014).

Transmission of the virus occurs in community in 3 ways. First wave occurs during perinatal period when the virus is transmitted from infected mothers to infants during delivery and up to first year of life.

Second wave of transmission occurs during childhood by horizontal spread through close contact with infected siblings father, relatives and friends. And the third wave of spread occurs during adult life through sexual contact, intravenous drug abuse, blood transfusion etc (Shrestha *et al.*, 2012). Modes of transmission of HBV vary, since the virus is present in blood, saliva, semen, vaginal secretions, menstrual blood, & in smaller quantities in perspiration, breast milk, tears and urine of the infected individuals (Onwuakor *et al.*, 2014). Unscreened donate blood, unsafe therapeutic practices, including the use of inadequately sterilized needles and medical instruments, are the major routes of HBV transmission apart from sexual exposure in South East Asia regions (Negero *et al.*, 2011).

Countries are classified on the basis of endemicity of Hepatitis B Virus (HBV) infection into high (8% or more), intermediate (2-7 %) or low (<2%) incidence countries. The prevalence of chronic HBV infection in India ranges from 2-10% as shown by the different studies. India therefore comes under the intermediate and high endemicity category (Singh *et al.*, 2009). The present study was undertaken to determine the prevalence of Hepatitis B surface antigen in a tertiary care hospital, Tumkur, Karnataka, South India and to compare the prevalence rates in different parts of the world.

Materials and Methods

This retrospective study was conducted at Department of Microbiology of Shridevi Institute of Medical Sciences and Research Hospital, Tumkuru, Karnataka, South India from March 2015 to February 2016. A 5 ml of venous blood samples was collected by venepuncture from all patients who come with laboratory requisition for the testing of

HBsAg. Samples were allowed to clot at RT for about 30 min to 45 min. Serum was separated by centrifugation at a speed of 3000 rpm for 10 minutes All the serum samples were screened for HBsAg by Rapid Immunochromatographic Technique (ICT using the commercially available kit (Diagnostic enterprises) with reported sensitivity of 100% and specificity of 100%. ICT is a rapid and sensitive method for the detection of HBsAg. All serum samples were tested as per the manufacturer's instructions.

Data were analysed with Microsoft excel.

Results and Discussion

A total of 4135 serum samples were received for detection of HBsAg during the period from March 2015 to Feb 2016. Of these, 24 serum samples reactive to HBsAg giving a seroprevalence rate of 0.58% in the study population (Table 1).

Regarding age, seroprevalence of HBsAg was highest 6 (0.97%) in the age group 41-50 years, followed by 4 (0.82%) in the age group of 51-60 years compared to younger age group 11-20 (0.26%) (Table 2).

The prevalence of HBsAg 14 (0.74%) in males and 10 (0.44%) in females (Table3).

Prevalence was almost between 0.2-0.7% throughout the year but in the month of October and January the prevalence rate of HBsAg of 1% was observed (Table4).

Hepatitis B is a parenterally transmitted virus that has adapted for its existence to the basic human activities like close association, sex and child birth (Shrestha *et al.*, 2012). Diagnosis of HBV infection is usually through serological and virological markers. Hepatitis B surface antigen (HBsAg) is the hallmark of HBV infection and is the first

serological marker to appear in acute HBV infection, and persistence of HBsAg for more than six months suggests chronic HBV infection (Onwuakor *et al.*, 2014).

Prevalence of Hepatitis B varies from country to country and depends upon a complex interplay of behavioral, environmental and host factors. In general, it is lowest in countries or area with high standards of living (eg: Australia, North America, North Europe) and highest in countries or areas where social economic level is lower (eg: China, South East Asia, South America). The reported prevalence of carrier in different population varies widely from 0.1% in the advanced countries to 20% in the developing nations. The carrier rate higher in the tropical than in the temperate regions (Behal *et al.*, 2008).

In a retrospective study conducted between 2005 and 2006 in Korea, the prevalence rate

was reported to be 12.7%. In an 11 year surveillance study conducted in Pakistan, prevalence of HBsAg positivity was found to be 2.5% in 47043 patients, whereas it was found to be 8.1% in 2995 subjects from Dhaka, Bangladesh.

Prevalence of HBV was found to be 11.2% in Andean plateau region of Latin America, which is considered as low risk region (Turanoglu *et al.*, 2013). In a study conducted in a hospital based population at Kathmandu Medical College Hospital, Nepal, the prevalence rate of viral Hepatitis B was found to be 2.5% (Sood *et al.*, 2010). Prevalence of HBV was found to be 11.2% in Andean plateau region of Latin America, which is considered as low risk region (Turanoglu *et al.*, 2013). In a study conducted in a hospital based population at Kathmandu Medical College Hospital, Nepal, the prevalence rate of viral Hepatitis B was found to be 2.5% (Sood *et al.*, 2010).

Table.1 Prevalence of Hepatitis B surface Antigen (HBsAg) among Patients in a Tertiary Care Hospital

Test	Total No. of Samples Received	No. of HBsAg Positive Samples	% of Positive Samples
HBsAg	4135	24	0.58

Table.2 Drug sensitivity profile of *E.coli* isolates against commonly used antibiotics Prevalence of Hepatitis B surface Antigen (HBsAg) in Different Age Group in a Tertiary Care Hospital

Age Group (in Years)	Total No. of Samples Received	No. of HBsAg Positive Samples	% of Positive Samples
1-10	163	0	0
11-20	383	1	0.26
21-30	1243	5	0.40
31-40	704	4	0.56
41-50	616	6	0.97
51-60	486	4	0.82
>60	540	4	0.74
Total	4135	24	

Table.3 Prevalence of Hepatitis B Surface Antigen (HBsAg) in Relation to Gender of Patients in a Tertiary Care Hospital

Gender	Total No. of Samples Received	No. of HBsAg Positive Samples	% of Positive Samples
Male	1873	14	0.74
Female	2262	10	0.44
Total	4135	24	

Table.4 Prevalence of Hepatitis B Surface Antigen (HBsAg) in Relation to Month wise Among Patients in a Tertiary Care Hospital

Month	Total No. of Samples Received	No. of HBsAg Positive Samples	% of Positive Samples
March 2015	276	02	0.72
April 2015	359	01	0.27
May 2015	335	02	0.59
June 2015	377	02	0.53
July 2015	387	03	0.77
August 2015	383	00	0.00
September 2015	413	02	0.48
October 2015	369	04	1.08
November 2015	369	02	0.54
December 2015	259	02	0.77
January 2016	245	03	1.22
February 2016	363	01	0.27
Total	4135	24	

Present study revealed increasing trend of seroprevalence with advancing age. HBsAg positivity was significant in the age group 41-50 yrs and > 50 years compared to younger age group (<20yrs). The significant association of HBV markers with older ages could be due to the greater number of years of potential exposure, a lack of adult HB vaccination programs, and the lack of awareness of HBV infection in earlier decade (El Beltagy *et al.*, 2008).

Many studies reported that seroprevalence of HBV infection higher in male patients than in females. In our study the seroprevalence of HBV infection was more in male patients (0.7%) than in female patients (0.4%). No plausible explanation

has been given for the higher prevalence in male in the general population but probably females clear the HBV more efficiently as compared to males (Chakraborty *et al.*, 2014).

A study conducted by Qadiri *et al.*, reported that higher prevalence in June-July (Qadri *et al.*, 2013). Higher prevalence was observed in the month of October and January in the present study.

Still further studies are needed to evaluate prevalence of HBsAg in relation to different season.

According to the WHO classification, this part of Karnataka qualifies as a low

prevalence area (< 2%) of hepatitis B infection. An ideal way to reduce the Hepatitis B infection is to implementation of immunization programs along with health education. This is not a community based study. Further, community based studies are required to better estimate the magnitude of hepatitis B infection

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