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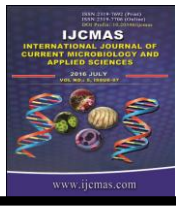

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Prevalence of Hepatitis B Surface Antigen (HBsAg) Positivity among General Population in Yavatmal (Maharashtra), India

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A B S T R A C T

Hepatitis B is one of the major transfusion transmitted infections. It forms a serious health problem globally. Hepatitis B virus (HBV) infection is significant health problem, as it can lead to chronic hepatitis, liver cirrhosis, and hepatic carcinoma. Prevalence of Hepatitis B infection varies across the different geographical areas. Aim of this study was to determine the trend in Hepatitis-B virus infection in general population and to compare the prevalence with that of healthy blood donors. We collected 1 ml of blood samples with all aseptic precautions and tested by HEPALISA. Seroprevalence of HBsAg positive was 1.57% while in healthy donors it was 0.87 % and in this study majority of sero-positive donors were younger than 40 years. To reduce the prevalence of hepatitis, public awareness, educational and motivational programs, mass immunization programs and Pre-donation counseling help in decreasing the infection.

Introduction

Hepatitis-B virus infection is a life threatening disease and contributes to a large man power as well as economical loss worldwide. It is a serious and common infectious diseases of the liver affecting millions of people worldwide (Meshram *et al*., 2015). It is caused by hepatitis-B virus which can be transmitted through percutaneous i.e. puncture through the skin and mucosal route i.e. direct contact with mucosal membrane, exposure to infectious blood or blood products, through body fluids. Vertical transmission (from mother to child) of the virus, unsafe sexual intercourse are also important routes for the transmission of the disease (Mohd Akmal *et al*., 2015).

Hepatitis B virus infection can causes the acute as well as chronic infection. Acute hepatitis implies a condition lasting less than 6 months, culminating either in complete resolution of the liver damage with return to normal liver functions and structure or a rapid progression of the acute injury towards extensive necrosis and a fatal outcome. Chronic hepatitis is defined as sustained inflammatory process in the liver lasting

longer than 6 months. It can progress towards the cirrhosis of the liver, hapatocellular carcinoma, liver failure & death. Hepatitis B is 10th leading cause of the death in the world (Chen *et al*., 2010).

Approximately 30% of the worlds population or about 2 billion persons have serological evidence of either current or past infection with hepatitis B virus (Prevention of hepatitis B, 2002). A 350-400 millions are chronic carriers and 10 millions of new cases occur annually. Hepatitis B virus infection is estimated to be the cause of 30% cirrhosis and 53% of the liver cancer in the world. Approximately 15-40% of patients with chronic HBV will develop cirrhosis and end stage liver failure or hepatocellular carcinoma in their life time (Chowdhury *et al*., 2015; Elizabeth *et al*., 2011; Chowdhury *et al*., 2001).

However the significance and magnitude of the problem vary from country to country. As per WHO guidelines, Countries are classified on the basis of endemicity of hepatitis-B virus (HBV) infection into high (8% or more), intermediate (2-7%), or low (less than 2%) incidence countries. The prevalence of chronic HBV infection in India ranges from 2% to 10% as shown in different studies. India therefore comes under the intermediate to high endemicity category (Who's Certified, 2002).

The study aimed to determine the trend in Hepatitis-B virus infection in general population and to compare the prevalence with that of healthy blood donors.

Materials and Methods

This study carried out in department Microbiology Shri Vasantrao Naik Govt Medical College, Yavatmal. This study was conducted from July 2015 to December 2015. We collected 1 ml of blood samples with all aseptic precautions and tested by HEPALISA (manufactured by J.Mitra & Co Pvt.LTD New Delhi). Simultaneously, we screened the blood donors in the same period for HBsAg. This study was done in healthy donors (18-45 years) attending the blood blank.

Results and Discussions

A total of 4649 OPD patients were screened for HBsAg, of that 1268 were male while 3381 were female. And seroprevalence of HbsAg positive was 1.57%.

Table 1 shows that, out of 1268 male patients 28 were positive (2.2%) and maximum positivity was seen in age group of 30-39 years (10/28). Out of 3381 female patients 45 were positive (1.33%) and maximum positivity was seen in age group of 20-29 years (19/45).

Table no 2 shows that, out of the total 5749 blood donors, 5386 were males and 363 were females. None of the females donors were HBsAg positive, while 50 males were HBsAg positive. Maximum HBsAg positive male donors were in the age group of 26-35yrs.The prevalence of HBsAg positive was 0.87% in healthy blood donors.

A large number of studies on the epidemiology of HBV infection have been carried out in this country over the last two decades. There is a wide variation in the prevalence in different regions of the country. These include the sample size, the methodology for assay of HBV serological markers, the age group covered, general population sample versus blood donor and risk population samples, ethinicity and geography of the study population. All these factors have also been shown to influence the prevalence of HBV infection globally.

Table.1 Age & Sex wise distribution of clinical OPD patients testing for HBsAg

Age of patients(years)	Males		Females		Total	
	Number	Positive	Number	Positive	Number	Positive
0-19	125	00	448	00	573	00
20-29	354	08	1258	19	1612	27
30-39	244	10	1075	12	1319	22
40-40	204	06	112	07	316	13
50-59	175	04	246	05	421	09
60-69	122	00	186	02	308	02
>/=70	38	00	56	00	94	00
Total	1268	28	3381	45	4649	73

Table.2 Age and sex wise distribution of HBsAg positive blood donors in blood bank

Age of donars (years)	Males		Females		Total	
	Number	Positive	Number	Positive	Number	Positive
18-25	1748	14	128	0	1876	14
26-35	1958	24	142	0	2100	24
36-45	1152	09	75	0	1227	09
>45	528	03	28	0	556	03
Total	5386	50	363	0	5749	50

In present study the seroprevalence of HbsAg positive in rural population of Yavatmal region was 1.57%. In Maharashtra prevalence of HBsAg was 2.15%. While, in a population based study of rural population in Birbhum district of West Bengal, with a population of 7653 of all ages and both sexes showed that, prevalence of HBsAg was 2.97%. In costal Karntaka study shows overall seroprevalence of HBsAg was observed to be 0.62% (Karandeep Singh *et al*., 2009). And the population based meta analysis study by Mohmad *et al* shows that overall carrier rate is often 4.7%. Like our study, in most of the studies maximum seropositivity was seen after second decade of life because of sexually active age group.

In our study seroprevalence of HBsAg was o.87% in blood donors. While study done by Rupali *et al* in Nagpur region seroprevalence of HBsAg was 0.79% in blood donors.

When the results of this study was compared with those reported from similar blood donors of other countries like Cameroon 11.72% (Zekeng *et al*., 1990), Taiwan 4.5% (Tsai *et al*., 1991), Ethiopia 14.4% (Rahlenbeck *et al*., 1997), Mauritania 20.3% (Lo *et al*., 1999), Thailand 4.51% (Luksamijarulkul *et al*., 2002), Djibouti 10.4% **(**Dray *et al*., 2005**),** Mangolia 8.2% (Tsatsralt-Od *et al*., 2005), this study showed relatively lower prevalence of the hepatitis-B surface antigen whereas countries like US Community 0.15% (Kim *et al*., 2004), showed lower HBsAg positivity in comparison to the present study.

According to India's Drug and Cosmetics Act (1945), each blood unit has to be tested for hepatitis virus infection (Drugs and Cosmetics Act, 1940). The decreasing trend in seroprevalence was noticed over three

successive years. This may be due to awareness of the disease and modes of prevention may be one reason for the low prevalence declining trends in HBV infection. Secondly, the implementation of strict predonation counseling and donors selection help in decreasing the infection.

In conclusion, although India lies in intermediate to high endemic category, the prevalence of hepatitis B virus infection is low in Yavatmal region. It is likely that an effective childhood immunization programme will reduce the burden of infection in our country. Simultaneously focus on improving public health measures to prevent disease transmission and decrease the burden of the disease. To reduce the prevalence of transfusion transmitted Hepatitis B, a comprehensive screening of blood donors with recommended methods, strict donor selection criteria, better education of donors and improved prophylactic measures at public level should be implemented to ensure the safe blood donation.

In addition, epidemiologic studies like the present one from different states of India would be helpful to estimate real statistics of hepatitis-B infection in India.

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