

Prevalence of Hepatitis B Among the Voluntary Blood Donors At The Department Of Immunohaematology & Blood Transfusion Of MGM Hospital, Kamothe, Navi Mumbai.

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Short Running Title:

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Abstract

Hepatitis B is one of the major transfusion transmitted infections. It forms a serious health problem globally. Prevalence of Hepatitis B infection varies across the different geographical areas. Aim and objectives of this study were to know the sero-prevalence of Hepatitis B infection in voluntary blood donors at the Department of Immunohaematology & Blood Transfusion of MGM Kamothe Hospital. This is a retrospective study of the last three years from January 2012 to December 2014. All the blood units collected were screened for the Hepatitis B, HCV, HIV I & II, Syphilis and Malaria. ELISA was done to detect the Hepatitis B surface antigen in all the blood donors as a marker of infection. High sero-prevalence rate was observed among the male donors (1.12%) than in female blood donors (0.01%). Age-wise sero-prevalence was found to be more in 31 -40 years of age group (0.54%) and in this study majority of sero-positive donors were younger than 40 years. To reduce the prevalence of the post-transfusion hepatitis, stringent donor screening procedure, 100% voluntary blood donations are more effective, in addition to, better awareness among donors and re-intensification of prophylactic programs at public level to ensure the safe blood donation.

Key Words: Hepatitis B, blood donors, sero-prevalence, HBsAg, donor screening.

I. INTRODUCTION

Hepatitis B virus (HBV) infection is a global health problem. Approximately 30% of the world's population or about 2 billion persons have serological evidence of either current or past infection with hepatitis B virus [1]. HBV causes a spectrum of disease from self limited hepatitis to acute fulminant and chronic hepatitis which may result in sequel like liver cirrhosis and hepatocellular carcinoma [2].

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 by different studies. India therefore comes under the intermediate to high endemicity category [3]. This infection is transmitted mainly through blood and blood products; vertically from mother to neonates and body secretions [4].

Blood transfusion associated hepatitis B viral infection continues to be a major problem in India even after adoption of mandatory screening of hepatitis B surface antigen (HBsAg) by enzyme-linked immuno-sorbent assay (ELISA) [5]. The disease is caused by an enveloped, partial ssDNA virus [6-8]. Hepatitis B virus infects the liver. The liver functions are impaired while the virus replicates in the hepatocytes [9, 10]. Hepatitis and liver damage arise as a consequence of the immune response to the virus in the liver cells [11].

Hepatitis B virus is present in the blood, blood products and body fluids such as vaginal secretions, and in low concentrations in the saliva of active carriers [12]. The average incubation period of the virus is 90 days from the time of exposure to onset of symptoms, but may vary from 6 weeks to 6 months [13, 14]. This study aims to determine the trends in Hepatitis B infection and compare its prevalence among blood donors with other parts of India.

II. MATERIALS AND METHODS:

The study was conducted over a period of three years from January 2012 to December 2014 at MGM Kamothe Blood Bank in the Department of Immunohaematology & Blood Transfusion. Blood donors were voluntary or either replacement donors. Donors were

screened by the standard criteria for donor fitness. They were carefully selected for donation by the trained personnel after medical examination and target questionnaire.

INCLUSION CRITERIA:

Clinically healthy individuals between 18-65 years of age, with body weight of above 45Kgs, Haemoglobin more than 12.5gm/dl and no significant medical or surgical history were qualified for the donation process.

EXCLUSION CRITERIA

Persons belonging to high risk groups such as patients from thalassemia clinic, sexually transmitted disease clinics, professional blood donors, drug abuser, dialysis patient, pregnant women were excluded from the donation process.

Sera of all qualified blood donors were screened for the Hepatitis B (HBsAg), Hepatitis C (HCV), Human Immunodeficiency Virus (HIV – 1 & 2), Syphilis (VDRL) and Malaria. Screening for HBsAg in all the serum samples collected were performed using the commercial kit based on microbial ELISA (Hepalisa – J Mitra & Co, New Delhi) as per the manufacturer's instructions. Data of HBsAg alone was analyzed with Chi-square test and results were considered significant if $p < 0.05$

III. RESULT

Out of total 9708 blood donors, 9021 (92.92%) were males and 687 (7.07%) were females with male to female ratio being 13.13:1 (Table No. 1). The overall positive HBsAg prevalence in the present study was 1.13% (Table No. 2).

Higher positive prevalence rate was observed among the male donors (1.12%) than in female (0.01%) blood donors (Table No.2). Age-wise positive prevalence was found to be more in 31-40 years age group (0.54%) and majority of HBsAg positive donors were below 40 years (Table No. 3).

IV. DISCUSSION:

According to India’s Drugs & Cosmetics Act ^[15], each blood unit has to be tested for the Hepatitis B viral infection. In our study total 9708 blood donor were tested and overall sero-prevalence of HBsAg was observed to be 1.13% (110). Our results are similar to the result observed in previous studies done by Bhattacharya et all (1.66%) in 2006^[16], Manzoor et all (1.70%) in 2009^[17] and Arora et all (1.70%) in 2010 ^[18].The findings of some of the studies from Maharashtra region conducted by Patil et all (2.99%) in 2011 ^[18], Mudholkar et all (2.90%) in 2014^[19] and Sonwane et all (2.78%) in 2003^[20]found the sero-prevalence to be greater than our study. Lack of awareness and carrier state seems to be the reason for this higher sero-prevalence. The study done by the Chatteraj et all (0.99%) in 2008 ^[21] and Singh et all (0.62%) in 2009 ^[22] reported the sero-prevalence rate lower than present study due to high literacy rate, awareness about the disease and mode of prevention, implementation of strict pre-donation counseling and donor selection criteria.

In our study the sero-prevalence of HBsAg was significantly high in male donors (1.12%) as compared to female donors (0.01%) which is similar to that found in study done by Chandshekrant all in 2000 at Madurai ^[23]. In our study majority of the sero-positive donors were younger than 40 years and the highest sero-prevalence rate is

observed in the age group of 31-40 years which is comparable with study done by Baba et all in 2000 ^[24], Tessema et all in 2008 ^[25], and Quadri et all in 2013 ^[26]. The high sero-prevalence in youth in our study demonstrates the need of further re-intensification of preventive programmers that aim at high risk behavior change as this is the most productive and economically viable group of population. Ensuring the safety of the patient by reducing the residual risk of transfusion transmitted hepatitis is the concern of every transfusion centre. Public awareness programs, educational and motivational programs, mass immunization programs, ensuring 100% voluntary blood donation, implementation of strict pre-donation counseling and donor selection criteria will be effective in decreasing the hepatitis B infection rate.

V. CONCLUSION:

This study has determined the sero-prevalence of Hepatitis B infection to be 1.13% among the blood donors at MGM Kamothe, Blood Bank. 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.

TABLE NO. 1: GENDER DISTRIBUTION AMONG BLOOD DONORS

YEAR	TOTAL DONOR	MALE DONORS		FEMALE DONORS	
		NUMBER	PERCENTAGE(%)	NUMBER	PERCENTAGE(%)
2012	2565	2381	92.82	184	7.1
2013	3132	3055	97.5	77	2.4
2014	4011	3585	89.37	426	10.6
TOTAL	9708	9021	92.92	687	7.07

TABLE NO. 2: GENDER DISTRIBUTION OF HBsAg POSITIVITY IN BLOOD DONORS

YEAR	TOTAL DONORS	MALE DONORS		FEMALE DONORS		TOTAL HbsAg POSITIVE DONORS	
		NUMBER	PERCENTAGE (%)	NUMBER	PERCENTAGE (%)	NUMBER	NUMBER
2012	2565	32	1.24	01	0.03	33	1.28
2013	3132	54	1.72	00	0	54	1.72
2014	4011	23	0.57	00	0	23	0.57
TOTAL	9708	109	1.12	01	0.01	110	1.13

TABLE NO. 3: AGE DISTRIBUTION OF HBsAg POSITIVITY IN BLOOD DONORS

YEAR AGE GROUP	2012		2013		2014	
	M	F	M	F	M	F
18-20 yrs	01	00	01	00	01	00
21-30 yrs	13	01	20	00	09	00
31-40yrs	14	00	30	00	09	00
41-50yrs	03	00	02	00	03	00
>50yrs	01	00	01	00	01	00
TOTAL	32	01	54	00	23	00

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