PREVALENCE OF HEPATITIS B CARRIERS AND BLOOD GROUP FREQUENCY IN VOLUNTARY BLOOD DONORS

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Infection with Hepatitis B virus is a serious hazard. A study was carried out to evaluate the prevalence rate of HBsAg carrier state among a group of 200 healthy voluntary blood donors. Blood groups and haemoglobin levels were also determined. The prevalence rate for HbsAg carrier suite was 2% (males-1.09%, females-11.11%). The frequency distribution of ABO blood groups was: A- 22.7%, B- 36.35%, O- 33.85%>, and AB- 7.10%. The percentage distribution of Rh antigen was: Rh+ve- 93.44% and Rh-ve- 6.56%. Haemoglobin level, mean value ±standard deviation, for males was 13.84 ±0.95 and in case of females it was 13.02±0.53. The study reveals that females exhibit greater seropositivity, group B is the commonest and males have significantly higher Hb levels. In order to estimate HBV, blood and all blood products must be tested for HbsAg. Moreover, Hepatitis B vaccine should be included in the Expanded Programme of Immunization in our country.

KEYWORDS: **Hepatitis B, HbsAg, Blood groups, ABO, Rh(D), Haemoglobin**

INTRODUCTION

Viral hepatitis is a global public health problem. Hepatitis B vims infection is endemic in the developing countries[1,2]. this may result in a number of conditions ranging from asymptomatic carrier to fulminant hepatitis with liver failure[3].

In 1965, Blumberg and his associates discovered Hepatitis B surface antigen (HbsAg) in the serum of an Australian patient suffering from haemophilia, who had repeated blood transfusions [4]. HbsAg is the earliest marker of acute Hepatitis B (HBV) vims infection, but could be present in chronic hepatitis as well as in chronic carrier state[5].

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Patients who remain infected with Hepatitis B vims for more than 6 months are termed as chronic carriers. The infectivity status of HbsAg carriers is important in die transmission of infection [6]. Persistent antigenaemia not only leads to further transmission of Hepatitis B, but also confers a risk for development of chronic liver disease and hepatocellular carcinoma as a late complication [7].

Hepatitis B has been a hazard of exposure to infected blood or blood products. This is evident from high rate of infection in certain occupational groups such as health care workers [8,9]. The Hepatitis B virus spread through close personal contacts. HBV has been detected in saliva, urine, semen and vaginal secretions[10].

Human blood group systems have immense importance in medicine, genetics, medical jurisprudence and anthropology. Blood group data of a population is an important guide for blood banks on types of blood to be stored for transfusion services [12]. Haemoglobin (Hb) estimation is essential for avoidance of any deleterious effects on the donors and recipients. Women of child bearing age and children may also suffer from nutritional anaemia which is one of the major public health problems in Pakistan. About 65% children were found to be anaemic [13].

Present study was designed to evaluate the prevalence rate of HbsAg carrier state among a group of healthy voluntary blood donors. Blood groups and haemoglobin levels in these donors were also determined

MATERIALS AND METHODS

In this study 200 healthy voluntary blood donors of either sex from Blood Transfusion Centre, Mayo Hospital and Punjab Institute of Blood Transfusion, Lawrence Road, Lahore, were included. The clinical details of these subjects were recorded on a proforma. The blood sample was collected by venipuncture using sterile disposable syringe.

Fresh serum samples were tested for the presence of Hepatitis B surface antigen by reverse passive Haemagglutination Test using commercially available kit (SERODIA-HBs, Japan). The test is based on the principle that sensitized red blood cells consisting of fixed chicken erythrocytes with adsorbed highly purified guinea pig anti HBs-immunoglobulin (IgG) are agglutinated specifically in the presence of HBs antigen in the serum or plasma. The procedure was strictly followed as given in the kit. Negative and positive controls were run with each batch of samples.

The ABO and RH(D) grouping was checked by slide method. Strong anti A, anti B and anti D sera (Trans Clone, SANOFI DIAGNOSTIC PASTEUR) having specific antibodies were used and the results were read within 3 minutes for agglutination. Haemoglobin level was determined by acid haematin method using Sahli's Haemoglobinometer.

Fischer's Exact Test and two sample Z test were used for data analysis. For the tests, p value less than 0.05 ($p < 0.05$) was considered statistically significant*.

RESULTS

A group of 200 healthy voluntary blood donors comprising 182 males and 18 females were tested for HbsAg. The prevalence rate for HbsAg carrier state was 2.0%. Two males (1.09%) and two females (11.11%) were HbsAg positive as shown in Table-1. The difference of disease prevalence between males and females was statistically significant (p value <0.05) *.

Table-1: Sex Distribution of HbsAg

SUBJECTS	HEPATITIS B SURFACE ANTIGEN	
	POSITIVE	**NEGATIVE**
MALE (N= 182)	02	180
FEMALE	02	16

Significance level is p<0.05*

Our study revealed that 50% of the HbsAg positive cases had a history of jaundice, whereas only 1.5% of HbsAg study population had the same history.

The frequency distribution of ABO blood groups phenotype is given in Fig.-l. It shows that group B (36.35%) is the commonest followed by group O (33.85%), group A (22.7%) and group AB (7.10%). no statistically significant difference was observed in males and females in distribution of Rh blood groups.

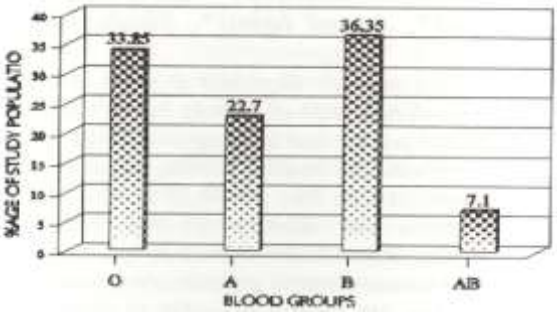

FIG. -1: ABO BLOOD GROUP PHENOTYPE FREQUENCY

The percentage distribution of Rh antigen shows that 93.44% of the subjects are Rh-l-ve and 6.56% are Rh-ve (Fig.-2).

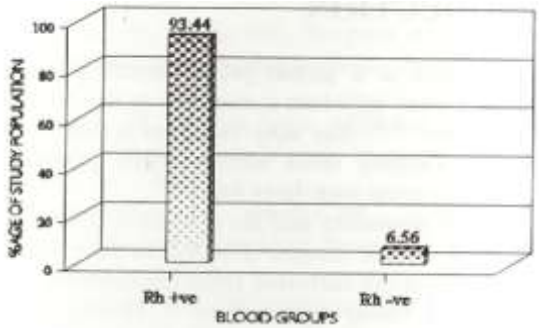

FIG. -2: Rh(D) BLOOD GROUP FREQUENCY

The Haemoglobin level of the subjects as given in Table-2 shows mean Hb + SD as (13.84+0.95) for males and (13.02+0.53) in case of females. A statistically significant difference was observed between male and female haemoglobin levels*.

TABLE-2: SEX DISTRIBUTION OF HAEMOGLOBIN LEVEL

SUBJECTS	HAEMOGLOBIN (GMS/DL +SD)
MALE (N = 180)	13.833 + 0.95
FEMALE (N = 18)	13.02 + 0.53

Significance level is p<0.05*

DISCUSSION

Viral hepatitis is a major health problem in all parts of the world. In underdeveloped countries. Hepatitis B viral

infection is more prevalent as compared to that in the developed countries. It depends upon environmental. behavioral and host factors [2].

Hepatitis B viral infection may cause acute hepatitis, chronic hepatitis or a chronic carrier state '. There are almost 3(H) million carriers in the world. These constitute a major reservoir for the spread of the infection [l4].

In the present study, 2% of the subjects revealed the carrier state for HbsAg. The prevalence rate of HbsAg carriers is under 1 % in developed countries and only 0.2% in voluntary blood donors in the USA [u\ whereas in Africa and South East Asia, it is more than 20%. Results of this study are comparable to the results of a study conducted on voluntary blood donors in Lahore [16].

Different studies showed that in Pakistan, the carrier rate was higher in health care workers due to exposure to infected blood or blood products[8,9]. HbsAg positive subjects having no history of jaundice constitute a reservoir of infection and can spread the disease through contact, blood transfusion, tattooing and vectors like mosquitoes. This can lead to liver cirrhosis and hepatocellular carcinoma in late stages.

The results of this study show that females are more seropositive for HbsAg (chronic carrier state) than males in contrast to the results reported in studies conducted in USA and Pakistan[10,17]. This might be due to a difference in the risk factors. Male homosexuality being more common in USA, but heterosexual contact is a major factor in our country. This difference might also be due to a lack of primary health care facilities in Pakistan making our women more susceptible to infection. One of the important hazard of female carriers is perinatal transmission of infection to infants during birth. This is a common mode of transmission of infection in Asia [18,19.]

Identification of blood groups is essential for blood transfusion. The frequency of ABO and Rhesus blood groups in our study is comparable to the frequency reported in a study conducted in Karachi[12] whereas a study conducted in Lahore shows that group 0 has the highest frequency [11]. the difference in the frequency might be due to different sample size.

The haemoglobin level within normal range of the reference value for age and sex is important for a blood donor. The results of haemoglobin levels in this study are in agreement to the normal values for healthy males and females as recommended by WHO study group and by Dacie and Lewis [20,21]. Males had higher Hb level as compared to females.

Hepatitis B virus causes a lot of morbidity and mortality in Pakistan. Prevention is the only way to control the disease by avoiding risk factors and observing all the necessary' precautions while handling the infected blood and body fluids.

Presently the mandatory testing for HbsAg along with blood grouping is only available in the blood transfusion centres of big cities. This facility should be extended to the peripheral rural areas as lack of testing contributes to uninhibited transmission of HBV infection.

It is imperative that we should test blood and all blood products for HbsAg to eliminate HBV. Hepatitis B vaccine is safe, effective and well tolerated [22]. As recommended by WHO, Hepatitis B vaccine should be included in the Expanded Programme of Immunization (EP1) in our country [23].

In conclusion, this study projects that (a) the prevalence of Hepatitis B is 2% with females exhibiting greater seropositivity; (b) group B is the commonest; and (c) males have significantly higher Hb levels.

CONCLUSIONS

This study projects that:

0. The prevalence rate of HbsAg is 2% with females exhibiting greater seropositivity (11.11%).
1. Group B is the commonest.
2. The percentage distribution of Rh(D) antigen shows that 93.44% of the subjects are Rh+ve and 6.56% are Rh-ve.
3. Haemoglobin level, mean value ± standard deviation, for males (13.84+0.95) is significantly higher than females (13.02+0.53) *.

ACKNOWLEDGEMENTS

We are thankful to Prof Dr Aqueela Tariq Bhutta, Director Blood Transfusion Services Punjab, Lahore, Dr Zulfiqar Hussain, Incharge Blood Transfusion Officer. Emergency Department. Mayo Hospital, Lahore and students of Diploma in Blood Transfusion for purchase of kits and cooperation in sample collection.

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