

Distribution of Blood Groups Among Carriers of HBsAg

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ABSTRACT A total of 250 HBsAg Carriers and 250 controls was screened for ABO, Rh (D) MN blood groups. There was preponderance of B blood group (38.4%) and Rh (D) positives (96.8%) in carriers compared with controls. In the MN system the M (48.4%) and MN (19.2%) blood groups were found significantly higher among HBsAg carriers.

INTRODUCTION

During the last few decades it has been well established that persons possessing different blood groups may differ in their susceptibility to certain diseases (Mourant et al., 1978). A number of chronic diseases show significant associations with ABO blood groups and may play an important role in selection (Cavalli-Sforza and Bodmer, 1971).

A study by Zuckerman and McDonald (1963) showed that the frequency of HBsAg was higher in males than in females and the carriers of the antigen showed an excess of blood group A and a deficiency of O blood group. In the present study an attempt was made to find out the association between blood groups and carriers of HBsAg.

MATERIALS AND METHODS

Blood samples from 250 blood donors who were carriers and 250 controls were collected from the Indian Red Cross Society and Lok Nayak Jai Prakash Naryan Hospital blood banks of Delhi. Standard ELISA (Ranbaxy) was followed for screening the blood samples for the presence or absence of HBsAg.

ASSAY PROCEDURE

Commercially available (Ranbaxy) anti-HBs coated ELISA plates were used for the detection of HBsAg.

The sera under the test, negative control and positive control were dispensed at 100 µl/well and the plates were incubated at 37°C for thirty minutes. After five washes with PBT anti sheep IgG conjugated to peroxidase was added at 1:50 dilutions and incubated at 37°C for thirty minutes. Following the five washes with PBT colour was developed by reaction with tetramethylbenzidine with 0.005% H₂O₂ in citrate buffer and kept for thirty minutes at room temperature. Plates were blocked with blocking reagent for thirty minutes. The colour was produced by the positive control and the samples reactive or positive for HBsAg. The negative control and the samples negative for HBsAg remained colourless.

The blood grouping was done by following the procedures described by Bhatia (1972) and Simmons (1980).

RESULTS

Distribution of ABO blood groups among carriers of HBsAg and controls showed the preponderance of blood group B among carriers, following by O (31.6 per cent), A (20.4 per cent) and AB (9.6 per cent). Similar findings were observed among controls (Table 1), and there was no difference between carriers and controls with respect to the ABO distribution.

The distribution of the Rh blood groups among carriers of HBsAg and controls showed

that the frequency of Rh+ves was 96.8 per cent among carriers and 96.4 per cent in controls (Table 1). This difference was found to be statistically nonsignificant.

Distribution of the MN blood groups among carriers of HBsAg and controls showed that the frequency of the M blood group in carriers was higher (48.4 per cent) than in controls (36.4 per cent). The N blood group incidence was 32.4 per cent and 54 per cent, respectively, and MN blood group incidence was 19.2 per cent and 9.6 per cent, respectively in carriers and in controls. These differences were found to be statistically significant.

DISCUSSION

The distribution of the ABO blood group system did not show any significant difference between carriers and controls, but the frequencies of the A and O blood groups were higher in carriers than in controls (Table 1). These observations are in agreement with some previous studies (Hersh et al., 1971; Hadziyannis et al., 1973) stating that there are no significant differences with respect to the distribution of ABO blood groups in HBsAg positive cases and controls. However, conflicting results have been reported on the relationship between viral hepatitis and ABO blood groups (Lewkonia and Finn, 1969; Zuckerman and McDonald, 1963). Several studies on the association of the ABO blood groups with diseases have been carried out earlier including infectious conditions like smallpox, pulmonary tuberculosis, leprosy and syphilis (Giblett, 1969; Mourant et al., 1978). In a majority of infectious disorders, the associations concerned blood groups O and A (Murthy and Padma, 1982). Similar findings suggested that persons of O blood group showed an increased susceptibility to acute infectious hepatitis (Lewkonia and Finn, 1969; Zuckerman and McDonald, 1963). Padma and Vasantha (1988) determined significantly increased O blood group incidence in serum hepatitis

Table 1: Distribution of the ABO, Rh and MN blood groups among carriers of HBsAg and controls

Blood groups	Carriers		Controls	
	No.	%	No.	%
<i>ABO</i>				
O	79	31.6	77	30.8
A	51	20.4	44	17.6
B	96	38.4	112	44.8
AB	24	9.6	17	6.8
<i>Rh</i>				
Rh+	242	96.8	241	96.4
Rh-	8	3.2	9	3.6
<i>MN</i>				
M	121	48.4	91	36.4
MN	48	19.2	24	9.6
N	81	32.4	135	54.0

ABO - $\chi^2 = 2.964$; d. f.=3; (p>0.5)

Rh - $\chi^2 = 2.13$; d. f.=1; (p>0.05)

MN - $\chi^2 = 12.87$; d. f.=2; (p<0.05)

while group B showed a decreased risk with it.

No significant association was found between carriers and controls with respect to the distribution of Rh (D) blood groups in this study and similar results were reported in a previous study by Hadziyannis et al. (1973). It is suggested that factors closely associated with Rh blood group do not appear to be of importance for the genesis of the HBsAg carrier state.

A significant difference was observed with respect to the MN blood groups in carriers and controls; higher frequencies of M and MN blood groups were found in carriers than in controls. This indicates that blood groups M and MN may have an increased risk of HBsAg infections.

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