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ABO and Rh Blood Groups in Hypertensive Patients: A Cross Sectional Study from Rural Tertiary Care Hospital of South Karnataka, India

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Abstract: Hypertension is the major risk factor for cardiovascular disease. Genetic factors are one of the non-modifiable risk factors. The ABO blood group is one such genetic factor that can give valuable information for early detection of risk population. The objective of our study was to assess the relationship between blood group and hypertension in 200 hypertensive patients. Study protocol included detailed clinical history, examination and investigations. Blood groups were determined using the slide haemagglutination technique. It was found that in hypertensive patients blood group B was predominant group along with Rh positivity. A more extensive population based case control study in future is needed to know the link between blood groups and hypertension.
Keywords: ABO blood group, Hypertension, Rh blood group.

INTRODUCTION

Many studies have showed evidence for genetic influence on blood pressure control system [1-3]. Platt *et al*. concluded that hypertension is a mendelian dominant inherited disease [1]. Previous studies have shown that various blood group phenotypes have been implicated in increased risk of developing hypertension [4-8]Some studies concluded that there was no association between development of hypertension and a particular blood group[9,10]. Even though the blood group is a non-modifiable risk, having knowledge of association between hypertension and blood group can help to make healthy life styles. These healthy life styles can be implemented in early life of at risk individuals as a preventive measure before the development of hypertension.

Although hypertension is very common in south India, studies on blood groups in hypertensive patients from rural Indian areas are lacking. Therefore, the aim of this study was to find out the association between ABO and Rh blood groups with hypertension.

MATERIALS AND METHODS

Consecutive 200 adult hypertensive patients admitted in the medicine department of territory care hospital were considered for this descriptive observational study. Ethics committee approval was taken for the study. The written and informed consent of the patients was obtained.

Following patients were excluded from study

- Patients with aortic aneurysm
- Patients with renal disease
- Patients with connective tissue disorder
- Patients with diabetes mellitus

Study protocol included detailed clinical history, clinical examination. Those with blood pressure > 140 / 90 mmHg taken twice or those on antihypertensive drugs were defined as hypertensive. ABO and Rh blood grouping was determined by slide haemagglutination method. The blood pressure was recorded with the help of mercury sphygmomanometer by palpatory and auscultatory methods. Both systolic and diastolic blood pressure of each patient was recorded in right upper limb at supine position.

Data Analysis

Data obtained were analyzed by using the appropriate statistical tool.

RESULTS

Age Incidence

In our study maximum incidence of hypertension occurred in fifth decade (Table 1).

Table-1: Age incidence

Age groups in years	Number of hypertensive patients	Percentage
30-39	4	2%
40-49	50	25%
50-59	100	50%
60-69	40	20%
70-79	5	2.5%
80-89	1	0.5%

Gender wise distribution of ABO blood groups

In our study 124 were males and 76 were females. The percentage distribution of ABO blood groups in females showed predominance of blood group B(15%) and least in blood group AB(2%)In hypertensive males prevalence of blood group B(41%) was high and blood group AB prevalence low(2%)(Table 2).

Table-2: Gender wise distribution of ABO blood groups [n(%)]

Blood group	Hypertensive males	Hypertensive females
A	16(8%)	20(10%)
B	82(41%)	30(15%)
O	22(11%)	22(11%)
AB	4(2%)	4(2%)
Total	124(62%)	76(38%)

Table-3: Distribution of Rh factor

Rh factor	Hypertensive male	Hypertensive females
Rh factor + ve	90(45%)	50(25%)
Rh factor- ve	34(17%)	26(13%)
Total	124(62%)	76(38%)

Distribution of Rh factor

In males 90(45%) were Rh positive and 50(25%) females were Rh positive (Table 3).

DISCUSSION

Hypertension is a major risk factor for cardiovascular disease. Healthy life style modifications are key step to prevent hypertension [11]. Earlier studies have showed genetic influence on blood pressure [1-3]. Many studies have shown blood group associations with various diseases like peptic ulcer, carcinoma [12]. The finding of hypertension and blood group association emphasizes the fact that ,this knowledge can be utilized to initiate healthy life style in the risk population. In this study more hypertensive patients were belonged to blood group B(56%) fallowed by blood group O(44%),blood group A (36%)and blood group AB(4%).Similar findings were observed in other studies [5,6,13]. Some studies have showed prevalence of hypertension in blood group A [4,14,15]. In some studies blood group O was prevalent among hypertensives[7,8,16]. Some studies did not show any association between blood groups and hypertension [9,10,12].

In our study Rh +ve males were 90(45%) and females were 50(25%). Similar higher prevalence of Rh positivity among hypertensive patients was observed in other study [12]. Butt AR *et al*. study showed there was no significant Rh positivity in hypertensives [15].

The finding of hypertension and blood group associations gives clue that there may be significant physiological differences among individuals of various blood types. They may be of clinical significance and needs further validation through large scale population based case control studies.

CONCLUSION

This study showed that more hypertensive patients were belonged to blood group B and fewer patients were in blood group AB. The main limitation of our study is small sample size. More population based studies with increased sample size needed in future; various geographical areas and populations should be considered.

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