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Frequency and Distribution of Blood Groups among Rural and Urban Population of Tumkur District, Karnataka.

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ABSTRACT

The ABO and Rhesus (Rh) blood group system are most important for blood transfusion purposes, parental testing, legal medicine and in population genetic study. This study was aimed to determine frequency and distribution ABO and Rh blood group patterns among the population which caters to Sri Siddhartha medical college hospital, Tumkur which is a tertiary care centre covering both rural and urban population of Tumkur district. Due to dearth of such studies data pertaining to distribution of different blood group systems in our local population is unavailable. Hence this study was taken up to generate data regarding the same which will be of benefit to the local ethnic population. This study was conducted to determine and compare the frequency of ABO and Rh blood groups. This observational study was conducted at Sri Siddhartha Medical College on participants who attended a medial exhibition and health awareness programme. Blood group was determined by commercially available standard monoclonal antisera by slide agglutination technique. 307 females (43.8%) and 394 males (56.2%). Out of 701 subjects, 394 (56.2%) were male and 307 (43.8%) were female subjects. The commonest ABO blood group present was O (39.4 %) followed by A (26.7%), B (26.2 %) and AB (7.7 %); while in Rhesus system, 92.3% subjects were Rh-positive and 7.7% subjects were Rh-negative. The study has a significant implication regarding the inventory management of blood bank and transfusion services for the patient admitted in our tertiary care teaching hospital.

Key Words: Blood groups, ABO, Rhesus (Rh)

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INTRODUCTION

Blood group antigens are hereditary determined and play a vital role in transfusion safety, understanding genetics, inheritance pattern, and disease susceptibility. The Landsteiner's discovery of ABO system in 1900 opened the door to the birth of a wide spectrum of discoveries in the field of immunohaematology, blood transfusion among humans irrespective of their natives, legal medicine, anthropology and the discovery of other blood group systems, all are deemed as an applications or as a result of Karl's discovery [1,2].

Nearly 700 erythrocyte antigens are described and organized into 30 blood group systems by the International Society of Blood Transfusion of which ABO and Rh are important.[3] All human populations share the same blood group systems; although they differ in the frequencies of specific types. The incidence of ABO and Rh groups varies markedly in different races, ethnic groups, and socio-economic groups in different part of the world 4].

The frequencies of ABO and Rh blood groups vary from one population to another and time to time in the same region. Knowledge of the distribution of ABO and Rh blood group is essential for effective management of blood banks inventory, be it a facility of a smaller local transfusion service or a regional or national transfusion service. It is, therefore, imperative to have information on the distribution of these blood groups in any population [5].

Knowledge of blood group distribution is also important for clinical studies, for reliable geographical information and it will help a lot in reducing the maternal mortality rate, as access to safe and sufficient supply of blood will help significantly in reducing the preventable deaths. Apart from their importance in blood transfusion practice, the ABO and Rh blood groups are useful in population genetic studies, researching population migration patterns as well as resolving certain medicolegal issues, particularly of disputed paternity cases. In modern medicine besides their importance in evolution, their relation to disease and environment is of being increasingly important [6, 7].It is, therefore imperative to have information on the distribution of these blood groups in any population group.

This study was aimed to determine frequency and distribution ABO and Rh blood group patterns among the population which caters to Sri Siddhartha medical college hospital, Tumkur which is a tertiary care centre covering both rural and urban population of Tumkur district. Due to dearth of such studies data pertaining to distribution of different blood group systems in our local population is unavailable. Hence this study was taken up to generate data regarding the same which will be of benefit to the local ethnic population.

MATERIAL AND METHODS

The present study was carried out at Sri Siddhartha Medical College on people of different age groups who attended Medical exhibition and awareness programme (MEDEX) conducted from 02/09/2013 to 7/09/2013. Blood groups were determined by slide method using commercially available standard antisera A, antisera B, and antisera D after validation

at blood bank. The blood group data was tabulated, analyzed and distribution of different blood group patterns was computed.

RESULTS

The results were analyzed and data compiled. Our study involving 701 people who attended Medical exhibition and awareness programme (MEDEX) at Sri Siddhartha Medical College, Tumkur included 307 females (43.8%) and 394 males (56.2%) participants which has been tabulated in table-1.

Table 1: Gender distribution of patients studied

Gender	No. of patients	%
Female	307	43.8
Male	394	56.2
Total	701	100.0

According to Table 2 depicted below the occurrence O blood group was highest among the participants where in 39.4%(276) were found to be of the same group which was followed by people with A blood group who constituted 26.7% (187) among the total people studied. The occurrence of B blood group was found to be 26.2% (184) among the total participants followed by people with AB blood group who were found to be of 7.7% (54) which was of least distribution.

Table 3 contains data of distribution of ABO blood groups and also the Rh group. Our results showed Rh-D blood group frequency of 92.3% of them being Rh positive and 7.7% of the participants were found to be Rh negative.

Table 2 : Blood group distribution

Blood group	No of patients	%
A	187	26.7
B	184	26.2
AB	54	7.7
O	276	39.4
Total	701	100.0

Table 3: ABO and Rh blood group distribution

Blood group	No. of patients	%
A -ve	13	1.9
A +ve	174	24.8
AB -ve	3	0.4
AB +ve	51	7.3
B -ve	24	3.4
B +ve	160	22.8
O -ve	14	2.0
O +ve	262	37.4
Total	701	100.0

DISCUSSION

Research on ABO group system has been of immense interest, due to its medical importance in different diseases. The ABO blood group system is not only important in blood transfusions, cardiovascular diseases, organ transplantation, erythroblastosis in neonates, but also one of the strongest predictors of national suicide rate and a genetic marker of obesity. [8,9]

India is a country with a lot of diversity based on race, religion and creed. Hence diversity has been observed in the distribution of blood groups in population within the country. There is dearth of such studies pertaining to distribution of different blood group systems in our local population which comes under Sri Siddhartha Medical College which is tertiary care centre covering both rural and urban population of tumkur district, Karnataka. Hence the present was taken up to create data for the blood bank inventory.

Our study showed that blood group O was commonest (39.4%) followed by group A (26.7%), group B (26.2%) and AB (7.7%) which was similar to a study conducted by Das et al which also showed that the occurrence of blood group O was the commonest [10,11]

Our study showed that prevalence of Rh positive was 92.3%, while only 7.7% of the participants were Rh negative (table 3) These figures are similar to other studies carried out by GiriPA et al [12] and Warghat NE et al. [13].

It is hoped that the data generated in this study would assist in the planning and establishment of a functional blood service that would meet the ever-increasing demand for safe blood and blood products. To conclude, it is advisable to do blood grouping studies in each region for drafting proper transfusion policies and supplying blood to the needy patients during emergency. In short, generation of a simple database of blood groups, not only provides data about the availability of human blood in case of regional calamities, but also serves to enable insight into possibilities of future burden of diseases.

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