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DISTRIBUTION OF ABO AND RH(D) BLOOD GROUP AMONG BLOOD DONORS AT TERTIARY CARE HOSPITAL, TAMIL NADU

Immunohaematology

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ABSTRACT

Background: ABO blood group was the first human blood group discovered by Landsteiner in 1900.The second type of blood group is the Rhesus system.

Objective: To study the distribution of ABO blood groups and Rh types among blood donors in GMC and ESI hospital, Coimbatore and compare it with other regions of India and all over the world.

Materials and methods: A cross sectional study was carried out on 3857 healthy donor population for a period of 5 years. ABO and Rh(D) blood grouping was performed in all the blood samples collected from the donors. Data on the frequency of ABO & Rh(D) were reported.

Results: The study results were O group [35%] B group [32.66%], A group [22.42%] and AB group [9.92%]. The Rh-positive type [93%] Rh-negative type [7%].

Conclusion: The study depicts the frequency of blood groups in Coimbatore district population and helps to prepare donor inventory in blood banks.

KEYWORDS

ABO group, Rh types, Donors

INTRODUCTION

The ABO blood group system was the first human blood group system to be discovered by Landsteiner in 1900. The ABO blood group system is the only system in which antibodies are consistently and predictably present in the serum of normal individuals whose red cells lack the antigens [1]. 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[2].The second type of blood group is the rhesus system. There are only two Rh phenotype such as Rh positive and Rh negative, depending on whether Rh antigen is present on the red cell or not.Rh system emerged as second most important blood group system due to haemolytic disease of new born and its importance in RhD negative individuals in subsequent transfusions once they develop Rh antibodies [1].

The present study was done to assess the prevalence of blood groups in different categories of Coimbatore district and to compare our results with other studies conducted in India and elsewhere in the world.

MATERIALS AND METHODS:

It was a cross sectional study carried out at Blood bank, Government Medical College and ESI hospital, Coimbatore, Tamil nadu. The study was conducted on 3857 blood donors for a period of 5 years (from January 2013 to December 2017) who were considered medically fit and accepted for blood donation during the study period. The blood collections were taken from the voluntary donors at blood donation camp as well as from donors donated in the blood bank All were of age between 18 and 60 years. After blood donation, blood group was determined by forward blood grouping (cell grouping) by test tube agglutination method. Commercially available standard antisera A, antisera B, and antisera D were used after validation at blood bank. Reverse blood grouping (serum grouping) was performed by test tube agglutination method with pooled known A, B, and O cell that are being prepared daily at the blood bank. Final blood group is confirmed only if both forward group (cell group) and reverse group (serum group) are identical. Rh negative blood groups were confirmed by antiglobulin technique (Du Test). All Du positive groups, blood were considered as Rh positive. The donor blood group data were recorded on specially formed proforma, tabulated, analysed, and compared with the similar studies by other authors.

OBSERVATION AND RESULTS:

The total donors studied from January 2013 to December 2017 were 3857 (Table-1). The female donors constituted only about 100(2.59%)of total donors. The commonest ABO blood group was O (35%) followed by B (32.66%), A (22.42%) and AB (9.92%) respectively (Table-2). The distribution of Rhesus (Rh) D factor were as follows, 3581 (93%) Rh D positive and 276(7%) Rh D negative(Table-3) The distribution of ABO Rh positive blood groups were as follows, blood group A positive-20.92%, B positive -30.36%, O positive- 32.56% and AB positive -9.02% (Table-4), Among Rh D negative blood donors, O negative- 2.43% was most common followed by B negative - 2.3% ,A negative -1.5% and AB negative - 0.9% (Table-5). There was no Bombay blood group detected during the study period.

Table-1 Year wise distribution of ABO & Rh blood group among blood donors

	A		B		AB		O		
Year	A+	A--	B+	B-	AB+	AB-	O+	O-	Total
2013	155	8	205	26	79	3	195	19	690
2014	154	20	152	10	65	0	279	15	695
2015	123	7	230	18	39	2	217	22	658
2016	172	10	243	13	29	2	319	19	807
2017	203	13	341	22	136	28	246	19	1007
	807	58	1171	89	348	35	1256	94	3857

Table-2: Frequency of ABO Blood Groups among Blood Donors

Blood group	No of donors	Percentage
O	1350	35
B	1260	32.66
A	865	22.42
AB	383	9.92

Table-3 Frequency of Rh blood group among blood donors

Rh Blood group	No of donors	Percentage
Rh Positive	3581	93
Rh Negative	276	7

Table-4: Frequency of ABO Blood Groups among Rh positive blood Donors

Blood group	No of donors	Percentage
O	1256	32.56
B	1171	30.36
A	807	20.92
AB	348	9.02

Table-5: Frequency of ABO Blood Groups among Rh Negative blood Donors

Blood group	No of donors	Percentage
O	94	2.43
B	89	2.3
A	58	1.5
AB	35	0.9

DISCUSSION:

In the present study males comprised the significant donation group as compared to female donors which is similar with other Indian studies. [3,4] The lower rate of donation is due to fear of donation and low haemoglobin level among females. The commonest blood group was 'O' followed by B, A and AB. The findings were therefore similar to that expected under the Asiatic trend of O > B > A > AB. [5] This was conflicting with other studies from North India in which blood group B was found to be predominant. [6,7,8] In the countries like Pakistan and Nepal the predominant blood groups were B and A respectively. [9,10]. In USA [11], the predominant blood group was O, A followed by B and AB. In the present study Rh positive group was found to be more predominant [93%] and Rh-negative group less predominant [7%]. Other studies inside and outside India also shows the similar results.

Comparison of frequency percentage of ABO and Rhesus blood groups of our study with studies in different regions of India and with different countries

Sr.no	Location of study	A	B	AB	O	Rh+ve	Rh-ve
1.	Present study	22.42	32.66	9.92	35	93	7
2.	Lucknow	21.73	39.84	9.33	29.10	95.71	4.29
3.	Bangalore	23.85	29.95	6.37	39.82	94.2	5.8
4.	Pakistan(Swat)	27.92	32.40	10.58	29.10	90.13	9.87
5.	Nepal	34	29	4	33	96.7	3.3
6.	USA	41	9	4	46	85	15

CONCLUSION:

The present study concludes that most common blood group is 'O' and least common is AB amongst the blood donors at Government medical college and ESI hospital, Coimbatore, Tamil Nadu. Regarding Rhesus blood group system, Rh positive donors were 93% and Rh negative were 7%. Blood donation by the females was very low and it needs to be increased by improving health status and awareness about blood donation. The data generated in the present study will be useful to health planners to face the future health challenges in the region.

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