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Survey of ABO Blood groups and Rhesus factor In a Large Scale Study of different rural areas of Pulivendula Constituency

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Abstract:

Background: India is a great diversity in race, religion and creed. The same diversity has been observed in the geographical distribution of blood groups in the population within the country. ABO and Rh blood groups are the most important blood groups in human beings.

Aim: A retrospective study was conducted at Pulivendula constancy continuously for four years from 2014 to 2018 Government to determine and compare the distribution of ABO and Rh blood groups.

Materials and Methods: A retrospective study of four years was carried out at our programme in Pulivendula constancy in Andhra Pradesh, South India. Data about the blood groups of donors was collected from our data register from 2014 to 2018(Annual programme).

Results: The total number of donors studied from 2014 to 2018 was 1256. The distribution of blood groups was : blood group 'A' 135 (10.74 %), 'B' 639(50.87 %), 'AB' 153(12.18 %) and ' O ' 329(26.19 %). In both Rh D positive and Rh D negative person's blood group ' O ' was the commonest followed by blood group ' B ' Blood group ' A ' is the least common.

Conclusion: The "B" blood group is significantly high in our population and comparatively low "A" blood group. Every transfusion centre should have a record of the frequency of blood group systems in their population.

Keywords: ABO- Blood groups, Ethnicities, Blood donors, Drought area.

1. Introduction

Know present about 400 erythrocyte antigens have been identified. International Society of Blood Transfusion organized them into 30 blood group systems of which ABO and Rh systems are important for transfusion purposes. The discovery of A, B and O blood groups by Karl Landsteiner in 1900 was an important achievement in the history of blood transfusion. Alfred Von Decastello and Adriano Sturli discovered the fourth type of AB, in 1902. Later Rh group was discovered by Landsteiner and Weiner in 1941. Blood groups are genetically determined. The vast majority are inherited by Mendelian fashion. The genes of ABO and Rh (D) are located on chromosomes 9 and 1 respectively. The incidence of ABO and Rh groups varies markedly in different races, ethnic groups, across geographical boundaries and also from time to time in the same region. Blood groups are also known to have some association with diseases like duodenal ulcer, diabetes mellitus, urinary tract infection, Rh incompatibility, cardiovascular diseases and malignancies. This study is aimed to determine the frequency and distribution of ABO and Rh blood group patterns among voluntary blood donors in a tertiary care teaching hospital in South India and compare with other data from similar studies within India and all over the world.

2. Subjects and methods

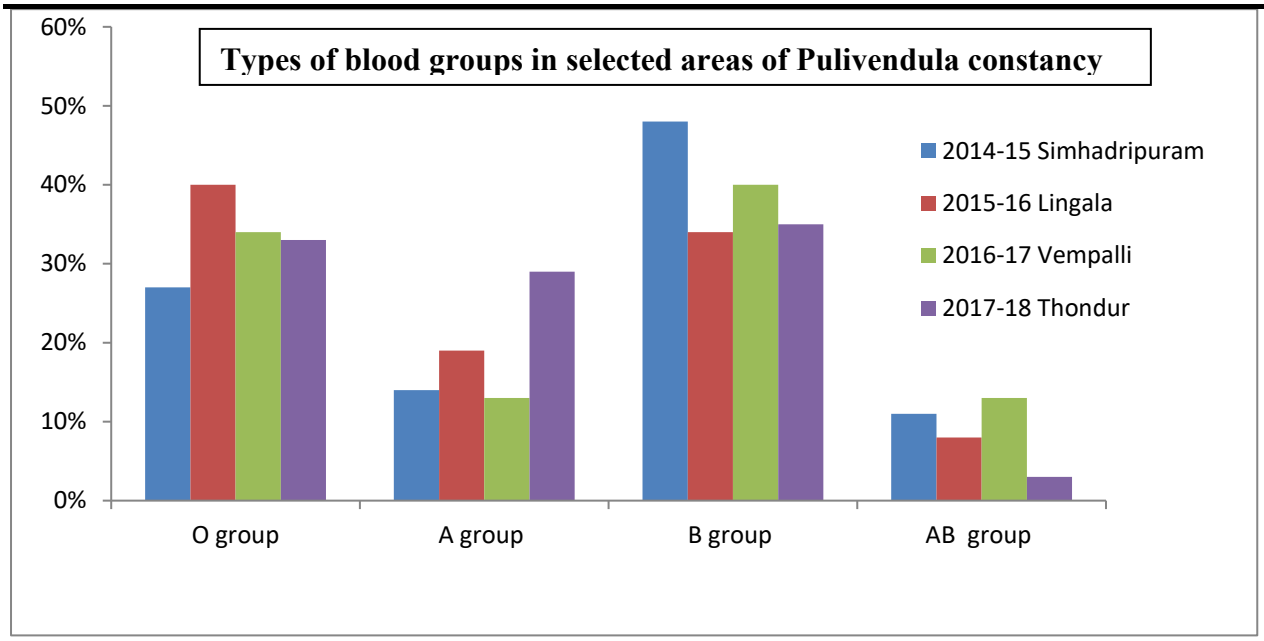
2.1. Study type

Our study was a descriptive cross-sectional one. The study population included the blood donors visiting our camps were conducted in different villages nearby pulivendula constituency. We used the rapid slide method to determine the blood groups. The study was performed 3 times every year from 2014 to 2018 on all the donors. On donor forms, the donor ethnicity (race) was asked from every donor in addition to standard questions, and cellular and serum blood grouping was conducted on samples by hemagglutination and hemolytic reactions. As the postal address was recorded on donor forms, data collection was done using interviews and laboratory tests. The forms and laboratory test results were then analyzed using MS-excel.

3. Results

Our results showed that blood group B was the most frequent and the O blood group was the second most frequent blood group among all the ethnic groups in Pulivendula constituency (Fig. 1). Thondur AB (03%) lowest and highest B (48%) level of group determination, respectively (Table 1). The highest prevalence of blood groups was related to B and the lowest prevalence to the AB blood group.

Year	Region	O group	A group	B group	AB group
2014-15	Simhadripuram	27%	14%	48%	11%
2015-16	Lingala	40%	19%	34%	8%
2016-17	Vempalli	34%	13%	40%	13%
2017-18	Thondur	33%	29%	35%	03%



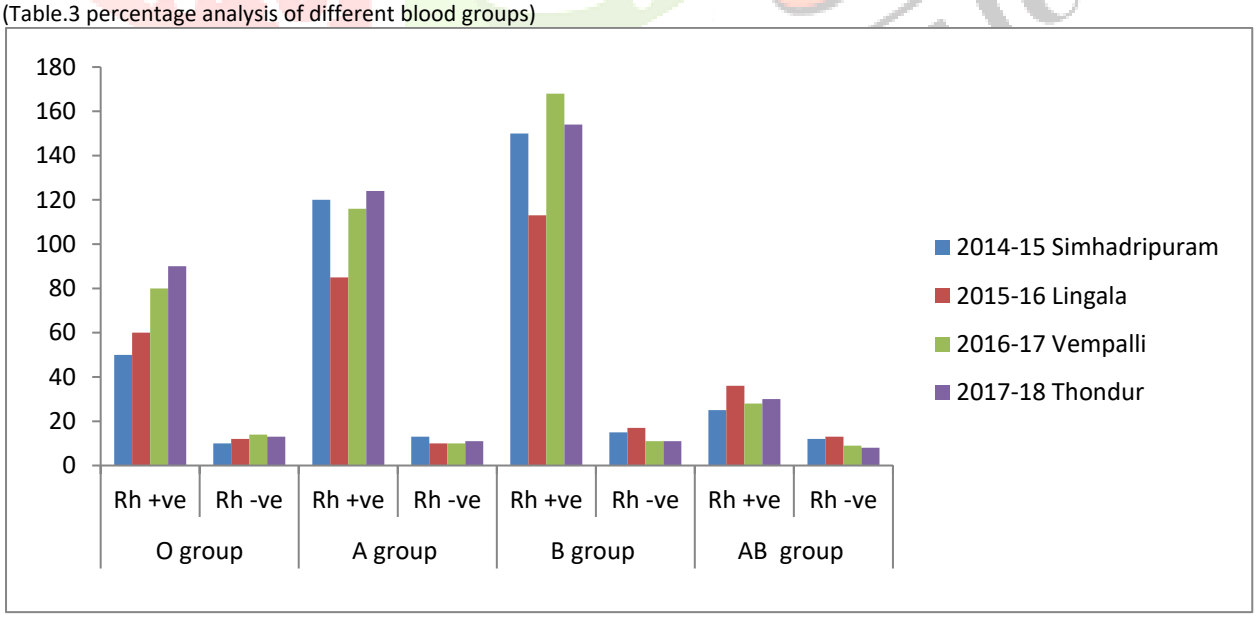
(Table.1 showing different types of blood groups in selected regions.)

Year	Region	O group		A group		B group		AB group	
		Rh +ve	Rh -ve	Rh +ve	Rh -ve	Rh +ve	Rh -ve	Rh +ve	Rh -ve
2014-15	Simhadripuram	50	10	120	13	150	15	25	12
2015-16	Lingala	60	12	85	10	113	17	36	13
2016-17	Vempalli	80	14	116	10	168	11	28	09
2017-18	Thondur	90	13	124	11	154	11	30	0

(Table.2 Rh identification in collecting samples)

Year	Region	O group	%	A group	%	B group	%	AB group	%
2014-15	Simhadripuram	60		133	10.77	165	50.99	37	12.21
2015-16	Lingala	72		95		130		49	
2016-17	Vempalli	94		126		179		37	
2017-18	Thondur	103	26.25	135		165		30	
Total	(1253 Samples)	329		135		639		153	

(Table.3 percentage analysis of different blood groups)



Discussion

India carries a lot of diversity in the distribution of blood groups. Knowledge of the frequency of blood groups is essential in determining the direction of recruitment of voluntary donors as required for different areas of the selected region. In India, because of varied cultural habits, social taboos, lack of motivation and fear of blood donation, female donors are very less. In addition, a large number of females from the menstruating age group is anaemic with low weight, so declared unfit for blood donation. In our study, we observed a significantly low percentage of female donors (0. 3 %). Akin to the studies of Mallikarjuna S and Giri PA et al it is observed that the predominant percentage of blood donors is males. Geographic distribution of blood groups in India shows that in Northern, Central and Western parts of India ' B' is the commonest blood group whereas in Eastern and Southern India ' O ' is the most frequently occurring blood group. About the Rhesus system, in our study frequency of Rh-positive was 95.28 %, while only 4.72 % was Rh-negative. Rh-positive groups are the predominant groups. In comparison similar frequencies of the prevalence of Rh-negative groups.

Conclusion

This much knowledge (blood groups) is highly essential for transfusion services that contribute to patients' health care. Access to a safe and sufficient blood supply will help to reduce morbidity and mortality rates. Our study has a significant implication of the generation of a simple database of blood groups in this area. It not only provides scientific data but also serves to enable insight into possibilities of the future burden of blood group associated diseases.

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