

Distribution of ABO and Rh Blood Groups among Students of Bhavan's Vivekananda College, Secunderabad, Telangana, India

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Abstract: ABO and Rh blood groups were tested for seven hundred and nine college students of age group 18 to 25. Blood samples were collected from the students by finger-prick method and blood groups were examined by slide-test haemagglutination method. The highest with percentage frequency was observed for the blood group O (36.32%) followed by B (34.37%), A (22.66%) and the least percentage frequency was AB (6.48%). In the case of Rh(D)+ve, the frequency observed was 93.94% and that for Rh(D)-ve it was 5.9%.

Keywords- ABO, Rh-D, Blood group system, haemagglutination method.

I. Introduction

An important milestone in the history of blood transfusion was the discovery of the ABO blood groups by Karl Landsteiner, followed by discovery of Rh (D) antigen [1, 2]. Landsteiner's achievements lead to several discoveries in the field of immunohaematology. The ABO blood group is useful in selecting the appropriately matched blood group during blood transfusion, organ transplantation, finding out association of blood groups and diseases etc. ABO blood group system classifies blood groups of people into four different types namely A, B, O and AB. Percentages of blood groups have already been reported to vary (i) in people belonging to different communities (ii) from one population to another [3]. For instance in the Caucasians (in the United States), the frequency distribution is O,47%; A,41%; B,9% and AB,3% and amongst the blacks in the United states, the distribution is type O,46%; type A,27%; type B,2% and AB,7% [4]. Further, previous studies suggest that understanding the distribution frequency of the various blood groups could help in identifying genetic and ancestral relation of humans [5]. Acquiring knowledge on distribution of ABO blood groups at local and regional levels will not only be helpful in the effective management of blood banks but also in safe blood transfusion services [6]. Hence, the present study was planned with the aim of determining the distribution of ABO blood groups in healthy young adults in college. This study may enable us to contact individuals belonging to a particular blood group at times of medical emergencies when blood transfusion is required.

II. Materials and Methods

2.1 Collection of Specimens

After aseptic cleaning of the left ring finger tip with 70% ethyl alcohol, three drops of blood was placed on a grease free clean glass slides (chambers labelled A, B and D). Particulars of each participant were taken in a data collection sheet.

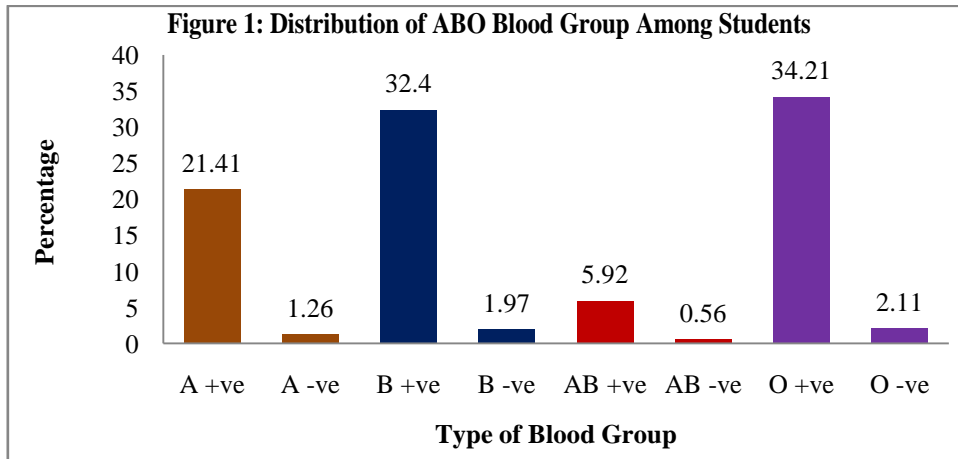
2.2 Blood grouping

Blood groups were determined on the basis of agglutination (antigen-antibody reaction) employing commercial monoclonal anti-sera anti- A, anti-B, anti-AB and Rh D procured from Span Diagnostics Limited, Gujarat, India. For the ABO and the Rh tests, a drop of each of the antisera, anti A, anti B and anti D was added and mixed with each blood sample placed on the slide. After mixing the cells and reagent thoroughly over an approximate 20mm circular area, the slide was gently rotated and examined for haemagglutination after 2 min.

III. Results

Blood samples from 709 students (unrelated individuals of both genders aged between 18 and 25) were obtained with their consent upon request. The distribution of ABO blood groups with Rh (D) positive and negative is represented in Table 1 and the relative percentage distribution is shown in Fig 1. In the Rh(D) positive groups, O group was more commonly distributed followed by B, A and AB. Analysis of Rh (D) negative subjects also revealed a similar pattern. Overall, O blood group was predominant (36.32%) followed by B (34.37%), A (22.66%) and AB (6.48%). The results also revealed that $\approx 94\%$ of the population under study were Rh(D)positive and only $\approx 6\%$ were Rh(D) negative (Table 2) and Fig 2. A representative photograph is shown in fig.3.

ABO Group	A	B	AB	O
+ve Number/(%)	152 (21.4%)	230 (32.4%)	42 (5.92%)	243 (34.21%)
-ve Number/(%)	9 (1.26%)	14 (1.97%)	4 (0.56%)	15 (2.11%)
Total Number/(%)	161 (22.66%)	244 (34.37%)	46 (6.48%)	258 (36.32%)



	Rh(D)	
	+ve	-ve
Number	667	42
%	94.08	5.92

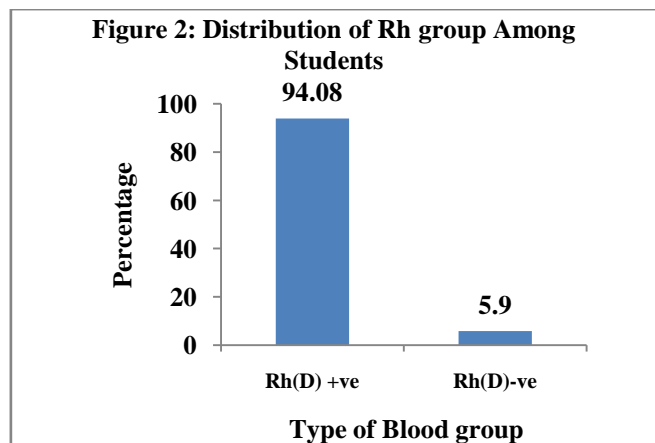
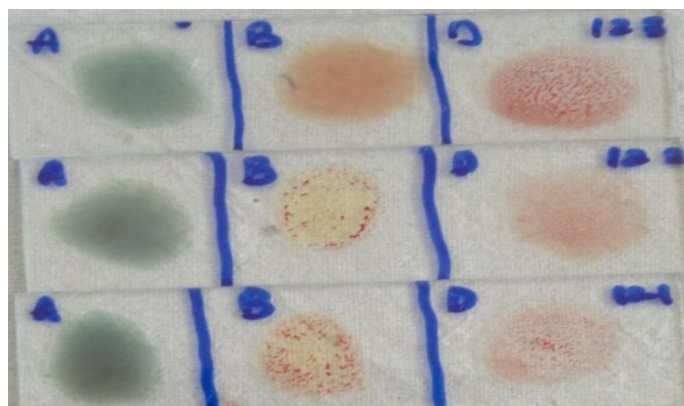


Figure3: Photograph showing blood group analysis



A comparison of our analysis with those reported in India and other countries are presented in Table 3.

Place of Study	A (%)	B (%)	AB (%)	O (%)	Rh+ve (%)	Rh-ve (%)
Within India						
RRD, Telangana ⁷	29.71	28.33	9.08	32.81	97.01	2.99
Nellore, AP ⁸	19.61	33.98	6.72	40.09	94.92	5.07
Tumkur, Karnataka ⁹	21.54	31.85	8.71	37.90	94.65	5.35
Pune City ¹⁰	27.5	28.87	6.12	37.5	-	-
Maram, Manipur ¹¹	20	27.3	17.7	35	65	35
Punjab ¹²	21.9	37.6	9.3	31.21	97.3	2.7
Present study	22.66	34.37	6.48	36.32	94.08	5.92
Outside India						
Lagos, Nigeria ³	25.3	16.7	2.7	55.3	94	6
Iwo, Nigeria ¹³	29.4	15.8	3.2	51.6	93.7	6.3
Bangladesh ¹⁴	23.5	39.8	9.2	27.6	97.4	2.6
Pakistan ¹⁵	23.8	38	10	28.20	89.1	10.9

IV. Discussion

Blood grouping is an important parameter for social, professional and medical needs. In the present study, the frequency of blood group 'O^{+ve}' was the highest (34.21%) and the least frequency was that of blood group 'AB^{-ve}' (0.56%). Several studies within the Telangana state [7] and rest of India [8-12] and other countries [13-15] have reported variations in the blood group distribution in diverse populations. This study helped in analyzing the distribution of blood groups among college students who comprise a heterogeneous population within this region. Such a study would create awareness about self-blood grouping and also enable one to prepare a database of the available blood groups which can be utilized during medical emergencies for safe blood transfusion.

V. Acknowledgment

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