

Frequency of ABO and Rh Blood Groups among High School Children of Alwal, Secunderabad, Telangana, India

M. K. Sukumaran¹, A. Sai Padma², S. Vanitha³, D. Rajani⁴, S. Padma⁵
^{1,2,3,4,5} Department of Biochemistry, Bhavan's Vivekananda College, Secunderabad, Telangana, India

Abstract: ABO and Rh blood groups were tested for one hundred and thirty one government high school children as part of an awareness programme about knowing one's own blood group. The data was analyzed to understand the distribution of ABO blood groups among them. Blood samples were collected by finger-prick method and blood groups were examined by slide-test haemagglutination method using commercially available anti-sera A, B, and Rh (D). The highest percentage frequency was observed for the blood group O (41.20%) followed by B (35.86%), A (18.31%) and the least percentage frequency was for AB (4.58%). In the case of Rh(D)^{+ve}, the frequency observed was 96.18% and that for Rh(D)^{-ve} was 3.82%.

Keywords: ABO, Rh (D), Blood group system, Anti-A, Anti-B, Anti-AB.

I. Introduction

Karl Landsteiner discovered the ABO blood group system in the year 1900. Even 100 years passed after his discovery, detecting blood group of an individual is of utmost importance even today for maintaining blood banking records and for safe transfusion [1]. Individuals are categorized into four major blood groups (A, B, AB and O) according to presence of antigens on the surface of RBC. The antigens present on RBC are oligosaccharide chains covalently attached to glycolipids or glycoproteins. All humans have the enzymes for synthesizing O antigen. Glycosyltransferase, an additional enzyme present in A group individuals adds an extra N-acetylgalactosamine to O antigen to form A antigen. Similarly a different transferase present in B group individuals adds an extra galactose to O antigen to form B antigen. Presence of both the enzymes produces both A and B antigen, hence AB blood type, and absence of both these enzyme produces O antigens only, hence O blood type.

II. Materials And Methods

Specimen collection and Blood typing

A total of 131 blood samples from high school children (girls, aged between 13-15 yrs) were collected after obtaining permission from the local government high school authorities. Participation of children was voluntary and for their benefit to know their own blood group. Blood was collected by finger prick method using disposable needles and the ABO and Rhesus blood grouping was carried out using the slide method [2].

III. Results

Data obtained from the ABO blood groups of 131 high school children was analyzed. 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 groups. Similar observations were recorded in case of Rh (D) negative group. The overall distribution of ABO blood group in the descending order was, O (41.20 %) followed by B (35.86%), A (18.32%) and AB (4.58%). The results also revealed that ≈96% of the population under study were Rh (D) positive and only ≈3.8% were Rh (D) negative (Table 2) and Fig 2. A representative photograph showing ABO blood grouping is shown in Fig.3.

ABO Group	A	B	AB	O
+ve	22	47	6	51
Number/(%)	(16.79%)	(35.86%)	(4.58%)	(38.91%)
-ve	2	0	0	3
Number/(%)	(1.53%)	(0%)	(0%)	(2.29%)
Total	24	47	6	54
Number/(%)	(18.32%)	(35.86%)	(4.58%)	(41.20 %)

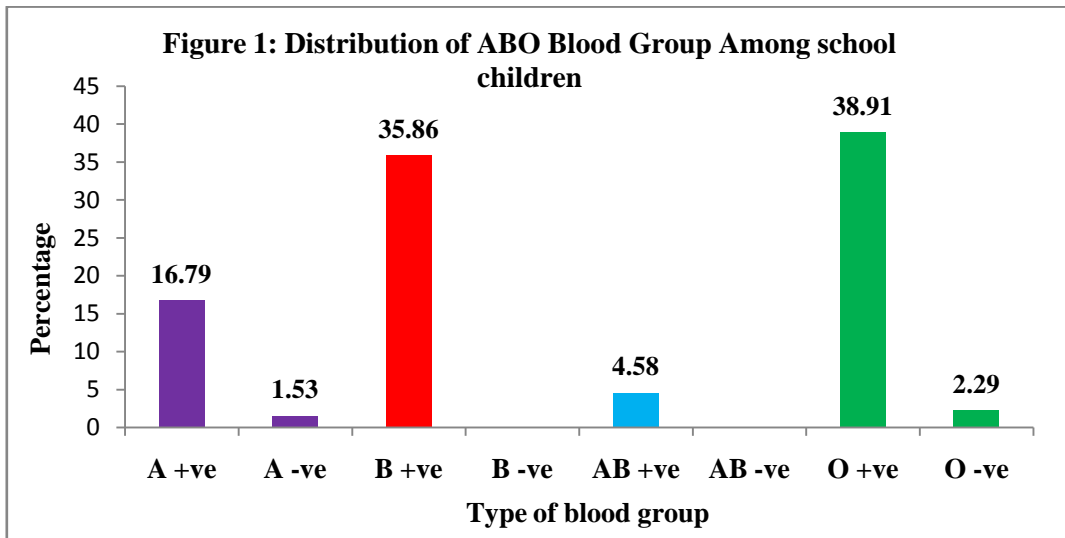


Table 2: Distribution of Rh group among school children

	Rh(D)	
	+ve	-ve
Number	126	5
%	96.18	3.82

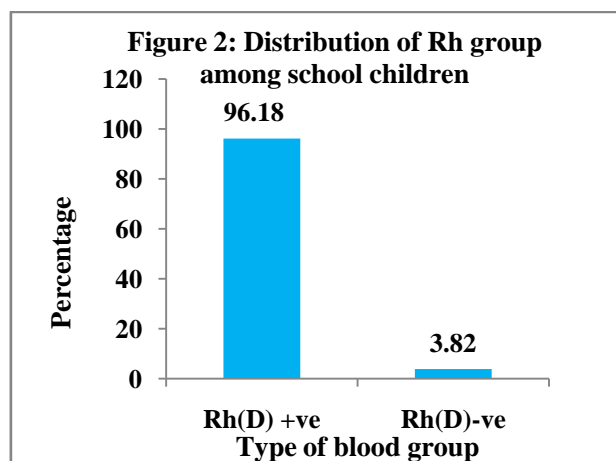
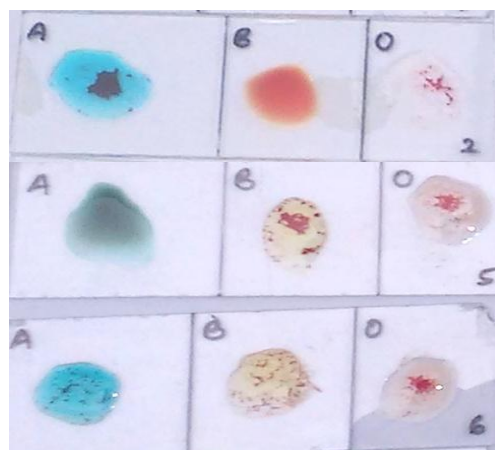


Figure3: Photograph showing blood group analysis



Prevalence of blood groups among the various populations of southern region of India along with our studies is presented in Table 3.

	A	B	AB	O	Rh(D) ^{++ve}	Rh(D) ^{--ve}
Hyderabad, Telangana [2]	22.66	34.37	6.48	36.32	94.08	5.92
Nellore, Andhra Pradesh [3]	19.61	33.58	6.72	40.09	94.92	5.07%
Vellore [4]	18.85	32.69	5.27	38.75	94.53	5.47
Bangalore [5]	23.85	29.95	6.37	39.82	94.20	5.80
Tumkur, Karnataka[6]	26.7	26.2	7.7	39.4	92.3	7.7
Present study	18.32	35.86	4.58	41.20	96.18	3.82

IV. Discussion

In the present study, the percentage frequency of blood group O (41.20) was observed as the highest, followed by B (35.86), A (18.32) and AB (4.58). As observed in our previous studies [2], the present study also indicated the same pattern of blood group distribution, emphasizing the fact that individuals of the same region may possess the similar trend of blood group distribution irrespective of age. Studies at Southern India also have shown a similar trend [3-6]. Although blood group of a child is normally informed to parents during birth of a child in hospitals, there are however, many incidences where many children are unaware of their blood group. The present study was an attempt to bring awareness about their own blood group to government high school children which is necessary in case of medical emergencies.

Acknowledgment

Authors are thankful to Management and Prof. Y. Ashok, Principal of Bhavan's Vivekananda College for providing necessary facilities and constant encouragement. We are also thankful to authorities of ZP High School, Alwal, Secunderabad, Telangana for permitting us to use the data for analysis. We also thank students of Biochemistry department, BVC for assisting us in carrying out this study.

Reference

- [1] Honig CL, Bore JR . Transfusion associated fatalities: A review of Bureau of Biologic reports 1976 – 1978. Transfusion, 20, 1980, 653 –661.
- [2] M. K. Sukumaran, A. Sai Padma, D. Rajani, S.Vanitha and S. Padma, Distribution of ABO and Rh Blood Groups among Students of Bhavan's Vivekananda College, Secunderabad, Telangana, India, IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), Volume 14, Issue 12 Ver. X (Dec. 2015), 59-62.
- [3] N. Mohan Rao , Bhavana Grandhi, Vissa Shanthi, Syam Sundar Rao Byna, Swathi Sreesailam & B. Krishna Murthy, Study of Blood Groups in Blood Donors in Narayana Medical College & Hospital, Nellore, (AP), India, International Journal of Current Medical And Applied Sciences, vol.6. Issue 2, April: 2015. PP: 110-113
- [4] Das PK, Nair SC, Harris VK, Rose D, Mammen JJ, Bose YN, Sudarsanam A, Distribution of ABO and Rh-D blood groups among blood donors in a tertiary care centre in South India. Jan;31(1), 2001:47-8.
- [5] Sundar Periyavan, SK Sangeetha, P.Marimuthu, BK Manjunath, and DM Seema, Distribution of ABO and Rhesus-D blood groups in and around Bangalore, Asian Journal of Transfusion science.2010,Jan ;4(1):41
- [6] Shashiraj HK, Venkatesh .G, Sendilkumaran D, and Sachin JI, Frequency and Distribution of Blood groups among Rural and Urban population of Tumkur District, Karnataka, Research Journal of Pharmaceutical , Biological and Chemical Sciences, Jan-Feb.5(1):2014, 564.