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The Frequency Distribution Of Abo Blood Group And Rhesus Factor (+ve And -ve) Among Students And Staff Of Government College, University, Hyderabad, Sindh, Pakistan

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ABSTRACT

The distribution of ABO blood groups and Rhesus (Rh) factor among populations has long been a subject of scientific inquiry due to its implications for medical practice, transfusion medicine, and understanding genetic diversity. The prevalence of different blood types varies across populations, reflecting both genetic and environmental influences. Understanding the frequency distribution of blood groups within specific populations is crucial for the inventory of blood bank management and evaluating the risk of hemolytic disease in newborns. Objectives: The objective of conducting this research was to know the frequency distribution in male and female among the individuals of Government College University Hyderabad. Methods: Blood samples were collected from participants, and ABO blood groups were determined using antisera. Descriptive statistics were employed to analyze the data. Results: The frequency distributions of (ABO) blood groups within the contributors is presented as blood group B emerged as the most prevalent, representing (35.65%) of the total participants, followed by blood group O (29.6%), A (25.6%), and AB (9.0%). Rhesus-positive individuals constituted (94.84%) of the total participants, with Rhesus negative observed in (5.5%) of the population. Gender-specific analysis revealed a uniform distribution of blood group B across males and females. Conclusion: These findings highlight the significance of understanding blood group diversity for clinical practice and underscore the need for further research in this area.

INTRODUCTION

The variances occur in (ABO) blood groups of ethnic groups of the students and blood group (O) frequency prevalent high, while (AB) with lowermost frequency (Tesfaye, K. and Petros, Y., *et.al.*, 2015). The (B) blood group type is the most common blood group in the Pakistani population with a frequency of (33.37%) trailed by (O) blood group about (33.14%,) blood group (A) (23.99%) and blood group (AB) is (9.74%), whereas Rh (D) factor positive is among (90.63% of total population, while (9.37%) are Rh (D) negative (Rehman, G. U. and Shi, H., 2021). In another study with regard to Rh blood group system (89.03%) donors were found Rh (D) positive and (10.97%) were Rh (D) negative (Noshkey, A. Yazdani, M. S., *et.al.*, 2019). The serological markers serve as vital indicators for the consideration of genetic variations among populations and extensively studied throughout the world to provide valuable understanding into the dynamics of population and its structure (Hidalgo, A. and Chang, J. *et.al.*, 2009). The intra-tribal marriages may be a factor that affects distribution of the blood groups among population. These variations occur in distributions of different blood groups within country is by virtue of factors like marriage and so on. The purity of blood group types depends on various factors such as immigration, illnesses, inter-relation reproductive opportunities, customs, traditions, geographical distributions and original blood type (Olanlyan, T.O. and Meralyebu, A. B., 2013). The comparative study on the frequencies of (ABO) and (Rh) blood groups in males and female's donors describe most prevalent Rh positive in blood group (B) (39.84%) followed by blood group (O) positive (29.10%), blood group A positive (21.73%) and (AB) positive (9.33%). Whereas, among female donor's Rh-positive was in blood group (B) (35.08%) as most common positive blood group followed by group (O) positive (26.31%), (A) positive (22.83%) and (AB) positive (15.78%). Rh-negative donors were (4.29%) among the total donors (Tulika, C. and Gupta, A. 2012). In 1940, Levine and Stetson described Rh blood group system associated with causes of hemolytic disease in Fetus & New-born (HDFN). Landsteiner and Wiener described Rh antibodies.

Originally Rh antigens denoted to D and C and E as related ones (Pourazar, A. 1994). The knowledge of blood groups system ABO and Rh-D is vital for substantial for inventory in blood bank management and blood compatibility and also assessing the chances of hemolytic diseases in new-born babies. Diverse blood groups show particular association of different diseases (Daniels, G. L. and Castiho, L. 2008). Henceforth, it is significant to know the distribution of blood groups in population (Falus, A. G., and Ademowo, O. G., 2000). Rhesus

system is the second most significant system of blood groups due to the hemolytic diseases in newborns specifically in case of Rhesus D negative ensuing in transfusions when Rhesus antibodies developed (Pourazar, A. 1994). In various population the frequency of Rhesus factor blood may vary (Falusi, A. G. and Ademowo, O. G. 2000). The Rhesus (D) negative about (7%) and Rhesus (D) positive (93%) among African and American. In European's population, Rhesus (D) negative is about (16%) and positive is (84%) Rhesus (D) negative (<1%) and Rhesus (D) positive about (99%) in African American (Woo, S. M. and Joo, 2013).

Present study was conducted to know the frequency of blood groups in male and female among the workers of Government College, University, Hyderabad, Sindh, Pakistan.

MATERIALS AND METHOD

This study was conducted at GC University, Hyderabad, involving (199) participants including students, faculty, and visitors from various Departments of the University. Among the participants, (134) were female and (65) were male. Blood samples were collected from the participants using a pricking needle method during a two-day blood group camp. Each participant's blood was collected on slides, with three drops per slide. Upon sample collection, blood grouping was performed using antisera for blood groups (A, B, AB, and O). Each antiserum was added to a separate drop of blood on the slide. The mixtures were allowed to rest for 30 seconds to asses adhesion reaction. The results of the agglutination reactions were interpreted immediately after the resting period. Agglutination in a blood drop indicated the presence of the corresponding blood group antigen. Agglutination in blood drop (A) indicated blood group A, while agglutination in blood drop B indicated blood group B. Agglutination in both drops indicated blood group AB, and non-agglutination in both drops indicated blood group O. Descriptive statistics were used to summarize the frequency distribution of blood groups within participants. The frequencies of different blood groups were calculated and presented based on gender.

RESULTS

The frequency distributions of blood groups (A, B, AB, and O) among the participants, categorized by gender, are presented in the table below. The frequency distribution among the participants at Government College, University, Hyderabad, Sindh, Pakistan showed that the blood group B has the highest (35.6%), in which the females were (24.1%) and male (11.5%), while AB blood group has the lowest frequency distributions (9.0%), in which female has (5.0%) and male was (4.0%) as shown in (Table 1 and Fig.1). In the Rhesus positive blood group frequency

of (A) blood group percentage was (28%) and blood (B) (31%) blood group (AB) (10%) and blood group (O) (31%) as shown in (Fig.2). The AB blood group was least common. The (Rh ve$^+$) and varied between the ABO blood groups. The (Rh ve$^+$) was (94.84%) with highest frequency (Figs.2 and 3) while Rhesus (Rh ve-) was (5.5%) with lowest frequency as shown the all the data presented in (Figs.3).

TABLE: 1: ABO BLOOD GROUPS DISTRIBUTION AMONG MALES AND FEMALES (STUDENTS, FACULTY MEMBERS AND VISITORS) IN GOVERNMENT COLLEGE, UNIVERSITY HYDERABAD, DURING BLOOD GROUP DETERMINATION CAMPING 2023.

Gender	A	B	AB	O	Total
Male	17 (8.5%)	23 (11.5%)	08 (4.0%)	17 (8.5)	58
Female	34 (17.0%)	48 (24.15%)	10 (5.0%)	42 (21.1)	124
Total	51 (25.6%)	71 (35.65%)	18 (9.0%)	59 (29.6)	199

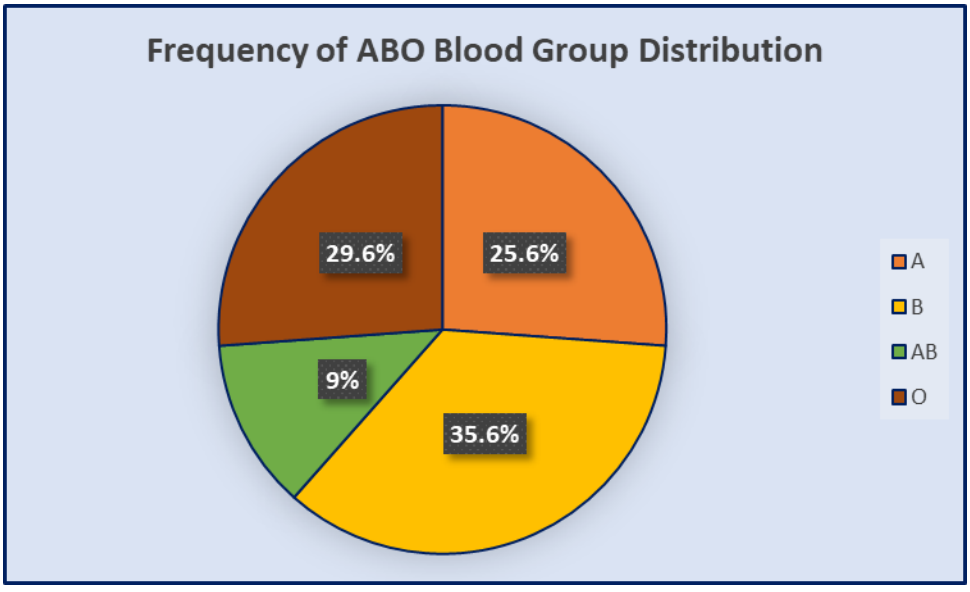

FIG: 1 SHOWING DISTRIBUTION OF ABO BLOOD GROUPS IN THE PARTICIPANTS FOR MALE AND FEMALES IN GOVERNMENT COLLEGE UNIVERSITY, HYDERABAD, SINDH, PAKISTAN.

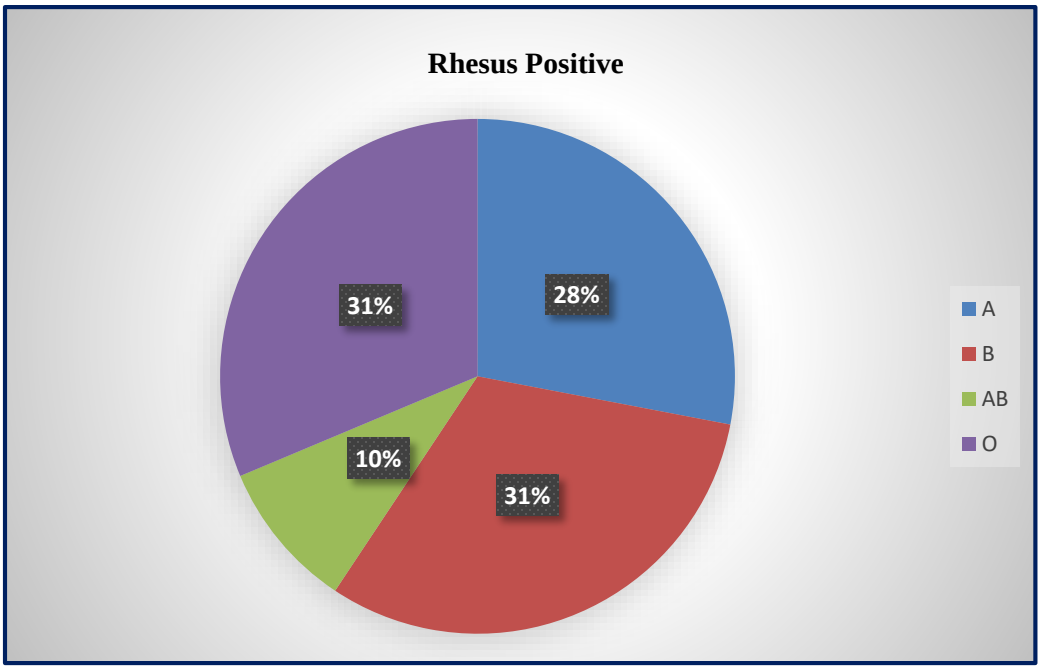

FIG 2: RHESUS POSITIVE BLOOD GROUP DISTRIBUTIONS IN THE INDIVIDUALS OF GOVERNMENT COLLEGE, UNIVERSITY HYDERABAD, SINDH, PAKISTAN.

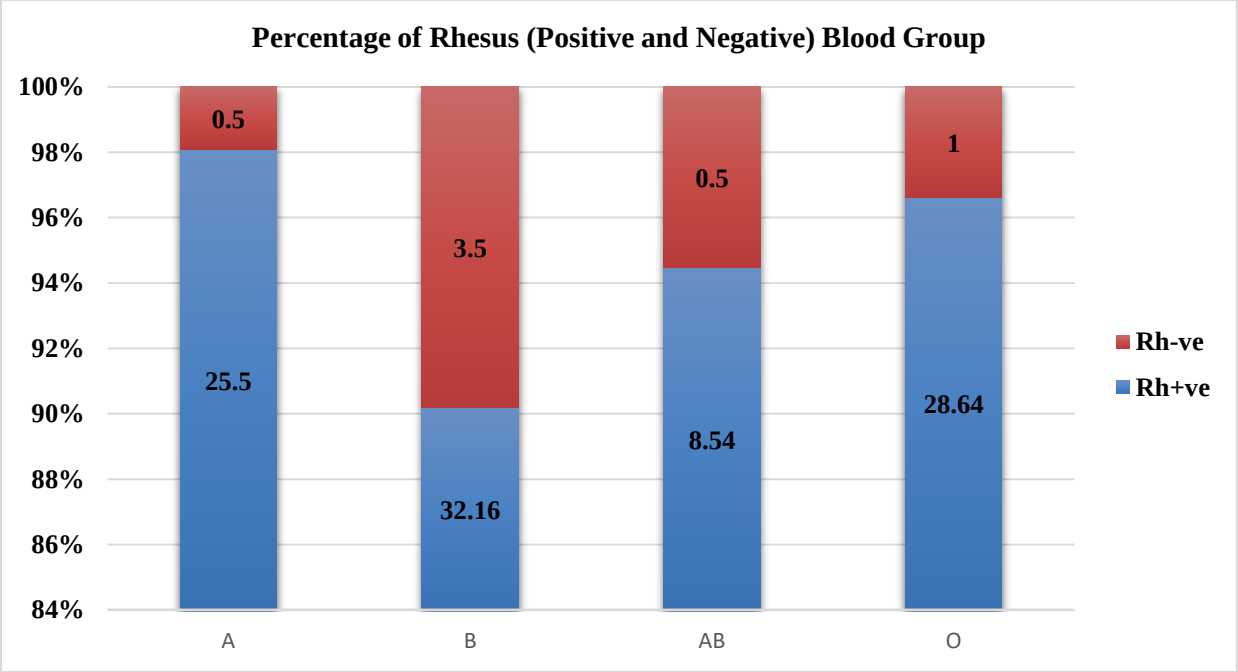

FIG 3: DISTRIBUTIONS OF (ABO) BLOOD GROUP AMONG THE INDIVIDUALS OF GOVERNMENT COLLEGE, UNIVERSITY HYDERABAD, AND SINDH, PAKISTAN ON RHESUS BLOOD GROUP.

FIG: 4. SHOWING COLLECTION OF BLOOD SAMPLES FOR THE DETERMINATION OF BLOOD GROUP AMONG THE PERSONNEL OF GOVERNMENT COLLEGE, UNIVERSITY HYDERABAD, SINDH, PAKISTAN.

The investigation of blood group distribution among contributors at Government College, University Hyderabad, and Sindh, Pakistan revealed occurrence of different blood group types among the community of university. Particularly, blood group (B) was found (35.6%) as the major blood group type in the total of the male and female participants. This predominant blood group among population demonstrated further investigation into the factors that contributing its higher frequency. This frequency suggested that the prevalence of blood group B was not influenced by gender differences among population, further highlighted its importance. In contrast, (AB) blood group demonstrated (9.0%) as the lowest frequency distribution among participants. This prominent difference in distribution provides further investigations into possible fundamental factors that contributing variances in blood groups among persons.

Furthermore, the Rhesus blood group frequency distribution revealed interesting patterns among the university community. In ABO blood group, Rhesus-positive was dominated blood group, (94.84%) of the total participants. This universal presence of Rhesus positivity highlights its prevalence within population and emphasizes its clinical and blood transfusion significance. The Rhesus-negative individuals exhibited remarkably lower frequency as (5.5%) of

the total participants. This frequency of Rhesus negativity among university community highlighted its distinguishing characteristics and emphasized the importance of understanding. Generally, these findings highlighted the significance of blood group frequency distribution in understanding the genetic assortment and health situation within explicit population. The prominent prevalence of blood group (B) and Rhesus positive among university community emphasizes for further investigation to clarify the fundamental factors which are influential for these frequency distributions and their implications for clinical and blood transfusion practices.

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