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PREVALENCE OF O (+VE) BLOOD GROUP OFTHE INDIVIDUALS AT GOVERNMENT COLLEGE UNIVERSITY HYDERABAD

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ABSTRACT

The O (+ve) blood group has a great importance in medical and health contexts. Investigating on the genetic basis, transfusion compatibility. The blood donations especially of O (+ve) as "*Universal Donor*" it traces the position of the (Rh) glimpse a perspective importance in different medical situations. The investigations related to blood group type, discovering vulnerability or confrontation to many illnesses especially those with O (+ve) blood. The objective of current research was to know the occurrence of the gender wise O (+ve) blood-group of individuals at GC University, Hyderabad with implication and importance of any health emerging

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situations, its genetic particulars and frequency among individuals. For this blood group (2023) camp was arranged and during the camp, blood samples were taken in order from tip of the finger capillaries by pricking method to record the blood types. To data was statistically analyzed. The results of current study displayed that the blood group B, was prevalent among individuals (35.6%) and O was about (29%) followed by A (25.5%), and AB (9.5%) (Waleed Alabdulmonem, 2020). Furthermore, out of total blood donors, B (+ ve) positive blood group was found to be highest (32.1%), followed by O (+ ve) positive and (A+ve) positive (25%) (Table.1 and Fig.1 and Fig.2) in comparison of earlier reported results (O-ve) negative (5.45%), (AB+ve) positive (3.4%), (A-ve) negative (2.8%), (B-ve) negative (2.1%) and (AB-ve) negative (0.5%).. Individuals with (B) blood group was somewhat more frequent followed by (A) and (O), while (AB) blood group was the least frequent. Blood group (A) Rh negative factor was recorded more in females 12 (37.5%) followed by (O) blood group 10 (31.3%), blood group B 09 (28.1%) and AB, blood group 01 (3.1%). The (O+ve) positive blood type compatibility must be carefully considered in clinical practice, particularly regarding Rh factor compatibility and potential risks associated with transfusions to Rh-negative recipients. Continued advancements in blood banking and transfusion medicine aim to improve compatibility assessment and enhance patient safety in transfusion therapy and organ transplant.

Key words: Prevalence, O+ Blood group, rarity and frequency, GC University, Hyderabad, Sindh, Pakistan.

Introduction

Blood group is a hereditary its gene passed from parents to offspring. The important types of blood group systems are (ABO) and (Rh) blood group system represents antigen normally positive and negative suffix after the (ABO) type. The term (Rh factor), Rh (+) positive and Rh (-) negative denote to the Rh(D) antigen only. The (ABO) blood group system mainly comprises of four main blood groups and each group have its own importance as an essential donor and recipient during need of transfusions. An individual belongs to the any blood group that depends on the presence of antigens and antibodies in their blood. Antigens a combination of sugar and different types of proteins present on the surface of red blood cells (RBCs) on other side antibodies are the natural defense system and present in the blood of any individual. Transfusion of blood from wrong (ABO) group types can be a life-

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threatening condition. The presence of antigen A and B and matching antibodies determines (ABO) blood group of any individual**.** The Red Cross evident most common blood types in the (USA) in African and Americans 47% (O+) 24% (A+) and (18% (B+) positive, whereas, in Lain Americans 53% (O+), 29% (A+) and 9% (B+) positive, Asians have blood groups 39% (O+) 27% (A+) and 25% (B+) (Rubina, N. *etal.,* 2015) and (Danielle, H. *etal.,* 2024). Worldwide the least common blood group is, no Rh antigens proteins or Rh null in (RBCs) represents golden blood group type (Anita, D. 2022). Earlier research exhibited that the any individual has blood group type (O) are at the low risk level of coronary heart disorders tends to be lower with high life expectancy as other individual have other blood group types have possibility of high level of cholesterol and proteins associated to blood clotting (Mahammad, J. 2022). The blood group type (O+ ve) is a most preferable group of blood transfusions for emergency conditions of patients with unidentified blood groups because of that blood group type (O+ ve) has minimal risk of reactions (Shaziya, A. 2022). All blood groups depend on the phenotype of any individual and express diverse proteins present on the surface of circulatory (RBCs) for recognition by the immune system and this results in four blood group types (A, O, B, and AB). Non-compatible blood group types among individuals during blood transfusion are very harmful for any recipient .The O (+ve) blood group has a great importance in medical and health contexts. Investigating on the genetic basis, transfusion compatibility. The blood donations especially of O (+ve) as universal donor status it traces the position of the Rh factor glimpse a perspective importance in different medical situations. Therefore, current study was carried out to know the occurrence of the gender wise O (+ve) blood group among the individuals of Government College, University, Hyderabad, Sindh, Pakistan with implication and importance of any health emerging situations, its genetic particulars and frequency among individuals.

Methodology

Materials uses in Blood camp: To determine blood group types in a university camp we have typically need the following apparatus:

Blood Typing Trays or Plates: These are special plates or trays containing wells where blood samples are mixed with reagents to determine blood type.

Serum or Reagents: Anti-A, Anti-B, and Anti-Rh antibodies are needed to test for the presence of antigens on red blood cells.

Pipettes: For accurate measurement and transfer of blood samples and reagents.

Agglutination Cards or Slides: Used to observe the agglutination reactions that occur when antigens and antibodies react.

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Blood Lancets or Needles: To obtaining blood samples from participants.

Clean Glass Slides and Coverslips: For preparing blood smears for microscopic examination.

Safety Equipment: Including gloves, goggles, and lab coats to protect against exposure to blood borne pathogens.

Sterile Swabs or Cotton Balls: For cleaning the puncture site before blood collection.

Marker Pens: For labeling samples and trays to avoid confusion.

During current study a total of (200) blood samples were collected during a camp in accordance to established protocols to ensure accuracy and reliability of the results.

Sample Collection

Consent obtained from participants voluntarily from each individual. Blood samples were obtained by trained medical professionals using sterile techniques to minimize contamination and ensure the safety of participants. Each sample was labeled with a unique identifier to maintain anonymity and trackability throughout the study.

Blood Typing Procedure

Blood group types performed at laboratory setting using standard techniques based on antigen-antibody reactions. ABO and Rh blood group systems by testing of presence or absence of A and B antigen on the surface of red blood cells (RBCs). Rh blood group system testing was conducted to identify the Rh antigens on (RBCs) cell membrane.

Data Analysis

Descriptive statistics were used to summarize the distribution of blood types within the sample population, including frequencies and percentages.

Quality Control

Quality control measures were applied to minimize errors and ensure the reliability of the results. Laboratory equipment was calibrated regularly, and reagents were prepared according to standardized protocols to maintain consistency.

Ethical Consideration

The protocol for current study was permitted by the relevant institutional ethics/review committee, and consent was obtained from participants. Confidentiality of participants' personal information and medical data was strictly maintained throughout the study. This summary outlines the systematic approach undertaken to collect and analyze (200) blood samples for blood typing during the camp.

Results and Discussion

As D'Adamo described that individual have blood group type (O) may harmonize diet and dynamic aerobic exercise says with any supplements for associated conditions of

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digestive problems (Jillian, K. 2023). The O (33.8%) blood group types furthermost and AB blood group type was the least common and occurrence of Rh-positive and negative was (88.2%) and (11.8%) respectively (Mohammad, A. *etal.*, 2020). In population of United States of America (USA) comprises of (37%) (O+ ve) positive blood group while Asians have more likely (B) group type. Understanding of (dominant and recessive traits), chromosome arises in pairs have copies of each possible trait to express dominant and recessive (Lizette, 2016).

Positive or negative blood

The antigen (D) in Rh blood group system regulates positive or negative blood group Rh factor and presence of Rh(D) antigen blood expresses positive (+ve) blood group and its absence represents blood type (- ve) negative. In current study out of O blood group types 77% were Rh (D) positive with four other main types of antigens in Rh blood group system.

O+ Blood type

The most critical blood group types (O+ ve) positive and (O-ve) negative blood sustenance patients in hospitals and (O+ve) positive blood group always essential and used frequently in hospitals**.** The donors with blood group (O+ve) positive have (35%) blood group type donors (A+ve) positives have (30%), while (AB-ve) negative (1%).

Any individual blood group (A, B, AB and O) have Rh (+) positive blood group may receive (O+ve) positive blood group which benefits around 76% of the population. The compatibility of O positive blood type is an essential aspect in blood transfusions and organ transplantation. The (O+ve) positive blood group type referred as a "universal donor" blood group type because red blood cells (RBCs) to recipients with any Rh-positive blood types *i.e.*, (A+ve positive, B+ve positive, AB+ve positive, and O+ve positive). This universal donor status is due to the absence of antigen (A and B) on the surface of red blood cells (RBCs), making O positive blood less likely to trigger immune reactions in recipients.

O positive blood type contains the Rh antigen, making it compatible with Rh-positive blood types for both transfusions and organ donations. However, Rh factor compatibility also crucial, particularly for pregnant women, as Rh factor in-compatibility between fetus and her mother may lead to hemolytic disorders in newborn babies.

While O positive blood can be transfused to individuals with other Rh-positive blood types, compatibility issues may arise when transfusing to Rh-negative recipients. Incompatibility reactions, such as hemolytic transfusion reactions, can occur if Rh-positive blood is transfused to and Rh-negative recipient due to the presence of anti-Rh antibodies in the recipient's blood.

Individuals with O positive blood type who receive Rh-positive blood transfusions are at risk of developing Rh sensitization, whereby their immune system produces antibodies against the Rh antigen. Rh sensitization can pose challenges for future blood transfusions or pregnancies, as it may lead to hemolytic transfusion reactions or hemolytic disease of the newborn in Rh-negative pregnant women.

The results of current study displayed that the blood group B, was prevalent among

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Table # 1: Shows (ABO) blood group wise among the individuals of Government College, University, Hyderabad, Sindh, Pakistan

Blood Type	Female	Male	Total	Percentage
A+	33	18	51	25%
A-	1	00	1	0.5%
AB+	10	08	18	9.0%
AB-	1	00	1	0.5%
B+	44	20	64	32.1%
B-	4	03	7	3.5%
O+	39	16	55	27.6%
O-	1	1	2	1.0%

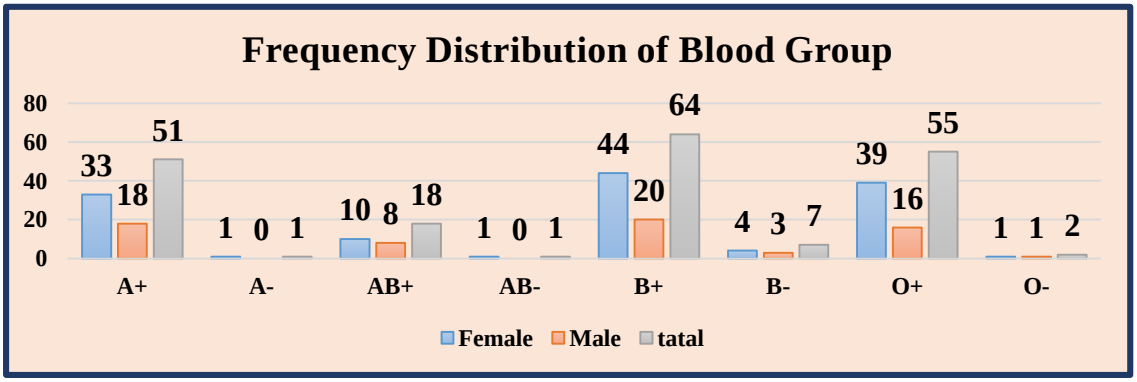


Fig No. 1: This graph showing the percentage of each male and female positive and negative blood groups in total samples.

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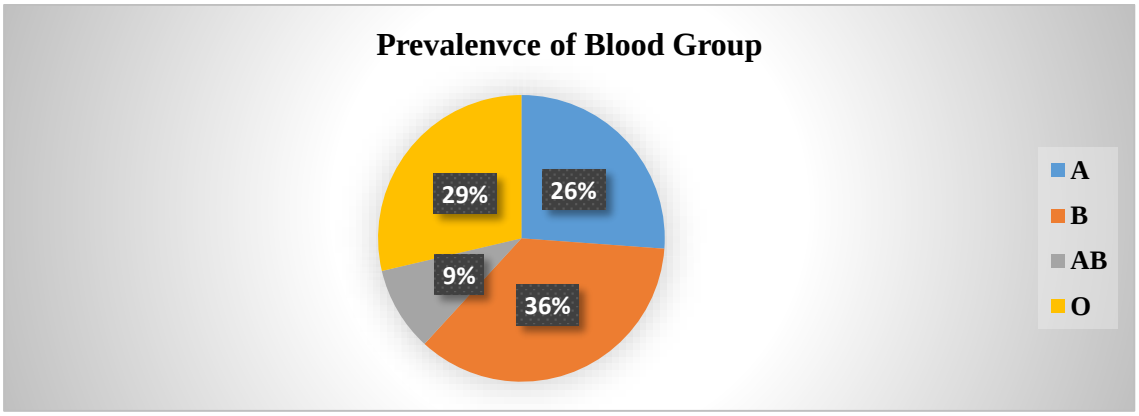


Fig No 2: This pie chart showing the percentage results of ABO blood group system.



Photograph # 1: Showing that collection of Blood Samples during the Blood Group Camp at Govenment College University, Hyderabad, Sindh, Pakistan



Photograph:2. Collection of Blood samples for examine the types of blood groups among individuals of Government College University, Hyderabad, Sindh, Pakistan

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Precautions and Considerations

It is essential that health-care providers carefully cross match compatibility of blood group types and Rh factors of blood donors and recipients to curtail the life-threatening risk and adverse reactions before blood transfusions or organ transplantation. Advanced testing techniques, such as cross-matching and antibody screening, are used to ensure compatibility and prevent transfusion reactions in clinical settings.

Conclusion

Despite being the universal donor for Rh-positive blood types, O positive blood type compatibility must be carefully considered in clinical practice, particularly regarding Rh factor compatibility and potential risks associated with transfusions to Rh-negative recipients. Continued advancements in blood banking and transfusion medicine aim to improve compatibility assessment and enhance patient safety in transfusion therapy and organ transplant**.**

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