Dr. BRR GOVERNMENT DEGREE COLLEGE
JADCHERLA– 509301
(Accredited with B^{++} by NAAC)

Dr.CH.AppiyaChinnamma, M.Sc., Ph.D.
Principal

Department of Zoology

Dr.BRR Government College Jadcherla

Student Study Project

On

"Identification of Blood groups among the students of Dr.BRR Government Degree College Jadcherla"

Academic Year 2021-22

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The department of Zoology has conducted student study projects during the academic year 2021-22

Title: **"Identification of Blood groups among the students of Dr.BRR Government Degree College jadcherla"**

Place of Work: Dr.BRR Government Degree College Jadcherla T.S

Members of The Group Project:

1. M.Deepika B.Sc (MZC) II year 20033006457017
2. K.Raghavender B.Sc., (MZC) II year 20033006457013
3. K.Vineetha Bai B.Sc., (MZC) II year 20033006457012
4. M.Tharun B.Sc., (MZC) II year 20033006457016
5. K.Jyothi B.Sc., (MZC) II year 20033006457011
6. J.J.Lidya Rose B.Sc., (MZC) II year 20033006457010
7. B.Swetha B.Sc., (MZC) II year 20033006457003

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A Group Project On

Title: "Identification of Blood groups among the students of Dr.BRR Government Degree College jadcherla"

By

1. M.Deepika	B.Sc (MZC) II year 20033006457017	
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5.K.Jyothi	B.Sc., (MZC) II year 20033006457011	Jyothi
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Supervised By
K.Neeraja,Asst.Professor of Zoology

Supervisor **In-Charge of the Department** **Principal**

PRINCIPAL
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Student Study Project Certificate

CERTIFICATE

This to certify that,the project work Title: **"Identification of Blood groups among the students of Dr.BRR Government Degree College jadcherla"** is a bonafideworkdone by M.Deepika,, K.Raghavender, K.Vineetha Bai, M.Tharun, K.Jyothi, J.J.Lidya Rose and B.Swetha the students of B.Sc (BZC) IV semester under my supervision in Zoology at the Department of Zoology Dr.BRR Government Degree College Jadcherla during the academic year 2021-22 and the work has not been submitted to any other college or university either par or full for the award of any degree.

Place: Jadcherla

Date:

K.Neeraja
Asst,Prof,of Zoology

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Finally thanks are also due to K.Neeraja for guiding the team to during period the project.

Objectives:

To Promote interest in research aptitude among students

To promote the concept of Sustainable Environment

To preserve the natural composition of Environment

To know the role of Humans in causing Pollution

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SUPERVISED BY

K.NEERAJA, LECTURER IN ZOOLOGY

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We are thankful to sri B.Ravinder Rao H.O.D Zoology, smt.k.Subhashini asst. prof. of Zoology for their encouragement.

We pay thanks to all the students who participated in the survey.

ABSTRACT

International Society of Blood Transfusion has recently recognized 33 blood group systems. Apart from ABO and Rhesus system, many other types of antigens have been noticed on the red cell membranes. Blood grouping and cross-matching is one of the few important tests that the anaesthesiologist orders during perioperative period. Hence, a proper understanding of the blood group system, their clinical significance, typing and cross-matching tests, and current perspective are of paramount importance to prevent transfusion-related complications. Nonetheless, the knowledge on blood group system is necessary to approach blood group-linked diseases which are still at the stage of research. The study conducted from July 2021 to August 2021 and the results showed that B+ blood group is predominant with 39% followed by AB+ 37%, A+, 14% , O+ 6%,AB- 2% A-1% and o- is not represented in this selected group of students.Overall Rh Positive individuals are 97% and Rh Negative individuals are 3%.

This review addresses all these aspects of the blood groups system.

Keywords: ABO blood groups, antibody typing, blood group system, rhesus blood group, screening

INTRODUCTION

The term "blood group" refers to the entire blood group system comprising red blood cell (RBC) antigens whose specificity is controlled by a series of genes which can be allelic or linked very closely on the same chromosome. "Blood type" refers to a specific pattern of reaction to testing antisera within a given system. Over a period of time, our understanding on blood groups has evolved to encompass not only transfusion-related problems but also specific disease association with RBC surface antigens. Karl Landsteiner has been credited for the discovery of ABO blood group system in 1900His

extensive research on serology based on simple but strong scientific reasoning led to identification of major blood groups such as O, A, and B types, compatibility testing, and subsequent transfusion practices. He was awarded Noble Prize in 1930 for this discovery. His obituary lists an immense contribution of more than 346 publications. Later, Jan Jansky described classification of human blood groups of four types.

BLOOD GROUPS

At present, 33 blood group systems representing over 300 antigens are listed by the International Society of Blood Transfusion. Most of them have been cloned and sequenced. The genes of these blood group systems are autosomal, except XG and XK which are X-borne, and MIC2 which is present on both X and Y chromosomes. The antigens can be integral proteins where polymorphisms lie in the variation of amino acid sequence (e.g., rhesus [Rh], Kill), glycoprotein's or glycolipids (e.g., ABO).

Rh- Factor

Rhesus-system is the second most important blood group system after ABO. Currently, the Rh-system consists of 50 defined blood group antigens out of which only five are important. RBC surface of an individual may or may not have a Rh factor or immunogenic D-antigen. Accordingly, the status is indicated as either Rh-positive (D-antigen present) or Rh-negative (D-antigen absent). In contrast to the ABO system, anti-Rh antibodies are, normally, not present in the blood of individuals with D-negative RBCs, unless the circulatory system of these individuals has been exposed to D-positive RBCs. These immune antibodies are immunoglobulin G (IgG) in nature and hence, can cross the placenta. Prophylaxis is given against Rh immunization using anti-D Ig for pregnant Rh-negative mothers who have given birth to Rh-positive child.

Blood groups and disease association

The ABO blood groups have a profound influence on haemostasis. They exert major quantitative effects on plasma levels of von Willebrand factor and factor VIII. Increased association of myocardial infarction, ischemic stroke, and venous thromboembolism is seen with blood groups A and AB possibly through functional ABO glycol transferases modulation of thrombosis. A higher risk of cerebral venous thrombosis has been reported in non-O groups. Significant association of ABO groups with the prevalence of

preeclampsia has been reported, where AB group was found to be associated with an increased risk of 2.1-folds.Preliminary studies suggested an association of ABO system with malignancies. A positive correlation has been shown between blood group A with chronic hepatitis-B infection and pancreatic cancer. and blood group B with ovarian cancer. Protection against falciparum malaria can be achieved with group O by reducing rosette formation. Blood group O increases the severity of infection in Vibrio cholerae strains (O1 El Tor and O139).

BLOOD REQUISITION

After the decision to transfuse blood is taken the next step should be to order a requisition during which the following steps need to be remembered.

Blood grouping and cross-matching

The most fatal of all transfusion-related reaction is ABO incompatibility causing complement-mediated intravascular hemolysis. Hence, correct blood grouping and typing, and cross-checking with the blood requisition form is of utmost importance. ABO typing is carried out by testing RBCs for the A and B antigens and the serum for the A and B antibodies before transfusion. The next step involves Rh typing with only 15% of the population being Rh-negative.

Cross-matching

Cross-matching involves mixing of donor RBCs with the recipient serum to detect fatal reactions. It has three phases in which the first phase (1-5 min) involves detection of ABO incompatibility and detection of antibody against MN, P, and Lewis systems. The second phase (30-45 min in albumin and 10-20 min in low ionic salt solution) involves incubation of first phase reactants at 37°C for detection of incomplete antibodies of Rh system. The third phase consists of the addition of antiglobulin sera to the incubated second phase reactants to detect incomplete antibodies of Rh, Kidd, Kell and Duffy. Among the three phases, the first two phases are more important as they detect those involved in fatal HTR. The total time taken for all the three phases is in between 45 and 60 min.

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Antibody screening

Here, commercially prepared RBCs with all the antigens, which direct production of antibodies causing hemolytic reactions, are mixed with the recipient's serum to detect the presence of those very antibodies. It is also carried out with the donor's serum.

Benefits of blood transfusion

Blood transfusion can save a patient's life and limit the complications of severe blood loss.

- A lot of bleeding can lead to a seriously low hemoglobin level and cause damage to body organs due to a lack of oxygen.
- If bleeding continues the body's supply of platelets and plasma are also decreased. Then, blood cannot clot and bleeding will not stop.

Blood transfusion benefits patients by treating or preventing these situations.

Risks of blood transfusion:

Canada's blood supply is one of the safest in the world but blood can never be risk-free. In Canada, the risk of transfusion-transmitted disease for each unit of blood is:

- HIV (AIDS) about 1 in 21.4 million
- Hepatitis C about 1 in 12.6 million
- Hepatitis B about 1 in 7.5 million

Other risks of blood transfusion are:

- Hemolytic reactions: the patient's own blood destroys the transfused blood. This is due to a human error. Careful patient identification steps are followed to make sure the correct blood is given.
- Bacterial infection (highest with platelet transfusions).

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Side-effects could include: itching, skin rash, fever, or feeling cold. More serious side effects such as trouble breathing are very rare.

Blood transfusions are very carefully matched to the patient's blood type but transfused blood is not identical to your blood. Transfused blood can also have effects on your immune system.

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Fig.1:Group members collecting the blood and testing the blood group of students of Dr.BRR Government Degree College Jadcherla.

Table.1: Number of persons with their blood group

A+	A-	B+	B-	O+	O-	AB+	AB-	TOTAL
14	1	39	1	37	0	6	2	100

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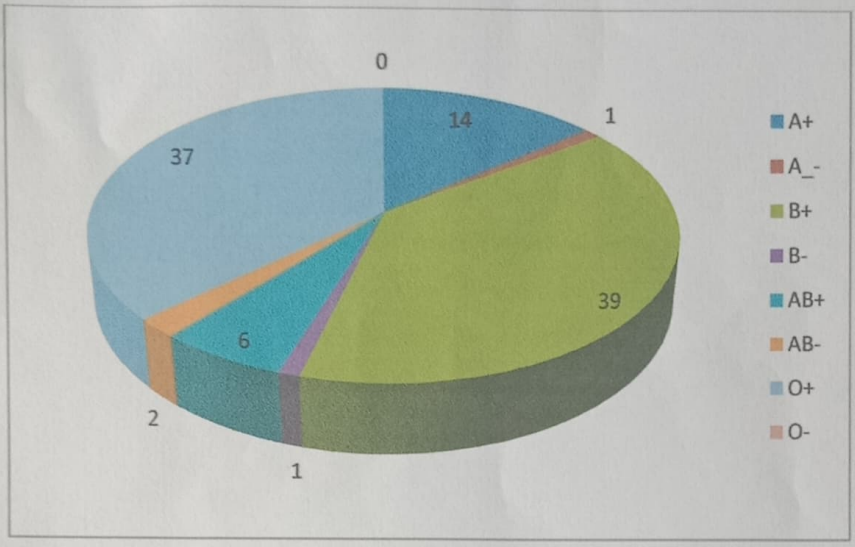

Fig'2: Graph showing distribution of Blood Groups among the students of Dr.BRR GDC Jadcherla

Results:

In the present study 100 samples have been collected from the students of Dr.BRR Government Degree College Jadcherla, the results showed that B+ blood group is predominant with 39% followed by AB+ 37%, A+, 14% , O+ 6%,AB- 2% A-1% and o- is not represented in this selected group of students.Overall Rh Positive individuals are 97% and Rh Negative individuals are 3%.

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