

PERCENTAGE DISTRIBUTION OF ABO AND RHESUS BLOOD GROUPS: A CONCRETE STUDY IN PRAKASAM DISTRICT OF ANDHRA PRADESHBora Prasada Rao¹, G. Durga Devi²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND: ABO and Rh System are the major blood Groups widely distributed in the general population irrespective of their race, ethnicity and geographical distribution. The present study is conducted to identify the distribution of these commonest blood groups prevailing in the Prakasam District of Andhra Pradesh in comparison with related studies in India and abroad. About 2404 samples over a period of 4 months from November 2014 to February 2015, grouped for ABO and Rh-D System(s) at Blood Bank, RIMS, Ongole, Prakasam district Andhra Pradesh. **METHODS:** Ongole is the capital of erstwhile Andhra Pradesh; it is very near to the present proposed capital of Andhra Pradesh. The present study was conducted in human male and female subjects comprising of 2404 attendees to the RIMS Medical College Blood Bank of Prakasam District over a period of 4 months. All the standardized Operating Procedures (SOPs) and Quality Control measures are taken for blood group determination including Donor Screening Questionnaire. Subjects with severe medical problems like Cardio respiratory, renal, hepatic and gastrointestinal illnesses were excluded from the study. **RESULTS:** In the present study in Prakasam district, the most common Blood Group in ABO and Rh system was found to be 'O' +ve. Next common in descending order were B+ve, A+ve, AB+ve, O-ve, A-ve, B-ve and AB-ve. In Prakasam District, the commonest Rh Blood type is Rh Positive (94.5%), less frequent is Rh negative (5.5%). In South India Rh Positive is 94.6%, Rh negative is 5.4%. In European Population Rh Positive is 85% and Rh negative is 15%. Of the total 60 people affected by diseases, 4 were affected by HIV, 40 by HBSAG and 16 by HCV. **CONCLUSION:** It is clearly evident that the most common Blood Group in ABO system is 'O'. Least common Blood Group is AB. In Rh system D Positive is 94.5% in general population.

KEYWORDS: Blood groups, ABO, Rhesus system, Hemo Cue method.

INTRODUCTION: There are more than 30 Blood Group systems containing about 400 antigens. Fortunately, most of these antigens are not significant immunologically, moreover, many of them have cold antibodies that do not react with body temperature. The antigens that are involved in Blood Groups are called agglutinogens and the antibodies that are produced against these antigens are called agglutinins. Clinically important Blood Groups are the (1) ABO system (2) Rh System.

The ABO⁽¹⁻⁵⁾ system is the most important Blood Group system because of the 'A' and 'B' Antibodies in the individuals from birth who lack corresponding antigen in their Red Cells. In addition, transfusion of incompatible 'ABO' Blood groups immediately leads to serious consequences. Based on the presence and absence of 'A' and 'B' antigens four blood Groups are classified:

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Blood Group	Antigen Present (Agglutinogens)
Group A	A
Group B	B
Group AB	AB
Group O	Neither A nor B present

The Rh (Rhesus) System⁽⁶⁻⁹⁾ was first discovered in Rhesus Monkeys, hence it is called 'Rh' system. In this system there are six antigens, but there are no naturally occurring antibodies. The antigens are C D E, c, d, and e. The 'D' antigen is the most significant. Therefore the 'Rh' system has two blood groups i.e. 'Rh' positive and 'Rh' negative. It is observed that in Indian population 95-95% have 'Rh' Positivity and 2-5% have 'Rh' Negativity.

Blood and its disorders are the most frequent physician seeking ailments regionally and globally. In view of the above, the constantly changing disease pattern from non-infectious to infectious and advanced genetic and acquired blood malignancies regionally has motivated me to determine the major blood Group distribution in Prakasam District. The present study will help in collection of blood from donors in relation to frequency distribution of local blood groups in Prakasam district and for storage of appropriate units of blood in advance in blood banks for emergency conditions of the patients.

MATERIALS AND METHODS: The present study was conducted in human male and female subjects comprising of 2404 attendees to the RIMS Medical College Blood Bank of Prakasam district. Subjects with severe medical problems like Cardiorespiratory, renal, hepatic and gastrointestinal illnesses were excluded from the study. All were informed about the test protocol and written consent was obtained.

All were instructed to attend the prior informed Blood Donor Camps at various places after taking light breakfast and are examined between 9 AM and 12 Noon. A consent form has been designed and all the necessary information like their daily habits, past medical information, diseases they suffered from etc. were collected.

The Protocol is as follows-The Standard Operating Procedures are followed for the below mentioned parameters. Blood group determination was done with all universal precautions and aseptic precautions in the subjects between the age groups of 18-60 years:

- Assessing suitability of donor for Blood donation.
- Physical Examination of the donor.
- Method of Estimation of Donor's haemoglobin by Hemo Cue Method.
- Solutions and Methods for Preparing Phlebotomy Site Assessing Suitability of Donor for Blood Donation.
- Post Donation Care.
- Management of Adverse Reactions in the Donor.
- Method of Accurately Relating Product to Donor.
- Cell and Serum Testing by Tube Method.
- Rh (D) Testing by Tube Method.
- Sample Tested for D^u Testing by Tube Method.

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- To prepare RBC Suspension of Appropriate Concentration for a Given Test.
- Daily Quality Control of ABO & Rh Blood Group Reagents.
- Detection of Unexpected Blood Group Antibodies.
- Saline/ Albumin/ Enzyme Cross Matching.
- Detection of Incompatibilities caused by Warm Complete Antibodies.
- Sample tested for LISS Coomb's by ID Card Method.

MATERIALS: The Materials required for the study are weighing scale, Sphygmomanometer, Clinical thermometer, Hemo Cue, Capillaries, Lancet, Donor card.

MEDICAL EXAMINATION: Assessing the suitability of donor for Blood donation (Donor Questionnaire) and Physical Examination of the donor.

GENERAL APPEARANCE: (EXCLUSION CRITERIA)

- A donor who appears ill, under the influence of drugs/alcohol or does not appear to be providing reliable answers to medical history.
- Check and enter donor's weight. The weight shall be ≥ 50 kg in respect of male and ≥ 45 kg in respect of female. To collect 450 ml the donor weight must be above 55kg and 45 to 50 kg for both to collect 350ml blood.
- The Donor weight is determined in light clothing without shoes on a weighing machine, measuring scale calibrated for the purpose.
- Check if the blood pressure, pulse and temperature of the donor are within the acceptable limits:
- Blood Pressure was measured in the sitting posture after 10 minutes of rest using appropriate cuff of rest using appropriate cuff with mercury sphygmomanometer.
 - Systolic blood pressure not > 160 mm of Hg.
 - Diastolic pressure not > 1 - mm of Hg;
 - Pulse regular, between 60 and 72 beats/ minute.
 - Oral temperature $37.5\text{ C} \pm 0.2\text{C}$ ($98.6\text{F} \pm 0.5\text{F}$).

Method of Estimation of Donor's Haemoglobin by Hemo Cue Method ⁽¹⁰⁻¹³⁾:



Fig.1: The Hemo Cue Method

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MATERIALS: Sterilising tray, Demethylated Spirit, Povidone Iodine, Cotton/ Gauze/ Swabs, Artery forceps, Tourniquet, Savlon. The procedure followed is - After selection of the vein for venipuncture, Savlon, Povidone-iodine is applied and finally Spirit swab, in this order, to the skin at the phlebotomy site. Disinfection of the skin of about an area of 5 cm diameter from the centre to outwards in a circular motion is started. The Povidone-iodine is scrubbed vigorously for at least 30 seconds or till froth forms. Do not touch the site prepared for venipuncture.

Should it be necessary, touch the skin away from the point of needle insertion. If the puncture site is touched, repeat skin preparation procedure as detailed earlier. Discreetly check the used swab. If it is physically soiled/contaminated, take a new swab and repeat skin preparation procedure as detailed earlier. Dispose of used swab(s) into a waste bin meant for bio-hazardous materials. Allow the skin to air dry. Do not wipe the area with cotton wool, fan or blow on it.

RESULTS: The blood samples were collected from various camps, some of which include RIMS Ongole, RTO office, MDO office, RISE RTC, PACE Engineering, Reddy's hostel, NTR Jayanthi, Police training schools, Government schools, Gowthami Colleges, Satyasai seva trust etc. The subjects were from different places located in Prakasam district which are presented in the table below. Around 2404 samples were taken into study and are grouped into various blood groups.

Place	Samples	A+ve	B+ve	O+ve	AB+ve	A-ve	B-ve	O-ve	AB-ve
Ongole	1491	304	428	611	71	18	15	38	06
Kandukururu	235	39	83	85	11	05	05	06	01
S N Padu	58	14	17	19	05	-	02	01	-
Chimakurty	57	17	15	17	03	-	-	05	-
Pelluru	42	10	13	16	03	-	-	-	-
Maddipadu	22	04	05	10	03	-	-	-	-
Pamidipadu	21	08	03	08	02	-	-	-	-
Mederemetla	54	05	23	16	03	02	02	02	01
Uvlavapadu	87	16	20	43	03	-	-	04	01
S N Konda	163	38	45	68	05	01	03	03	-
Podili	115	22	25	53	07	03	01	03	01
Immasamudram	18	04	07	03	03	-	-	01	-
Ethamkula	07	02	02	02	-	-	-	01	-
Darsi	34	08	12	10	02	-	-	02	-
Total	2404	491	698	961	121	29	28	66	10

Table 1: Distribution of various blood groups in different places located in the Prakasam District.

From all the subjects under consideration, few were affected by HIV, HBSAG and HCV and the details of it are as follows:

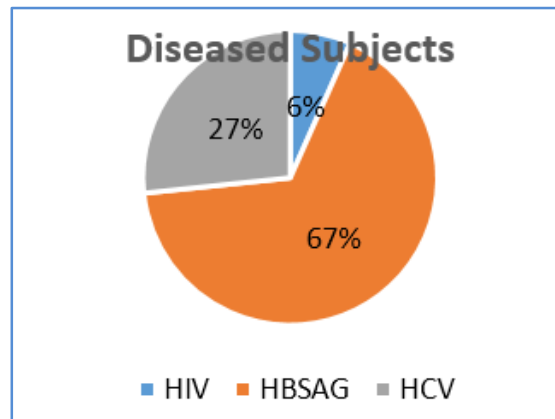


Fig. 2: Distribution of Various Diseases found in the subjects

Of the total 60 people affected by diseases, 4 were affected by HIV, 40 by HBSAG and 16 by HCV.

DISCUSSION: Blood Donor and recipient should know his or her blood group. This may be required in many Medical emergencies. Evolution of Haemolytic disease of new born, clearing disputes of paternity/maternity, forensic and medico legal importance.

In the present study in Prakasam district, the most common Blood Group in ABO and Rh system was found to be 'O' +ve. Next common in descending order were B+ve, A+ve, AB+ve, O-ve, A-ve, B-ve and AB-ve.

In the present study the most common blood group was determined to be 'O' and 'B'. In South India, Blood Group 'O' is the commonest and followed by B. In North India, the 'B' group is commonest. The most common group in Saudi Arabia is 'O' and 'A'. In Iranian Studies, the most common group is 'O'. In Australia, the commonest groups are 'O' and 'A'. The most uncommon Blood group in the present study is 'AB', in Prakasam District. In Andhra Pradesh the most uncommon Blood group is 'AB'.

In the present study in Prakasam District, the commonest Rh Blood type is Rh Positive (94.5%), less frequent is Rh negative (5.5%). In South India Rh Positive is 94.6%, Rh negative is 5.4%. In European Population Rh Positive is 85% and Rh negative is 15%.

CONCLUSION: The most common Blood Group in ABO system was found to be 'O'. Least common Blood Group is AB. In Rh system D Positive is 94.5% in general population.

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