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Prevalence Of Blood Groups In The Anakapalli District Of Andhra Pradesh State.

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Abstract

Introduction: The incidence and prevalence of blood groups varies markedly in different parts of India. Awareness about blood group distribution is useful in emergency blood transfusion necessities. It is also useful for parental testing, legal medicine and population genetic studies
Material and Methods: The study was conducted in Department of Zoology, SGA Govt. Degree College, Yellamanchili, Anakapalli District, Andhra Pradesh state.
Results: The study revealed that the commonest bloodgroup was O (44 %) followed by B(30.75 %), A(21.5 %) and AB (3.75 %)
Conclusion: The most common blood group in our donors was O positive(42.75 %) and the least common was AB negative**.**

INTRODUCTION

Karl Landsteiner in 1901 discovered the first human blood grouping, which was the ABO group (ISBT Committee on Terminology for Red Cell Surface Antigens, 2009). Another important advance came in 1939-40 when Karl Landsteiner, Alex Wiener, Philip Levine, and R E Stetson discovered the Rhesus blood group system, which was found to be the cause of the majority of transfusion reactions up to that time (Harvey, 2005). Knowledge regarding the frequency of red blood cell antigen phenotypes in a population can be helpful in the creation of a donor data bank for the preparation of indigenous cell panels and for providing antigen-negative compatible blood to patients with multiple alloantibodies (Agarwal etal. 2013).

Transfusion of ABO-incompatible blood can be associated with acute intravascular hemolysis, renal failure, and even death. Likewise, transplantation of ABO-incompatible organs is associated with acute humoral rejection. The ABO system consists of four major ABO phenotypes: A, B, O, and AB which are determined by the presence or absence of two antigens (A and B) on red cells. An inverse reciprocal relationship exists between the presence of A and/or B antigens on red cells and the presence of anti-A, anti-B, or both, in sera.
Rhesus (Rh) is another important blood group system after ABO in transfusion medicine and among more than 55 Rh antigens known, D antigen is the most potent one. It is the presence or absence of the D antigen that makes an individual Rh D positive and Rh D negative respectively.
Therefore, it is prudent to carry out a study on the distribution of ABO and Rh phenotypes in Anakapalli district of Andhra Pradesh State as to stock adequate number of respective blood group units and provide timely and adequate blood supply to the needy recipient in the district.
We carried out this study to assess the distribution of ABO and Rh D blood groups at Govt. Degree College, Yellamanchili as the college have more than 600 students and those students are from different mandals of the newly formed district i.e. Anakapalli district.

MATERIAL & METHODS

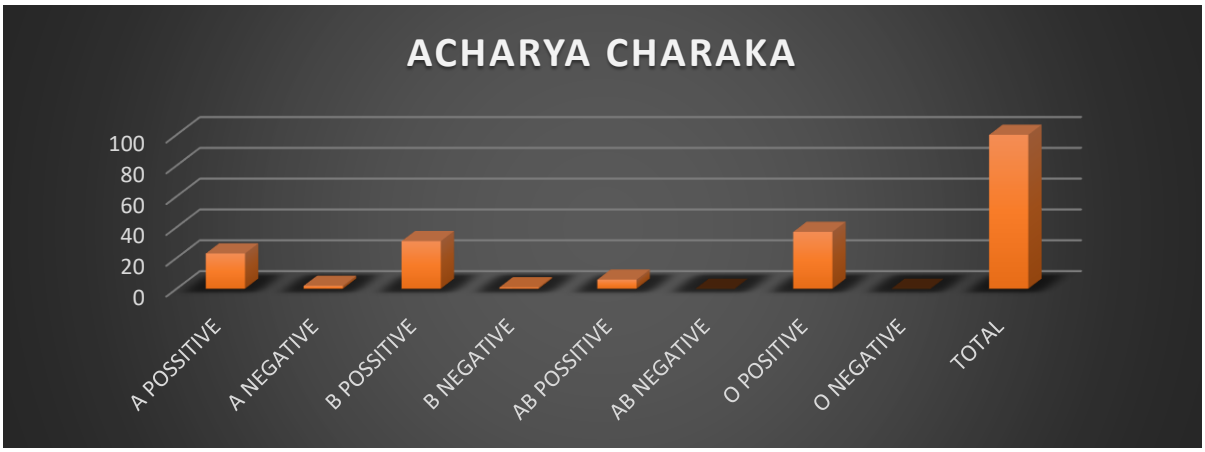
As the SGA Govt Degree college, Yellamanchili have more than 600 students and all the students are coming from the different mandals of the newly formed Anakapalli district we believed that if we take the samples of the students and identify the blood groups, we can expect the broad incidence of the population of the blood groups of the entire district. The B.Sc (BZC) students are conducted a project work to analyze the blood group pattern in all the students of the college under the guidance of the Department of Zoology of SGA Govt. Degree College, Yellamanchili. To get the technical skills on blood group determination the participants were attended a training programme at Surya Medical Lab Yellamanchili for one week period. For conducting the project, the students formed into four groups in the name of the ACHARYA CHARAKA, ACHARYA SHSHRUTHA, ACHARYA KAPILA, ACHARYA PATANJALI to conduct the project.
The project work was carried out from 2022 March 29 to 2022 April 4th and concluded their results in group wise and also according to the entire college wise. Data on distribution pattern of ABO and Rh blood groups were reported in simple percentages. The blood group data were recorded in specially made proforma, tabulated and then analysis was

done for comparing with similar studies by other authors.
After blood donation, ABO grouping and Rh typing was done by antigen antibody slide agglutination test by commercially available standard anti-seras of anti A, anti B and Anti D of Spanclone agglutination antisera and Mediclone Biotech pvt. Ltd.
Total 400 donors were accepted for blood donation during the study period. The donor selection criteria were aged between 18-60 years, weight more than 45 Kgs and hemoglobin content greater than 12.5gm/dl. Blood pressure, pulse rate, condition heart and liver are normal. They must have not suffered from any major ailments like jaundice, malaria in the recent past. They didn't donated blood for the last 3 months.

RESULTS

TABLE 1
RESULTS OF ACHARYA CHARAKA

SL NO	BLOOD GROUP	BLOOD GROUPS IN FEMALE	%	BLOOD GROUPS IN MALE	%	TOTAL NO. OF PERSONS	PERCENTAGE
1	A POSSITIVE	14	24.13%	9	21.42%	23	23
2	A NEGATIVE	1	1.72%	1	2.38%	2	2
3	B POSSITIVE	15	25.86%	16	38.09%	31	31
4	B NEGATIVE	0	0	1	2.38%	1	1
5	AB POSSITIVE	4	6.89%	2	4.76%	6	6
6	AB NEGATIVE	0	0	0	0	0	0
7	O POSITIVE	24	41.37%	13	30.95%	37	37
8	O NEGATIVE	0	0		0	0	0
	TOTAL	58	100%	42	100%	100	100



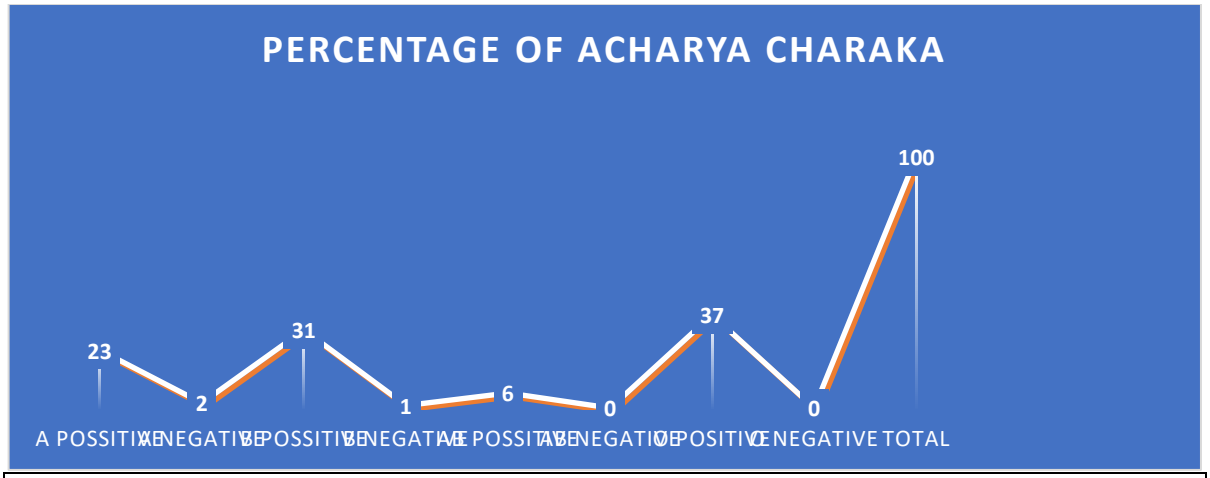
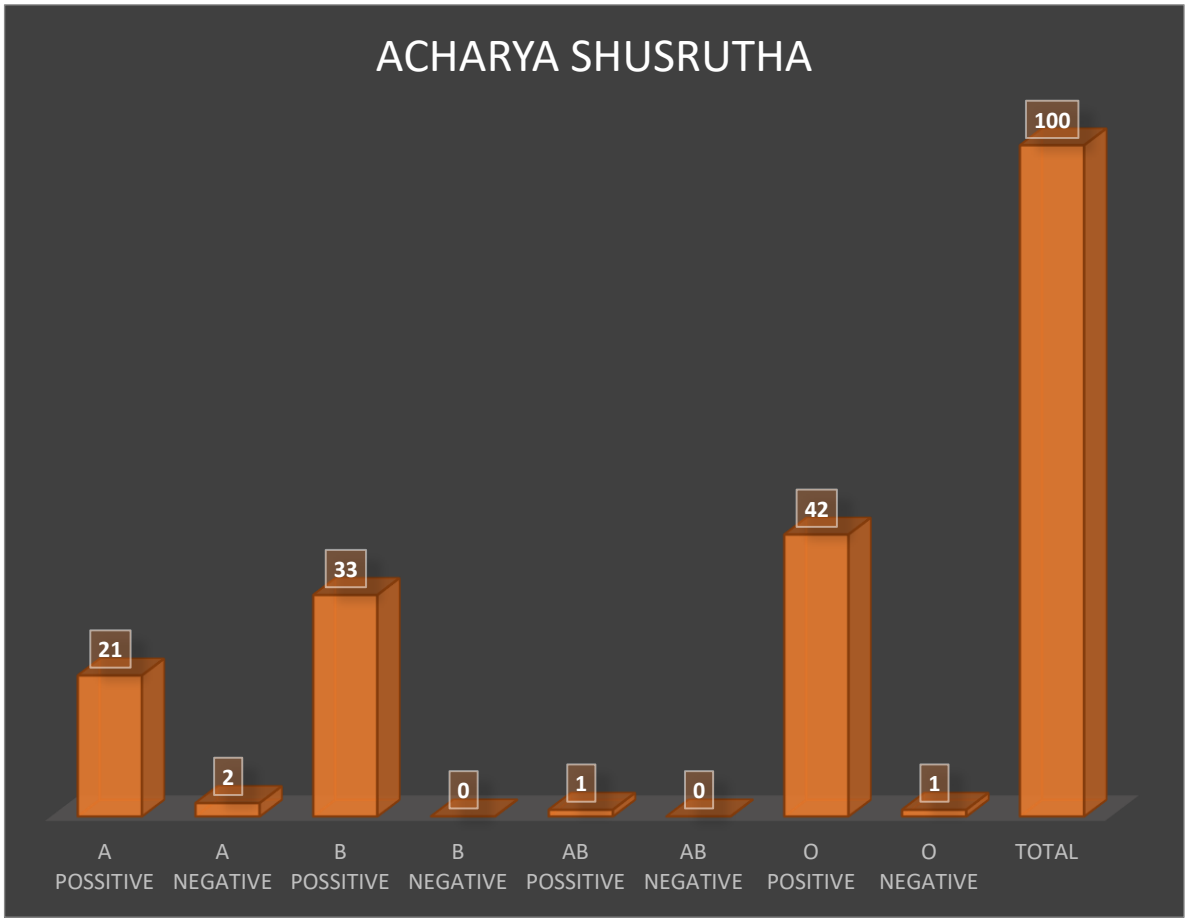


TABLE 2
RESULTS OF ACHARYA CHARAKA

DETAILS OF RH FACTOR						
	BLOOD GROUPS OF FEMALE	FEMALE PERCEN TAGE	BLOOD GROUPS OF MALE	MALE PERCEN TAGE	NO. OF PERSONS	PERCEN TAGE
POSITIVE	57	98.27%	40	95.23%	97	97%
NEGATIVE	1	1.72%	2	4.76%	3	3%
TOTAL	58	100%	42	100%	100	100%

TABLE 3							
RESULTS OF ACHARYA SUSHRUTHA							
SL. NO	BLOOD GROUP	BLOOD GROUPS IN FEMALE	PERCENT AGE IN FEMALE	BLOOD GROUPS IN MALE	PERCENTA GE IN MALE	TOTAL NO. OF PERSONS	PERCENT AGE
1	A POSSITIVE	14	2O%	7	23.33%	21	21
2	A NEGATIVE	2	2.85%	0	0%	2	2
3	B POSSITIVE	23	32.85%	10	33.33%	33	33
4	B NEGATIVE	0	0	0	0%	0	0
5	AB POSSITIVE	1	1.42%	0	0%	1	1
6	AB NEGATIVE	0	0	0	0%	0	0
7	O POSITIVE	29	41.42%	13	43.33%	42	42
8	O NEGATIVE	1	1.42%	0	0%	1	1
	TOTAL	70	100%	30	100%	100	100



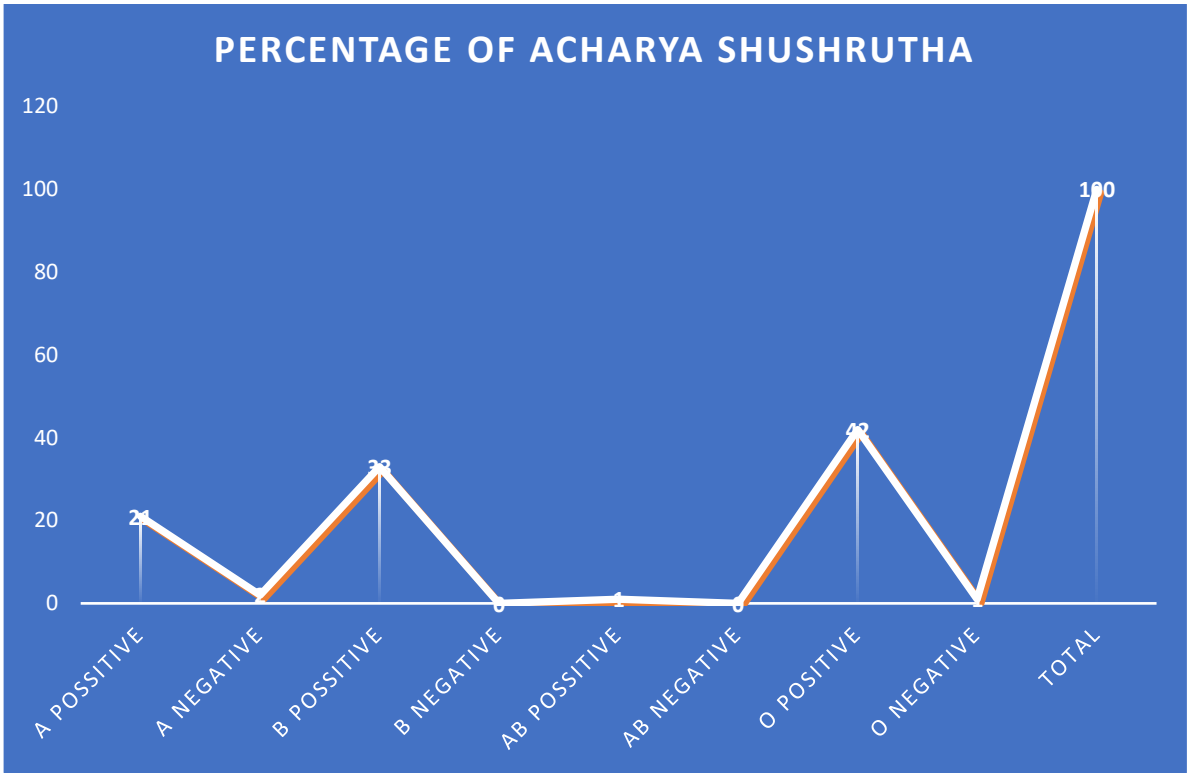


TABLE 4						
RESULTS OF ACHARYA SHUSHRUTHA						
DETAILS OF RH FACTOR						
	FEMALE	FEMALE PERCENTAGE	MALE	MALE PERCEN TAGE	NO. OF PERSONS	PERCEN TAGE
POSITIVE	67	95.71%	30	100%	97	97%
NEGATIVE	3	4.28%	0	0%	3	3%
TOTAL	70	100	30	100%	100	100%

TABLE 5							
RESULTS OF ACHARYA KAPILA							
SL. NO	BLOOD GROUP	BLOOD GROUPS IN FEMALE	PERCENT AGE	BLOOD GROUPS IN MALE	PERCENT AGE	NO. OF PERSONS	PERCEN TAGE
1	A POSSITIVE	12	16.43%	7	25.92%	19	19%
2	A NEGATIVE	1	1.36%	1	3.70%	2	2%
3	B POSSITIVE	22	30.13%	2	7.40%	24	24%
4	B NEGATIVE	0	0%	0	0%	0	0%
5	AB POSSITIVE	2	2.73%	1	3.70%	3	3%
6	AB NEGATIVE	0	0%	0	0%	0	0%
7	O POSITIVE	34	46.57%	16	59.25%	50	50%
8	O NEGATIVE	2	2.73%	0	0%	2	2%
	TOTAL	73	100%	27	100%	100	100%

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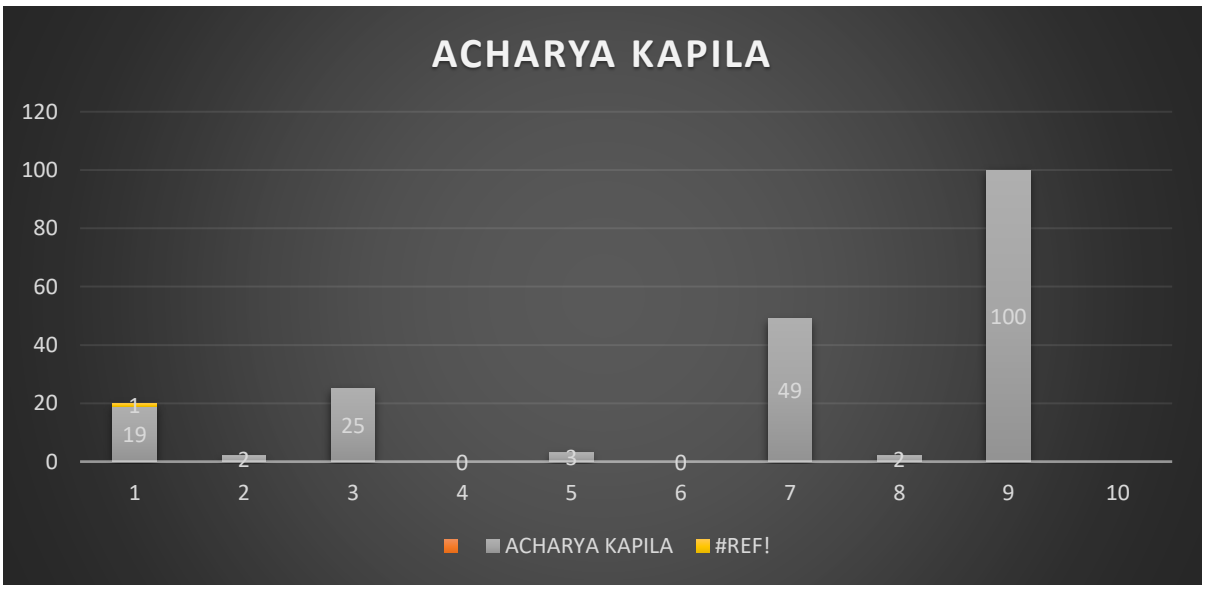


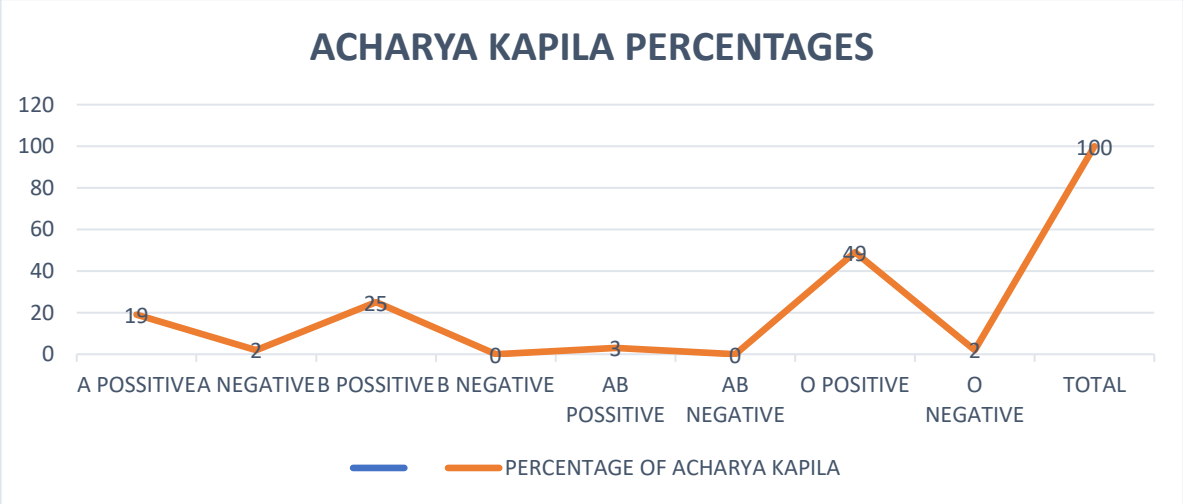
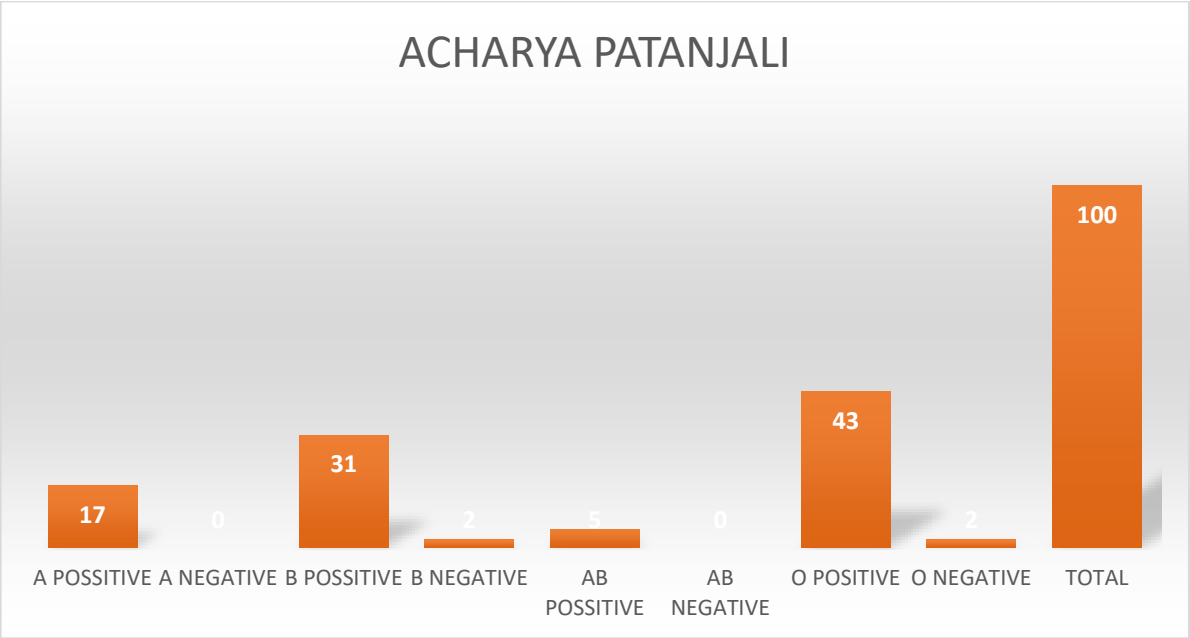


TABLE 6						
ABSTRACT OF ACHARYA KAPILA						
DETAILS OF RH FACTOR						
	FEMALE	PERCENTAGE	MALE	PERCENTAGE	NO. OF PERSONS	PERCENTAGE
POSITIVE	70	95.89%	26	96.29%	96	96%
NEGATIVE	3	4.10%	1	3.70%	4	4%
TOTAL	73	100%	27	100%	100	100%

TABLE 7							
RESULTS OF ACHARYA PATANJALI							
SL. NO	BLOOD GROUP	BLOOD GROUPS IN FEMALE	PERCENTAGE	BLOOD GROUPS IN MALE	PERCENTAGE	NO. OF PERSONS	PERCENTAGE
1	A POSSITIVE	12	15.38%	5	22.72%	17	17 %
2	A NEGATIVE	0	0%	0	0%	0	0 %
3	B POSSITIVE	26	33.33%	6	27.27%	31	31 %
4	B NEGATIVE	2	2.56%	0	0%	2	2 %
5	AB POSSITIVE	4	5.12%	1	4.54%	5	5 %
6	AB NEGATIVE	0	0%	0	0%	0	0 %
7	O POSITIVE	33	42.30%	9	40.90%	42	43 %
8	O NEGATIVE	1	1.28%	1	4.54%	2	2 %
	TOTAL	78	100%	22	100%	100	100 %



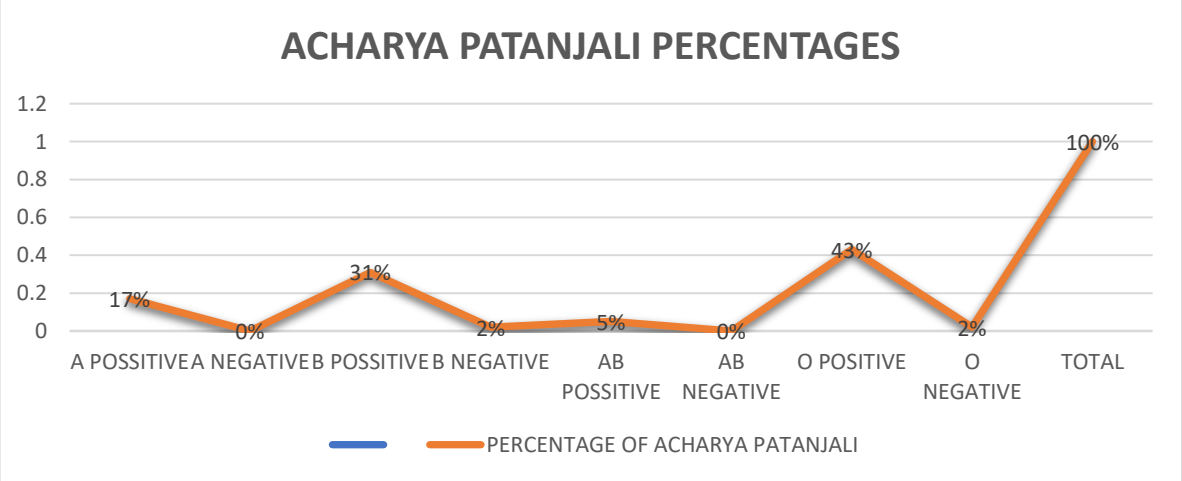


TABLE 8						
ABSTRACT OF ACHARYA PATANJALI						
DETAILS OF RH FACTOR						
	FEMALE	**FEMALE PERCENTAGE**	**MALE**	**MALE PERCENTAGE**	**TOTAL NO. OF PERSONS**	**PERCENTAGE**
POSITIVE	**75**	**96.15%**	**21**	**95.45%**	**96**	**96**
NEGATIVE	**3**	**3.84%**	**1**	**4.54%**	**4**	**4**
TOTAL	**78**	**100%**	**22**	**100%**	**100**	**100**

TABLE 9			
Rh FACTOR & BLOOD GROUPS AND PERCENTAGES OF TOTAL PROJECT			
SL.NO.	**BLOOD GROUP**	**NO OF PERSONS**	**PERCENTAGE**
1	O POSITIVE	171	42.75
2	B POSITIVE	120	30
3	A POSITIVE	80	20
4	AB POSITIVE	15	3.75
5	A NEGATIVE	6	1.5
6	O NEGATIVE	5	1.25
7	B NEGATIVE	3	0.75
8	AB NEGATIVE	0	0
	TOTAL	400	100 %

TABLE 10			
BLOOD GROUPS AND PERCENTAGES OF TOTAL PROJECT			
SL.NO.	BLOOD GROUP	NO OF PERSONS	PERCENTAGE
1	O	176	44 %
2	B	123	30.75 %
3	A	86	21.5 %
4	AB	15	3.75 %
TOTAL		400	100 %

The most common blood group was “O” Positive (42.75%) and least common being “AB” Negative. (Table 9).

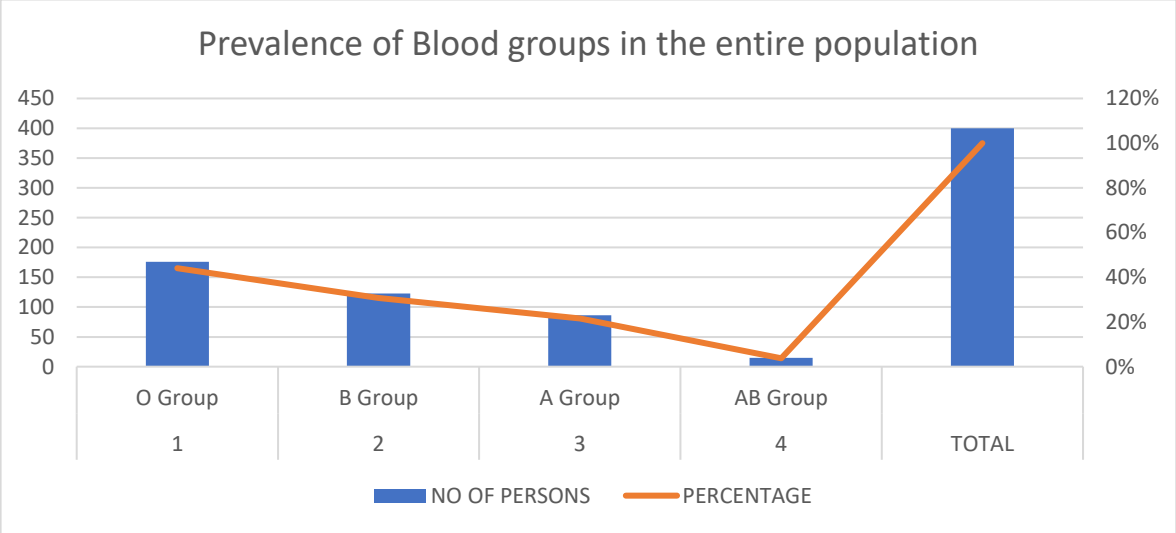
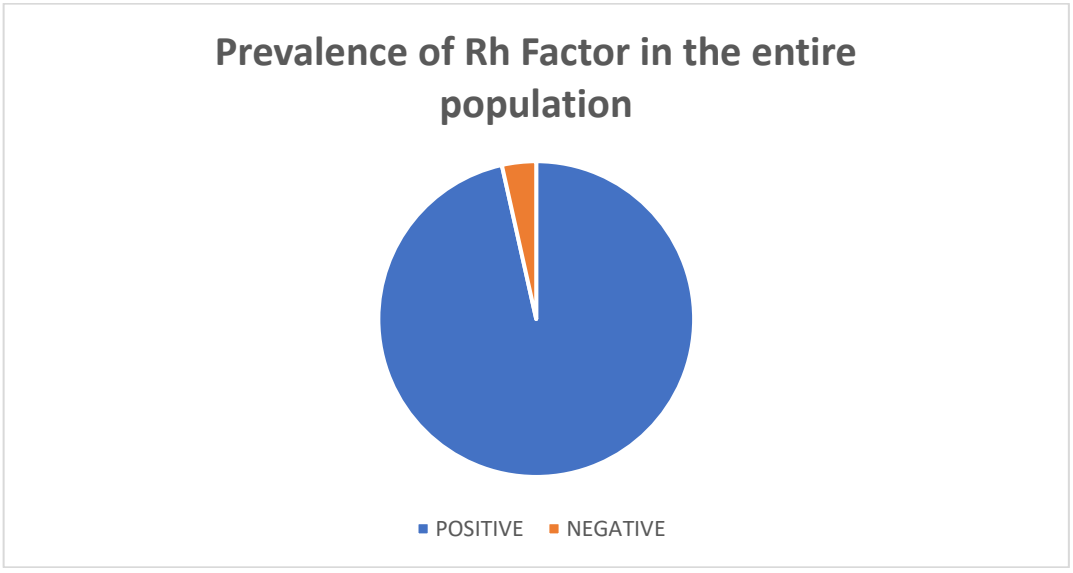


TABLE 11						
DETAILS OF RH FACTOR OF TOTAL PROJECT						
	CHARAKA	**SHUSHRUTHA**	**KAPILA**	**PATANJALI**	**TOTAL PROJECT**	
Rh	**NO. OF PERSONS**	**NO. OF PERSONS**	**NO. OF PERSONS**	**NO. OF PERSONS**	**NO. OF PERSONS**	**PERCENTAGE**
POSITIVE	**97**	**97**	**96**	**96**	**386**	**96.5 %**
NEGATIVE	**3**	**3**	**4**	**4**	**14**	**3.5 %**
TOTAL	**100**	**100**	**100**	**100**	**400**	**100 %**

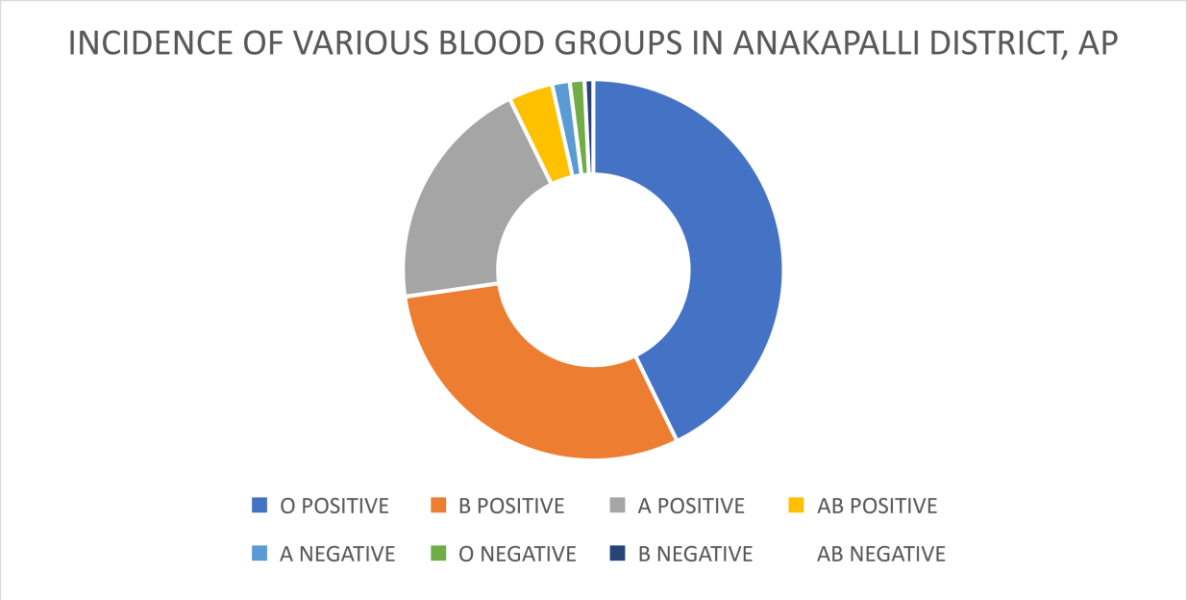


Percentage of Rh D positive were 96.5 % and Rh D negative were 3.5 %. (Table 11)

TABLE 12		
SEX WISE DISTRIBUTION OF DONORS		
Sex	**Number of donors**	**Percentage**
Female	279	69.75 %
Male	121	30.25 %
TOTAL	400	100 %

Blood grouping of 400 donors was done. Female donors were more than male donors, ratio being 69.75 : 30.25 (Table 12)

TABLE 13				
Bloodgroups	**Number of donors according to Rhesus phenotypes**		**Total**	**Percentage**
	Rh positive	***Rh negative***		
O	171 (42.75 %)	5 (1.25 %)	176	44 %
B	120 (30 %)	3 (0.75 %)	123	30.75 %
A	80 (20 %)	6 (1.5 %)	86	21.5 %
AB	15 (3.75 %)	0 (0 %)	15	3.75 %
Total	386 (96.5 %)	14 (3.5 %)	400	100



DISCUSSION

The studies in Northern India by authors like Tulika Chandra et al (Ref.20) at Lucknow, and by Sidhu et al (Ref.23) studies at Punjab,and Western India like in Eastern Ahmedabad by Wadhwa MK et al (Ref.26), Western part of Ahmedabad by Patel, Piyush et al (Ref.25) and studies done at Surat by Nidhi et al, revealed B group is more common than O group followed by A and AB. Our study in contrast showed O group more common than B group.
The studies in Eastern India at Durgapur by Nag et al (Ref.16) showed O group to be the commonest group which is the same blood group distribution as southern India.
Studies done in Southern part of India by Periyavan A et al (Ref.21) at Bangalore, Das PK Nair et al (Ref.13) at Vellore, and at Davanagere by MallikarjunaS et al (Ref. 28) and at Shimoga- Malnad study done by Girish et al (Ref.5), found that the commonest bloodgroup was O followed by B, A and AB which are same as our study.
The percentage of Rh positive blood groups varied from 94% to 98% and Rh negative varied from 2% to 6% in India. Our results also were similar with Rh positive 96.5% and Rh negative 3.5 %
The percentage frequency of blood group O in our population was 44 % (42.75% O Rh positive and 1.25% O Rh negative). Blood group B frequency in our population was 30.75 % (30 % B Rh positive and 0.75 % B Rh negative) followed by blood group A was 21.5 % (20 % A Rh positive and 1.5 % A Rh negative) and blood group AB was 3.75

% (3.75 % AB Rh positive and 0 % AB Rh negative) (Table 9, Table 10 & Table 13)

CONCLUSION

There is a great benefit of conducting observational studies on ABO Rh frequencies at each center as it gives insight to take preventive measures for the diseases which are associated with different blood groups and prepare data for the health professionals to envisage future challenges related to natural or manmade disasters. ABO and Rh blood group distribution among donor population helps in efficient management of transfusion services by making appropriate arrangement of the respective blood groups round the clock and meet the ever-increasing demand of recipient population and hence preventing mortalities due to blood loss. The practice of blood grouping each one at birth must be made mandatory and same should be documented in birth card or maintained as an identity card throughout life which can be of huge help during hemorrhage in any road/air/rail/terror mishap.

The present study concludes that most common blood group is "O" and AB is the least common amongst the blood donors at Anakapalli district of Andhra Pradesh state. Rh positive was 96.5 % and Rh negative were 3.5 %. The data obtained in the present study and several other studies of different regions of India will be useful to face the future health challenges in the district and as well as in the state.

1. The present study concludes that 'O' group is the most frequent position of ABO blood group system followed by 'B' and 'A' groups among the people of the Anakapalli district of Andhra Pradesh. Rh positive people were 96.5 % and Rh negative were 3.5 %. Majority of the people who participated in the project as donors are in the age group of 18 to 22 years.
2. It is concluded that O blood group is significantly high and AB blood group is low in our population.
3. Knowledge of blood group distribution helps to prepare database for blood banks and also create awareness as to which blood groups should bestored and given importance.
4. It is also important and useful for medical diagnosis, genetic information, genetic counseling, forensic medicine needs, and also for the general wellbeing of individual
5. In short blood group database provide data about blood group availability in case of emergencies and insight into future burden of diseases.

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