

## DISTRIBUTION OF ABO AND RHESUS BLOOD GROUPS IN ABRAKA, DELTA STATE

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**Summary:** Blood group systems are determined early in intrauterine life, specific to the individual and therefore significant in management and identification. Seven hundred and ninety five volunteer students of the Abraka campus of Delta State University were analyzed in this 4-year retrospective study. Amongst ABO system, blood group O was most common followed by A, B and AB respectively. Rhesus positive was more common than Rhesus negative in the rhesus system. Gender had no significant effect on both blood group systems studied. In the combined ABO and Rhesus blood groups, O positive was most common followed by A positive, B positive, AB positive O negative and A negative respectively. This study documents ABO and Rhesus blood group distribution patterns amongst south southern Nigerians. Findings will be useful in maintaining a register of possible donors, for effective management of medical emergencies.

### Introduction

Several blood group systems have been discovered but amongst the most important is the ABO group (William, 1999). This system comprises antigens located on the surface of red cells and some other body cells (William, 1999). It has been observed that the serum of some individuals agglutinated red cells of other individuals (Robert *et al*, 2000). Landstainer demonstrated four groups according to antigens available A, B, AB and O and showed that an individual possessed antibodies against those antigens he lacked on the red cell (Robert *et al* 2000). Several other red cell blood groups and hence antigens have been shown (Edwards *et al*, 1995) but the rhesus group is another of utmost importance (William, 1999). Cells which have Rhesus antigen on their surface are described as Rhesus positive while those without this rhesus antigen are Rhesus negative (Robert *et al*, 2000). Studies have shown variability amongst racial and ethnic groups but close relationships however exist within groups in these regions (Abdelaal *et al*, 1999). This study perhaps documents for the first time, ABO and Rhesus blood group distribution in Abraka. It will serve to provide information that is useful in emergency situations where donors are required in absence of a functioning blood storage facility.

### Materials and Methods

The study involved 795 students who were admitted into the Delta State University

Abraka campus for four consecutive years, 1999 to 2003. Data was obtained from the University Health center where ABO tests are done routinely as part of the registration process. The technique involved analyses of blood obtained by venupuncture (Michael, 1995). The ABO sampling was carried out by the standard rapid tile method. This involved mixing one volume of 20% of patient's cells with one volume of commercially obtained antiA and antiB sera respectively on an opal glass tile. The cells and sera in each square were mixed and the tile rocked gently This was then viewed with the aid of good light within two to five minutes and the presence or absence of agglutination noted. This tile method was also used for the determination of rhesus group using commercially obtained antiD sera as control (Dacie, 1995). Approval for this investigation was given by the Research and Ethics Committee of the Faculty of Basic Medical Sciences, Delta State University Abraka prior to the commencement of this study.

### Results

The gender distribution as depicted in table 1 showed that 50.4 % and 49.4% of the subjects were female and male respectively. Gender had no significant effect on the distribution of both blood group systems studied ( $p>0.05$ ) as shown in tables 2 and 3 (Falusi *et al*, 2000). Blood group O was the most common (57.2%) followed by groups A 22%, group B 18.7% and AB 2.1% (Table 1).

Table 1: Distribution of ABO blood groups by sex

GENDER	A	B	A B	O	TOTAL
Female	89	72	8	233	402
Male	86	76	9	222	393
TOTAL	175	14	17	455	795
		8			

Table 2: Distribution of Rhesus blood groups by sex

GENDER	Rh+ve	Rh-ve	NO OF STUDENTS
Female	393	9	402
Male	388	5	393
Total	781	14	795

In table 2, the relative percentages of rhesus blood groups were shown. RhD was the most predominant (98%), while RhD negative phenotype was 1.8%. In table 3, comparisons between rhesus and ABO blood groups showed that O+ve was the most common of all the groups with a rate of 56.3%. This was followed by A+ve, 17%. A-ve was 6% and B-ve, 1%.

Individuals with O-ve blood are described as universal donors owing to the absence of A, B and rhesus D antigens on the surface of the red cells of these individuals. AB blood group was the rarest of all the blood groups. These findings were similar to previous studies in carried out in Nigeria (Onwukeme, 1990). This is of significance especially in emergencies where O-ve or AB blood types may be required

urgently. More so, students with O-ve blood should be counseled especially as regards pregnancies where reactions may occur between RhD antigens of the unborn child and the RhD antibodies of the mother (Sadler, 2000).

The study also showed a low frequency of RhD negative phenotype. This finding was quite similar to that amongst African subjects, West Indians and blacks living in Britain (Arneaud and Young, 1955, Leck, 1969). The results are however in contrast to those obtained in Eastern highlands of Papua guinea where almost 100% of the population had RhD (Salmon *et al*, 1988). It was also unlike in the Indians with a preponderance of RhD negative phenotype 89.7% over the RhD gene of 10.3% (Thangaraj *et al*, 1992).

Table 3: Frequency distribution of ABO and Rhesus Blood groups and Gender

GENDER	A+	A-	AB+	AB-	B+	B-	O+	O-	TOTAL
FEMALE	85	4	8	-	72		228	5	402
MALE	84	2	9	-	75	1	220	2	393
Total	169	6	17	-	147	1	448	7	795
%Total	21.3%	0.7%	2.1%	-	18.5%	0.1%	56.3%	0.8%	100%

## Conclusion

This study further confirms that blood group O was the most common of the ABO blood group system in the population studied. AB blood group was quite rare and Rhesus D was more common than Rhesus D negative phenotype. No correlation was observed between gender, ABO and Rhesus blood groups. The close similarity of blood group distributions in the African groups has also been further emphasized.

## References

- Abdelaal, M. A. (1999). Blood group phenotype distribution in Saudi Arabs *Afr. J. Med. Sci*; 28, 133-135.
- Arneaud, J. O. and Young, O. (1955). A preliminary survey of the distribution of ABO and rhesus blood groups in Trinidad. *Trop J. of Med.*; 7:375-378.
- Dacie, J. V. and Lewis, S. M. (1995). Practical Hematology (6<sup>th</sup> ed). Pp 1. Churchill, Livingstone, London.

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- Edwards, C. R. W., Burchier, I. A. D., Haslett, C. (1995). *Davidsons Principles and Practice of Medicine*. 17<sup>th</sup> ed Pp 824. Churchill Livingstone, London
- Falusi, A. G. (2000). Distribution of ABO and Rhesus genes in Nigeria. *African J of Medicine and Medical Sciences*. 29, 23-26.
- Larnge Medical books/Mc Graw-Hill. New York.
- Leck, I. A. (1969). A note on the blood groups of common wealth immigrants to England. *Br. J. Prev. Soc. Med.* 23:163-165.
- Micheal Swash. (1995). *Hutchisons clinical methods*. 20<sup>th</sup> ed. Pp 444. ELBS with BW.Saunders Company, London.
- Onwukeme, K. E. (1990). Blood group distribution in blood donors Nigeria population. *Nig. J. Physiol. Sci.* 6:67-70.
- Robert, K. (2000). *Harpers Biochemistry*. 25<sup>th</sup> ed Pp 771-772. Appleton and Lange.Stanford, Connecticut.
- Sadler, T. W. (2000). *Langman's Medical Embryology*. 8<sup>th</sup> ed Pp 145.Lippincott. William and Wilkins, United States of America.
- Salmon, D. (1988). Blood groups in Papua New Guinea Eastern Highlands. *Gene Geogr.* 89-98.
- Thangaraj, K., Srikumari, C. R. and Ramesh, A. (1992). The genetic composition of an endogenous Adi-Dravidar population of Tami Nadu. *Gene.Geogr.* 6:27-30.
- William, F. Gannong (1999). *Review of Medical physiology*. 19<sup>th</sup> ed Pp. 514.
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