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## Pattern of Blood Groups among Students of Major Ethnic Groups in Kogi State University, Anyigba-Nigeria

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### KEYWORDS

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### A B S T R A C T

Among the several blood groups so far discovered, research on the ABO group system has drawn the most interest principally due to its medical importance in different diseases. A population of three thousand, three hundred and forty students randomly selected from among student population of the Kogi State University, Anyigba-Nigeria with the aim of having information on the distribution of the ABO and Rh blood groups along the major ethnic groups in the State. Differences were observed in the distribution of the blood among the ethnic subjects with blood group O having the highest distribution among the ABO groups and followed by the B, while AB had the least cutting across the major ethnic groups so studied. Also the Rh positive had the highest percentage while Rh negative had the lowest across the ethnic groups in the state.

### Introduction

Nigeria, with a population of well over 150 million is the largest black population on earth and is known for its socio-cultural, religious and genetic diversity. This rich genetic diversity of the Nigerian population offers a good opportunity for genetic and anthropological researches. The Nigerian population is a highly heterogeneous populated group with a few information on their genetic compositions (Alimba *et al.*, 2009).

The ABO and Rh blood groups system is the most studied trait in human genetics and are among the most important which was first described by Karl Landsteiner in 1900. The classification of blood groups into types A, B, AB and O in the ABO system, Rh-negative and Rh-positive in the Rh system is based on the presence or absence of inherited antigenic substances on the surface of the red blood cells. The antigens may be proteins, carbohydrates, glycoproteins

depending on the blood group systems (Akinnuga *et al.*, 2011). While the ABO blood group is expressed by three alleles on chromosome 9 controlling the four phenotypes; A, B, AB and O, Rh system is genetically complex because it is usually described as a single pair of alleles, D and d on chromosome 1, controlling two phenotypes; Rh negative (Rh -ve) and Rh positive (Rh +ve) (Thompson and Thompson, (1980) and Rehman *et al.*, 2005). The ABO and Rh blood groups are ubiquitously distributed and this variation transcends even among different ethnic groups. The discovery of these blood groups system became a landmark in the blood banking and transfusion medicine. It has also been associated with some disorder in the various populations, such as duodenal ulcer, urinary tract disease and sickle cell anaemia (Alimba *et al.*, 2009).

Several studies on the prevalence of hemoglobin variants in the different Nigerian population have been conducted with conflicting results (Nubila *et al.*, 2013). However, this present study, attempt was made at investigating the distribution of the blood groups and Rh among some students of the Kogi State University, Anyigba who belong to the 3 major ethnic groups in the State.

### **Materials and Methods**

This study was conducted in the laboratory services Department of the Health Services Unit, Kogi State University, Anyigba. The study duration was between October, 2014 and May, 2015.

The total number of students from the three major tribes that assessed the facility for medical test was three thousand three hundred and forty (3340). The students were classified into three major ethnic groups in Kogi State, namely; Igala, Yoruba

and Egbira. Blood samples were collected by cultural venepuncture via disposable 5ml syringe and emptied into the prepared Ethylene diaminetetracetic acid (EDTA) anti-coagulant bottle. Data on frequency of ABO and Rh blood groups were reported using frequency, simple percentages and chi-square were used to determine statistical association at P-value < 0.05.

### **ABO and Rh blood Grouping Tests**

Tile method was used to conduct the test for each participant that was recruited in the study. A clean grease free tile was made available and labeled accordingly. Patients' blood (2ml) was collected after cleaning the cubital surface area with methylated spirit. A drop of Antiserum A, B and anti D was added and mixed with each blood sample using glass stirrer.

Blood was mixed thoroughly with the antiserum and rocked gently for 60 seconds to observe agglutination. In case of doubt, the test was examined under a microscope or the results were confirmed by reverse grouping using known group A and B red cells (Dacie and Lewis, 2001).

### **Results and Discussion**

The three thousand, three hundred and forty (3340) students selected from the sampling frame of all the admitted students in the 2014/15 academic session. 2,018 (60.52%) were males and 1,322 (39.58%) were females.

The distribution of ABO blood group is as shown in Table 1. This study revealed differences in the frequency distribution of ABO blood group among ethnic groups in Kogi State University students. In all tribes, blood group O has the highest percentage (54.52%) while blood group AB has the least percentage (2.99%) as shown in Table

1 below. The distribution of Rhesus blood group and major ethnic groups of the students is shown in Table 2 as 96.69% of Igala tribe were Rhesus negative while 94.90% of Ebira tribes were Rhesus positive. However, 5.10% of same Ebira

tribe were Rhesus negative while 3.31% of Igala tribe were Rhesus negative. There was no statistical significant difference between the Rhesus status and ethnic groups as  $P > 0.05$ .

Table.1 The distribution of ABO blood groups

Ethnic Group	BLOOD GROUP								
	A	%	B	%	AB	%	O	%	TOTAL
Igala	364	(17.70)	468	(22.75)	49	(2.38)	1176	(57.17)	2057
Yoruba	177	(20.77)	192	(22.54)	29	(3.40)	454	(53.29)	852
Egbira	116	(26.91)	102	(23.67)	22	(5.10)	191	(44.32)	431
Total	657	(19.67)	762	(22.81)	100	(2.99)	821	(54.52)	3340

Table.2 The distribution of RH blood group and ethnic

Ethnic	Rhesus positive	Rhesus negative	Total
Igala	1989 (96.69)	68 (3.31)	2057
Yoruba	830 (97.42)	22 (2.58)	852
Egbira	409 (94.90)	22 (5.10)	431
Total	3228 (96.65)	112 (3.35)	3340

df = 2,  $\chi^2 = 5.66$ ,  $P = 0.05914$

Table.3 Distribution of ABO blood group and ethnic groups based on Rh blood group

Ethnic group	Rh Blood group	ABO BLOOD GROUP								
		A	%	B	%	AB	%	O	%	TOTAL
Igala	Positive	360	(17.87)	465	(23.09)	49	(2.43)	1115	56.06	1989
	Negative	4	(9.30)	3	(6.98)	0	(0.00)	61	89.71	68
Yoruba	Positive	173	(20.84)	188	(0.36)	28	(3.37)	441	53.13	830
	Negative	4	(18.18)	4	(18.18)	1	(0.00)	13	59.09	22
Egbira	Positive	106	(25.18)	98	(23.28)	20	(4.75)	185	45.23	409
	Negative	10	(45.45)	4	(18.18)	2	(9.09)	6	27.27	22
Total		657	(19.67)	762	(22.81)	100	(2.99)	1821	54.52	3340

The distribution of the blood group (ABO and Rhesus) and ethnic groups varies significantly based on Rhesus blood group as 96.69% of Igala tribe were Rhesus blood positive while 97.42% of Yoruba tribe were Rhesus positive from this study. Table 3 shows the frequency distribution of ABO blood group and ethnic groups based on Rhesus blood group.

This study revealed that blood group O had the highest distribution among ABO blood group followed by B while AB had the least frequency in the three major ethnic groups of Kogi State University. This is similar to the findings of Akinnuga *et al.*, 2011; Nwanche and Ejele, 2004. This finding was also similar to a study carried out in LAUTECH, Ogbomosho by Akhigbe *et al.*;

2009 which found blood group O to be most prevalent among study groups. This study also shows that there were variation in ABO blood group among different ethnic groups and revealed that blood group O was the most common blood group in all the three major tribes studied and likewise blood group AB was the least common blood group in all the ethnic groups. This is consistent with the previous studies by (Nwanche and Ejele, 2004; Akinnuga *et al.*, 2009). In another study carried out in Mauritania, it was observed that blood group O had the highest frequency followed by A and least frequency was AB and there was no significant variation in these frequencies between the different ethnic groups (Hamed, *et al.*, 2012).

One of the major findings of this study was that Rhesus positive has the highest percentage while Rhesus negative has the lowest percentage across the three ethnic groups studied. This is consistent with findings of previous studies conducted in Elele in Nigeria and Nwauche and Ejele, 2004; Falusi *et al.*, 2000) which showed that the incidence of Rhesus negativity in all the studies conducted in Nigeria was found to be low, between 1.69% and 5.5% as similar to 3.31% to 5.10% obtained in this study.

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