

## Short Communication

# ABO and Rhesus 'D' blood type distribution in students admitted into Moshood Abiola Polytechnic, Abeokuta, Nigeria in 2006

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**All 2000 healthy students of Moshood Abiola Polytechnic, Abeokuta, Nigeria (intakes of 2006/2007 academic session) comprising of 1058 females and 942 males were screened for ABO and Rhesus 'D' blood type. The analysis of the results shows O<sup>+</sup> (49.75%), A<sup>+</sup> (20.30%), B<sup>+</sup> (19.60%), AB<sup>+</sup> (3.70%), O<sup>-</sup> (3.95%), A<sup>-</sup> (1.10%), B<sup>-</sup> (1.35%) and AB<sup>-</sup> (0.25%). These values compares well with what has been reported in other countries. The high percentage of blood group O (53.70%) in the new intakes population provides an advantage in terms of availability of blood for transfusion especially in emergencies.**

**Key words:** ABO and Rhesus 'D' blood type, healthy students, distribution patterns.

## INTRODUCTION

Early experiment with blood transfusion has given birth to the two most significant blood group systems. The ABO blood group in 1901 and the Rhesus group in 1937 (Landsteiner, 1900; Landsteiner and Wiener, 1940) The development of the Coombs test in 1945 (Coombs et al., 1945), advent of transfusion medicine and the understanding of haemolytic disease of the new born led to the discovery of more blood groups and in total today there are 29 human blood groups systems (including the ABO and Rhesus system) as recognised by the International Society of Blood Transfusion (ISBT). Thus, in addition to the ABO antigens and Rhesus antigens, across the 29 blood groups, over 600 different blood group antigens have been found depending on the RBC surface membrane, but many of these are very rare or are mainly found in certain ethnic groups. For example, an individuals can be AB Rhesus D positive, and at the same time M and N positive (using the MNS system), K positive (using the Kell system), and so on, since many of the blood group systems were named after the patients in whom the corresponding antibodies were initially encountered (Dean, 2007; Stayboldt et al., 2006; Kremer et al., 2007).

However, almost always, an individual has the same blood group for life, but rarely, an individual blood type changes through addition or suppression of an antigen in infection, malignancy or autoimmune diseases (Dean, 2007)

Apart from the importance of ABO blood group and Rhesus blood in blood transfusion (blood compatibility before transfusion), pregnancy and child birth, blood types have been used in forensic science and in paternity testing before the advent of DNA analysis which provides greater certitude and has come to replace the use of blood type (Dean, 2007; Kremer et al., 2007).

The ABO system is the most important blood group system in human blood transfusion. The associated anti-A antibodies and anti-B antibodies are usually 'Immunoglobulin M' (IgM) antibodies. They are always produced in the first years of life by sensitization to environmental substances such as food, bacteria and viruses.

Moreover, the Rhesus system is the second most significant blood group system in human blood transfusion; the most significant Rhesus antigen is the Rhesus D antigen because it is the most immunogenic of the five main Rhesus antigens.

However, the test to identify blood type is a test for ABO/Rhesus. One may have A, B, O or AB type blood and may be either Rh<sup>+</sup> or Rh<sup>-</sup>. The basis of the blood group tests is the ability to detect specific substances or antigens on the red blood cells. The A antigens is on type

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**Table 1.** ABO blood group distribution (%) in students admitted into Moshood Abiola Polytechnic, Abeokuta, Nigeria in 2006.

Sex	O	A	B	AB	Total
Female	27.50	11.15	12.00	2.25	52.90
Male	26.50	10.25	8.95	1.70	47.10
Total	53.70	21.40	20.95	3.95	100.00

**Table 2.** Rhesus 'D' blood group distribution (%) in students admitted into Moshood Abiola Polytechnic, Abeokuta, Nigeria in 2006.

Sex	O <sup>+</sup>	O <sup>-</sup>	A <sup>+</sup>	A <sup>-</sup>	B <sup>+</sup>	B <sup>-</sup>	AB <sup>+</sup>	AB <sup>-</sup>	Total
Female	25.45	2.05	10.50	0.65	11.20	0.80	2.10	0.15	52.90
Male	24.50	1.90	9.80	0.45	8.40	0.55	1.60	0.10	47.10
Total	49.75	3.95	20.30	1.10	19.60	1.35	3.70	0.25	100.00

A cells; the B antigen is on type B cells. If neither A nor B antigen are detected, the donor has type O blood; If both are present, the donor has type AB blood. If the major Rhesus antigen is present the donor is Rh<sup>+</sup> (eg O<sup>+</sup>, A<sup>+</sup>, B<sup>+</sup>, or AB<sup>+</sup>); If not the donor is Rh<sup>-</sup> (O<sup>-</sup>, A<sup>-</sup>, B<sup>-</sup>, or AB<sup>-</sup>).

The present study, therefore, aimed at producing (in average) the ABO and Rhesus distribution of new intakes into Moshood Abiola Polytechnic during the 2006/2007 academic for record purposes and health planning.

## MATERIALS AND METHOD

Blood samples were collected into hepanutrin bottles from 2000 healthy students (May to July, 2007) during the students' medical screening process. The freshly collected blood samples were pipetted with the aid of an auto pipette from the hepanutrin bottle onto a white sterile tile at three different spots. Anti A, B and D reagents, (Biotech Laboratories monoclonal, UK) were added respectively and the stirred gently so as to have a homogeneous mixture of the blood and the reagents. The homogeneous mixture was then rock gently for about 60 s and the coagulation/agglutination is then observed.

## RESULT AND DISCUSSION

2000 healthy students were typed for ABO and Rhesus in blood systems and the results are shown in Tables 1 and 2. 53.70% of the population have blood group O, out of which 49.75% were O<sup>+</sup> and 3.95% were O<sup>-</sup>. This is in conformity with the work of the other researchers which shows blood group O to be the most common blood type (Australia 40%; UK 37%; China 40%; USA 38% and France 36%). Moreover, the high percentage of blood group O<sup>+</sup> in the population is an advantage, since blood group O<sup>+</sup> are needed more frequently than any other donor. Although blood group O<sup>-</sup> of 3.95% in the population is very low, people with O<sup>-</sup> negative donors are potential universal red blood cells donors.

Next to the O blood type in the population is blood type A with 21.40%, out of which 20.30% are A<sup>+</sup> and 1.10% are A<sup>-</sup> and this was closely followed by B blood type with 20.95%, out of which 19.60% are B<sup>+</sup> of which 11.20% were females and 8.40% were males. The remaining 1.35% is B<sup>-</sup> comprising of 0.80% female and 0.55% male.

AB blood type which is a universal recipient accounts for the least percentage in the population. 3.70% are AB<sup>+</sup> blood type and 0.25% are AB<sup>-</sup>, females account for 2.10% of the AB<sup>+</sup> and 0.15% of the AB<sup>-</sup>, while males accounts for 1.60% of the AB<sup>+</sup> and 0.10% of the AB<sup>-</sup> blood type compares with (Australia AB<sup>+</sup> 2% and AB<sup>-</sup> 1%; UK AB<sup>+</sup> 3% and AB<sup>-</sup> 1%; USA AB<sup>+</sup> 9% and AB<sup>-</sup> 1%; France AB<sup>+</sup> 3% and AB<sup>-</sup> 1%; China AB<sup>+</sup> 7% and AB<sup>-</sup> < 0.3%)

The low percentage of Rhesus D negatives (Rh<sup>-</sup>) of the female in the population (O<sup>-</sup> 2.05%; A<sup>-</sup> 0.65%; B<sup>-</sup> 0.80% and AB<sup>-</sup> 0.15%) is also an advantage, because of the complicity of the Rh<sup>-</sup> in pregnancy and childbirth.

In conclusion, the study has confirm the work of other researchers, which shows that people with blood type O with Rhesus 'D' positive (Rh<sup>+</sup>) are always higher in number in a population. Further studies are also suggested in Nigeria and Africa countries so as to have Nigeria and order Africa countries version of ABO and Rhesus D blood type distribution.

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