

## Distribution of ABO blood group in surgical patients at a tertiary hospital in rivers state, Nigeria

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### Abstract

The significance of determining the distribution of blood group of patients prior to surgical procedures cannot be over-emphasized. This is because surgical patients may need blood transfusion pre-operatively, intra-operatively or post-operatively. The distribution of ABO blood group varies in different regions of the world.

**Aim:** To determine the distribution of ABO blood group in surgical patients at the Rivers State University Teaching Hospital (RSUTH).

**Method:** This was a one-year retrospective study of Surgical patients (Surgery and Obstetrics/Gynaecology departments) of the RSUTH. The patients comprised of all the consecutive cases of the surgeries in these departments for the period under review. Ethical clearance was obtained from ethical committee of the Rivers State Hospital Management Board. Structured profoma was used to extract information from patients' case notes and analyzed using SPSS version 25.

**Result:** A total of 370 patients were attended to pre-operatively. There were 146 (39.5%) males and 224 (60.5%) females. The mean age was 31 years. The age range was 22 years to 56 years. One hundred and ninety four (52.4%) were obstetrics and gynaecological surgeries while 176 (47.6 %) were non-gynaecological surgeries. The commonest indication for surgery was caesarean representing 126 (34.1%) of the subject. The distribution of blood was as follows O 233 (63.0%), A 66 (17.8%), B 56 (15.1%), AB 15 (4.1%). Sex distribution of blood group O comprised of 140 (37.9%) females had blood O while 93 (25.1%) were males.

**Conclusion:** Our study revealed the most prevalent blood group in surgical patients as blood group as O (63.0%) and the least prevalent blood group was blood group AB. The prime reason for ascertaining blood group especially in surgical patients is for transfusion of compatible blood when the need arises.

**Keywords:** Distribution; Blood group; Surgical patients; Tertiary hospital; Nigeria

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## 1. Introduction

There are differences in the distribution and frequency of ABO and D blood groups locally and globally [1,2]. These differences in ABO is also applicable among surgical patients worldwide [1]. The ABO and Rhesus (D) blood groups remain clinically most important blood group even though since 1901, more than 20 different blood group system have been recognized and characterized [1,2]. Karl Landsteiner, an American Scientist of Austrian origin was the first to discover the ABO blood group which was the first blood group [2].

After wards in 1941, the D blood group was defined by both Lansteiner and wiener [2-4]. The knowledge of the frequencies and distribution of blood group is not only important in organ transplantation, but also in genetic research, forensic pathology, anthropology, and tracing ancestral relations of humans and one most important use of blood group in surgical patients are the importance in blood transfusion [2-6].

In Nigeria, as in many other developing countries of the world, post – partum haemorrhage which may require surgical interventions including the importance of finding out the blood group of such patients and the place of blood transfusion in such patients cannot be over emphasized.<sup>1-2</sup> In addition, in patients preparations for elective surgery in majority of surgical procedures for check for blood group if there is a need for blood transfusion [2-4].

Thus it is important that everyone especially surgical patients should know their blood group, hence the reason for the study of the distribution of blood ABO and D blood group in surgical patients at the RSUTH.

### *Aim*

To determine the distribution of ABO blood group in surgical patients at the Rivers State University Teaching Hospital (RSUTH).

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## 2. Material and methods

This was a one-year retrospective study of Surgical patients (Surgery and Obstetrics/Gynaecology departments) of the RSUTH. The patients comprised of all the consecutive cases of the surgeries in these departments for the period under review. Ethical clearance was obtained from ethical committee of the Rivers State Hospital Management Board. Structured proforma- The content of the proforma were bio-data, socio-demographic characteristics and information on current and previous gestations was used to extract information from patients' case notes and analyzed using SPSS version 25.

### 2.1. Study Population

This study was conducted in the Rivers State University Teaching Hospital. It is a 370 bed hospital located at Harley Street Port Harcourt Local Government Area of Rivers State, South-South Nigeria. It is a tertiary health institution that provides all levels of health care services to Rivers, Bayelsa, Delta, Imo, Abia and Akwa-Ibom States. The Obstetrics/Gynaecology and surgical department are two of the clinical departments of the hospital with thirteen (13) and twelve (12) Consultant Staff respectively.

### 2.2. Data Analysis

Statistical analysis - the information obtained was analysed using SPSS – version 25. The results were computed as frequency of blood group expressed as a percentage. A fisher exact test was carried out to test whether the ABO blood group varies with sex. A p-value < 0.05 was considered to be statistically significant.

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## 3. Results

A total of 370 patients were recruited for the study under observation. There were 146 (39.5%) males and 224 (60.5%) females. The mean age was 31 years. One hundred and ninety four (52.4%) were obstetrics and gynaecological surgeries while 176 (47.6 %) were non-gynaecological surgeries. The commonest indication for surgery was caesarean representing 126 (34.1%) of the subjects. The distribution of blood group was as follows O 233 (63.0%), A 66 (17.8%), B 56 (15.1%), AB 15 (4.1%). Sex distribution of blood group O comprised of 140 (37.9%) females having blood group O while 93 (25.1%) were males. For the educational status 17 (4.6%) had primary level of education, 222 (60%) had secondary level of education, 121 (32.7%) had tertiary education and 10 (2.7%) had no formal education.

**Table 1** Indicating the number of subjects recruited for the study, the age range, the mean age and the most prevalent blood in surgical patients

<b>Number of subjects recruited</b>	<b>370</b>
Age range	22 – 56 years
The mean age	31 years
The most prevalent blood group O	233 (63.0%)

**Table 2** Distribution of Blood group in surgical patients

<b>Blood group</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
O	233	63
A	66	17.8
B	56	15.1
AB	15	4.1
	370	100

**Table 3** Distribution of blood group into positive and negative antigens

<b>Blood group</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>	<b>Blood group</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
O <sup>+</sup> ve	218	59	O <sup>-</sup> ve	15	4.1
A <sup>+</sup> ve	56	15.1	A <sup>-</sup> ve	10	2.7
B <sup>+</sup> ve	50	13.5	B <sup>-</sup> ve	6	1.6
AB <sup>+</sup> ve	13	3.5	AB <sup>-</sup> ve	2	0.5
	337	91.1		33	8.9

**Table 4** Sex distribution of subjects in the study

<b>Sex</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Male	146	39.5
Female	224	60.5
	370	100

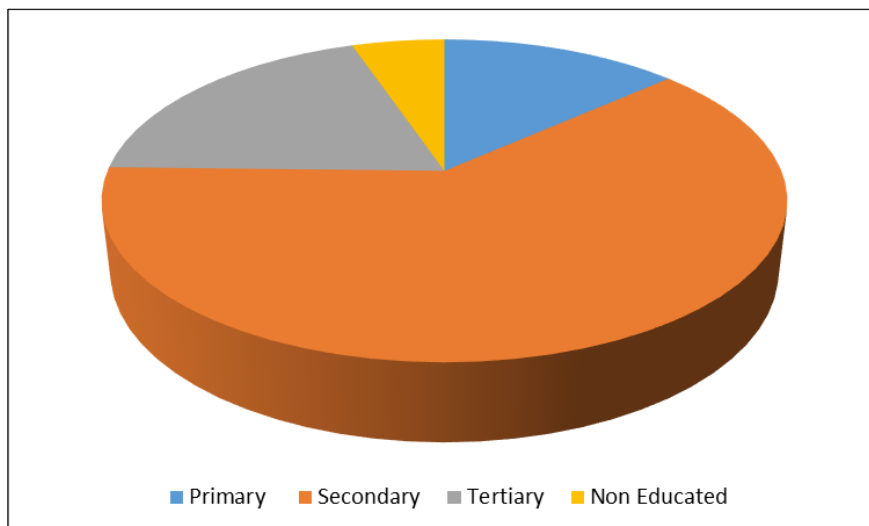
**Table 5** Sex distribution of blood group O

<b>Sex</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Females	140	37.9
Males	93	25.1
	233	63.0

**Table 6** Distribution of Surgeries

Surgeries	Frequency	Percentage (%)
Obstetrics/gynaecologicalSurgeries	194	52.6
Non-obstetrics/gynaecologicalSurgeries	176	47.4
	370	100

### 3.1. Pie chart



Primary – 17 (4.6%); Secondary – 222 (60%); Tertiary – 121 (32.7%); No formal education – 10 (2.97%); Total = 370 (100%)

**Figure 1** Distribution of educational status of the subjects

## 4. Discussion

Our study revealed the most prevalent blood group in surgical patients at the Rivers State University Teaching Hospital as blood group O (63.0%). This was in agreement with the study done by Mohamed A et al in Somalia, which showed that blood group O was the most common, this comprised of 61% of the total blood group a little lower than what was shown in our study [1]. The distribution of blood group from our study showed that O blood group was the most prevalent (63%) followed by A (17.8%), B (15.1%) and AB (4.1%) (tables 1 and 2). The distribution was in agreement with the findings revealed by Mohamed et al in Somalia; blood group O (61%) was the most prevalent followed by blood group A (27%), B (10%), AB (2%) [1,2]. This was not in agreement with the study in Philippines and Indian with blood group B as the most prevalent blood group.<sup>1-4</sup> Our study was also at variance with the study conducted in Europe which showed that blood group A was the most predominant blood group. [1,3,7-10].

For the positive and negative blood distribution from our study, the findings showed that O<sup>+</sup> blood (59%) was more prevalent followed by A<sup>+</sup> (15.1%), B<sup>+</sup> (13.5%) and AB<sup>+</sup> (3.5%). The trend was also similar with the negative blood group, O<sup>-</sup> (4.1%) blood group was the most prevalent followed by A<sup>-</sup> (2.7%), B<sup>-</sup> (1.6%) and AB<sup>-</sup> (0.5%) (table 3). These findings were similar to the findings by Mohamed et al in Somalia [1,2].

From our study, blood group O was more prevalent among the females (37.9%) compared to the males (25.1%) (table 5). This was not in agreement with the study conducted by Mohamed et al in Somalia which revealed that there was no significant distribution in the prevalence of the blood group in the male or female sex.<sup>2</sup> The reasons in our findings may be attributed to the fact that our study population had more females (60.5%) compared to the males (39.5%) (table 4). The most common surgeries were among the obstetrics and gynaecology subjects and this may be one of the reasons why the commonest blood group from this study was found in the female subjects (37.9%), see tables 1,5 and 6.

Majority of the subjects had Tertiary level of education (60%). See pie chart. The Level of their education may be contributory in counseling them for surgical procedure, obtaining informed consent for their surgical procedures and carrying out their blood groups and the need for blood transfusion if there is need for it.

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## 5. Conclusion

This study has shown that blood group O was the most common blood group in Surgical patients at the Rivers state university. Blood group O positive was the most common. In addition, the study revealed that female subjects had the most prevalent of the O blood group.

The importance of blood group in the preparation for surgical procedures cannot be over emphasized and there may be need for blood transfusion prior, intra op or post - operatively as in critical cases of anaemia.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

All authors have declared no conflict of interest.

### *Statement of informed consent*

Informed consent was obtained from all the participants involved in the study.

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