

Prevalence of Rhesus negative blood group in surgical patients in a tertiary hospital in Rivers State, Nigeria

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Abstract

Background: The Rhesus-D negative blood group is not as common in Africans when compared to Caucasians thus the need to optimize surgical patients prior to surgical procedures. Blood group "O" Rh-D negative blood is a universal donor hence its importance in emergency situations where there is no time to type and cross match blood. This is because surgical patients may need blood transfusion pre-operatively, intra-operatively or post-operatively.

Aim: To determine the prevalence of rhesus negative blood group in surgical patients in 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 Rh-D positive blood and Rh-D negative blood were 337 (91.7%) and 33 (8.9%) respectively. The prevalence of Rh-D negative blood group was 33 (8.9%) with blood group O Rh-D negative as the commonest 15 (4.1%).

Conclusion: Our showed the prevalence of Rh-D negative blood group in surgical patients at the Rivers State Teaching Hospital as 8.9%. Rhesus-D "O" negative blood group was the most common representing 4.1% of Rhesus D-negative blood group. This makes it important in emergency surgical practice as universal donor when there may be to time for typing and matching prior blood transfusion.

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

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1. Introduction

The Rhesus (Rh) antigen is found on the surface of human red blood cell (RBC) membrane.[1] The ABO system remain the most clinically significant blood group antigens on the red cell membrane.[1,2] This is important in obstetric practice including those involved in surgeries due to the fact that if the mother is RhD-negative and the fetus RhD-positive, she has potential capacity to form antibodies if exposed to fetal antigens, a process known as Rh-D sensitization.[2-4]

The distribution of ABO and Rh-D blood group varies in different populations (races, ethnic groups and also socio-economic classes).[2] The ABO blood group antigens are determined by carbohydrate molecules that are ordinarily considered as the red cell antigens.[2-5] They are also expressed in other human tissues such as vascular endothelium and epithelial sensory neurons and platelets.[4-5] The second most important blood group system is the Rh, which was discovered in 1941 and includes only 2 phenotypes, Rh-positive and Rh-negative.[4-5] The Rh-D negative blood group is commoner in the Caucasians when compared to Africans.[5,6] Blood group "O" negative blood is a universal donor hence its importance in emergency situations where there is no time to type and cross match blood.[4]

Several studies have been conducted to ascertain the prevalence of ABO and Rh-blood groups in different populations and ethnic groups.[1-2] There has been several reasons for this; the importance of blood transfusion and organ transplantation, their application in genetic research, forensic pathology and anthropology and studying ancestral relationships of humans.[5]

The peculiarity of certain studies including our studies to determine the prevalence of Rh-D negative blood group in surgical patients at the Rivers State University Teaching Hospital is important. This is due to the fact that Rh-D blood group is rare and when there is the need for blood transfusion especially in our poor resource environment where anaemia is prevalent based on myriad of factors such as poor nutrition, poverty and ignorance. There is every need to optimize surgical patients prior to surgical procedures.[7]

Aim

To determine the prevalence of rhesus negative blood group in surgical patients In the Rivers State University Teaching Hospital (RSUTH).

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 twelve (13) and twelve (12) Consultant Staff respectively.

2.2. Data Analysis

Statistical analysis the information obtained was analysed using SPSS – version RES. The results was 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.

3. Results

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 Rh-D positive blood and Rh-D negative blood were 337 (91.7%) and 33 (8.9%) respectively. The prevalence of Rh-D negative blood group was 33 (8.9%) with blood group O Rh-D negative as the commonest 15 (4.1%). For the educational status 17 (4.6%) had primary level of education, 222 (60%) had secondary 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

Number of subjects recruited	370
Age range	22 – 56 years
The mean age	31 years
The most prevalent rhesus negative blood group (O-ve)	15 (4.1%)

Table 2 Distribution of blood group into positive and negative antigens

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

Table 3 Sex distribution of subjects in the study

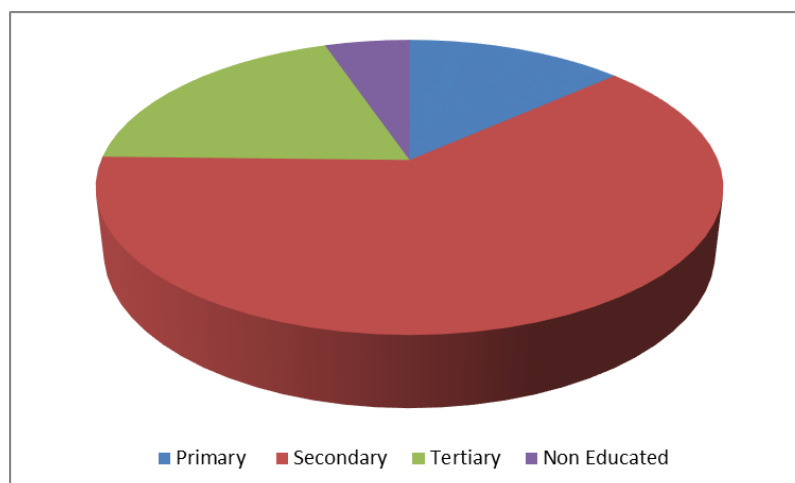
Sex	Frequency	Percentage (%)
Male	146	39.5
Female	224	60.5
	370	100

Table 4 Sex distribution of blood group O

Sex	Frequency (n)	Percentage (%)
Females	20	5.4
Males	13	3.5
	33	8.9

Table 5 Distribution of Surgeries

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



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 showed the prevalence of Rh-D negative blood group in surgical patients at the Rivers State Teaching Hospital as 8.9%. This was at variance with a study by Etim et al in Adamawa, Nigeria where the prevalence of Rh D-negative blood was 11.8%.[8] This was not in agreement with the studies done by Enangaw et al in Ethiopia and Satishk in India et al where the prevalence of Rh D-negative blood group were 7.5% and 6.49% respectively.[2,6] These figures were lower than that from our study which was 8.9%. However, in another study conducted in Iran by Andalibi et al the prevalence of Rh D-negative blood group was 11.8%.[4] This prevalence of Rh D-negative blood was higher than that gotten from our study.

The pattern of Rh D-negative blood group from our research work revealed that Rh O- negative blood group was the most prevalent (4.1%) followed by A (2.7%), B (1.6%) and AB (0.5%) (Tables 1 and 2). Mohamud et al in Somalia in their study also showed that Rh O- negative blood group was the most prevalent Rh D-negative blood group.[7] Eli et al in Port Harcourt, Nigeria also revealed in the study of the distribution of blood group Rh O- negative blood group was the most prevalent in surgical patient's Rh D-negative blood group.

The distribution of Rh D-negative blood group from our study was in this order blood group, O^{-ve} (4.1%) blood group was the most prevalent followed by A^{-ve} (2.7%), B^{-ve} (1.6%) and AB^{-ve} (0.5%) (Table 3). These findings were similar to the findings by Mohamud et al in Somalia.[1,2]

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 prechart. 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.

5. Conclusion

Our study showed the prevalence of Rh-D negative blood group in surgical patients at the Rivers State Teaching Hospital as 8.9%. Rhesus-D "O" negative blood group was the most common representing 4.1% of Rhesus D-negative blood group. This makes it important in emergency surgical practice as universal donor when there may be no time for typing and matching prior blood transfusion.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

All authors have declared no conflict of interest.

Statement of ethical approval

Ethical clearance was obtained from ethical committee of the Rivers State Hospital Management Board.

Statement of informed consent

No need to provide Statement of informed consent this is a retrospective study.

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