

PREVALENCE OF PRE-OPERATIVE ANAEMIA IN SURGICAL PATIENTS AT THE RIVERS STATE UNIVERSITY TEACHING HOSPITAL

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ABSTRACT

Background: Pre-operative anaemia is a notifiable and modifiable risk factor for surgical patients. It has been closely linked with increased post-operative morbidity, mortality and increased risk of peri-operative blood transfusion. According to large observational study the prevalence of pre-operative anaemia ranges from 25% to 40%. Establishment of pre-operative anaemia screening clinic is necessary to enhance the diagnosis and management of pre-operative anaemia.

Aim: To determine the prevalence of pre-operative anaemia in surgical patients at the Rivers State University Teaching Hospital (RSUTH).

Method: It was a cross sectional study of pre-operative patients at the Surgery and Obstetrics/Gynaecology departments of The Rivers State University Teaching Hospital. The cut-off for anaemia was 33% in line with the World Health Organization (WHO). The Information was retrieved from patients case notes using a structured profoma and analyzed using SPSS version 25.

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. 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 section representing 126 (34.1%) of the subjects. Two hundred and seventy two of the subjects(73.5%) had PCV less than 33%. One hundred and eighty four (67.9%) women had PCV less than 33% while 88 (32.1%) of the men had PCV less than 33%.

Conclusion: The study revealed that prevalence of anaemia amongst pre-operative patients at RSUTH was 73.6%. Anaemia was highest amongst Obstetrics and gynaecological patients compared to other surgical patients.

Key words: Prevalence, Anaemia, Pre-surgery, RSUTH

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INTRODUCTION

Pre-operative anaemia is a notifiable and modifiable risk factor for surgical patients.[1] It has been closely linked with increased post-operative morbidity, mortality and increased risk of peri-operative blood transfusion[1-2]. According to large observational study the prevalence of pre-operative anaemia ranges from 25% to 40%[1]. Establishment of pre-operative anaemia screening clinic is necessary to enhance the diagnosis and management of pre-operative

anaemia[1-3]. Pre-operative anaemia is defined as packed cell volume less than 33%[1-2]. The World Health Organization (WHO) has emphasized that reasonable measures need to be taken to optimize pre-operative patients, using a patient's blood management (PBM) approach [2]. The burden of anaemia is more in the developing countries of the world; in this part of the globe factors that contribute to anaemia can best be explained by three important factors namely ignorance, illiteracy and poverty [3-6].

Anaemia in pregnancy affects both the mother and the developing fetus [4]. Its adverse effects depend on the severity [5]. In addition, anaemia in pregnancy predisposes the pregnant woman to maternal death especially in severe cases. Miscarriages, prematurity and low birth weight are adverse effects on anaemia to the developing fetus [6,7].

Literature have revealed that 20% of patients undergoing major orthopaedic surgery have preoperative anaemia [7]. Thus as recommended by the Third National Health and Nutritional Examination Survey data, optimization of individual's preoperative iron stores which helps resolve a good number of anaemia prior to surgery [8]. Furthermore, preoperative anaemia has been shown to be associated with increased perioperative blood transfusion, health care costs, morbidity and mortality [9].

Some studies have revealed that certain persons such as the elderly are at increased risk of anaemia. One of such studies conducted by WHO on elderly hospitalized patients over a 6-month time frame revealed that 50% of those patients were anaemic [10]. Researchers have shown that the prevalence of anaemia was higher in pre-operative patients compared to the general population[10-11]. In a study of 97,443 surgical patients prevalence of pre-operative anaemia was 27.8% [8-10]. In a meta-analysis conducted on 114,227 cardiac elective patients revealed that 20.6% had anaemia. However, in another study the prevalence of pre-operative anaemia was between 23 – 45% [9-14].

AIM/OBJECTIVE

To determine the prevalence of pre-operative anaemia in surgical patients at the Rivers State University Teaching Hospital (RSUTH).

MATERIALS AND METHODS

It was a cross sectional study of pre-operative patients at Surgery and Obstetrics/Gynaecology departments of The Rivers State University Teaching Hospital. The sample size of 370 was calculated using the formular $n=Z^2pq/d^2$. Where Z is the degree of confident = 1.96, P = 55, q = p-1, d is error margin = 0.05. The cut-off for anaemia was 33% in line with the World Health Organization (WHO). The Information was analyzed using SPSS version 25.

Sample size Estimation

The sample size of 370 was calculated using the Kish Leslie formula for cross-sectional studies calculated, based on 40% prevalence of pre-operative anaemia from the WHO study by Munoz M et al [2] and a confidence level of 95%.

$$n= Z^2Pq/d^2$$

Where

n is the desired sample size

Z is the standard normal deviate usually set at 1.96, which corresponds to the confidence interval

P is the proportion of pregnant women with anaemia which in this case is 40%

q is complementary proportion equivalent to one (1), that is 1- 0.55% equal to 0.45%

d is the degree of accuracy desired which is 5.0% (0.05%)

$$n= 1.96^2 \times 0.55 (1- 0.55)/0.05^2$$

$$= 368.8$$

This was rounded up to the nearest whole number, the reason for using 370 as the sample size.

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.

METHODS

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Packed Cell Volume estimation

The packed cell volume were obtained using a hematology auto analyser.

- **Inclusion criteria**
Healthy patients with singleton pregnancy
- **Exclusion criteria**
Patients with sickle cell disease and haemophilia
Patients with vaginal bleeding in the current pregnancy

DATA ANALYSIS

The data were coded and analysed by using the Statistical Package For Social Sciences (SPSS) software version 25. P value <0.05 was considered significant.

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. 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. Two hundred and seventy two of the subjects (73.5%) had PCV less than 33%. One hundred and eighty four (49.8%) women had PCV less than 33% while 88 (23.8%) of the men had PCV less than 33%. 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.

DISCUSSION

The study revealed the prevalence of pre-operative anaemia at the Rivers State University Teaching Hospital was 73.6%. This figure is higher than those in studies in Nigeria and other developed countries of the world.²⁻⁶ The sex distribution of anaemia were 49.8% of females compared with 23.8% for males as shown in **Table 1**.

Table 1: Sex distribution of subjects in the study

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

Majority of the subjects with pre-operative anaemia were from the obstetrics and gynaecology 52.6% with those going caesarean section representing 34.1% of the subjects.

Table 2: Distribution of surgeries

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

The study revealed that the pre-operative prevalence of anaemia for non-obstetric and gynaecological surgeries was 23.8%. This value is in agreement with studies done in different parts of Nigeria and globally [4-6]. The non-obstetrics and gynaecological surgeries were general surgery, orthopaedic, urological, ophthalmology, ear/nose/throat surgeries and other specialties of surgery

Table 3: Distribution of anaemic and non-anaemic subjects

Subjects	Frequency	Percentage (%)
Anaemic	272	73.6
Non-anaemic	98	26.4
	370	100

Table 4: Sex distribution of subjects with anaemia

Sex	Frequency	Percentage (%)
Male	88	23.8
Female	184	49.8
	272	73.6

From the study those with tertiary level of education had the lowest prevalence of pre-operative anaemia representing 8.7% of those with anaemia compared with those who had no formal education and had 100% preoperative anaemia as shown in **Table 5**.

Table 5: Comparison between the level of education and anaemia amongst pre-operative patients

Level of education	Frequency (%)	Anaemia
No formal education	10 (2.7%)	10 (2.7%)
Primary	17 (4.6%)	16 (4.3%)
Secondary	222 (60%)	214 (57.9%)
Tertiary	121 (32.7%)	32 (8.7%)
Total	370 (100%)	272 (73.6%)

The reason for this correlation is that those with formal education are more likely to have better nutrition with intake of haematinics in general [3-4][7-15]. In addition, subjects with tertiary level of education with co-morbidities such as HIV and tuberculosis or any other infections with depleted iron stores are more likely to seek treatment, thus improving their iron stores[5-8].

Munoz M et al in a WHO study revealed the prevalence of pre-operative anaemic patients to be between 20 – 40% [2]. The pre-operative patients included general surgery, orthopaedic, cardio-thoracic and vascular surgery [1-3][10-12]. This study showed the prevalence of pre-operative anaemia amongst non-gynaecological subjects as 23.8% [2]. In the same study by Munoz et al the prevalence of pre-operative anaemia amongst obstetrics and gynaecological subjects was approximately 50%. This was in keeping with our study which was 49.8%. This was lower in some studies done in rural parts of the country [6-11]. This is because our study was done in the urban area where the government and non-governmental organizations carries out health enlightenment campaigns

through the mass media on the need for ante natal mothers to be compliant with ante natal visits and hence reducing the incidence of anaemia in the urban areas [2-4][14-17].

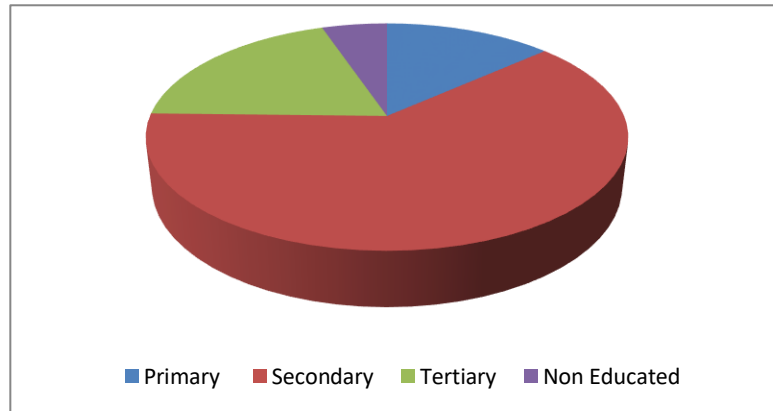


Figure 1 : Distribution of educational status of the subjects

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

The mean age in this study was 31 years with prevalence of pre-operative anaemia as 73.6%. In our study prevalence of pre-operative anaemia amongst obstetrics/gynaecological subjects was 49.8% and for non-gynaecological subjects was 23.8%. However, in a study conducted by WHO revealed that elderly hospitalized patients over a 6-month time frame revealed that 50% of those patients were anaemic.¹⁵ This is in agreement with our study for the non-obstetrics and gynaecological subjects where the prevalence of pre-operative subjects was 23.8% and not in agreement for obstetrics and gynaecological subjects with a prevalence of 49.8%.

CONCLUSION

The prevalence of pre-operative anaemia was high at the Rivers State University Teaching Hospital (RSUTH) which was 73.6%. Prevalence was highest amongst obstetrics and gynaecological subjects represented by 49.8%. Non-obstetrics/gynaecological surgical pre-operative surgeries which included general surgeries, orthopaedic, urological surgery just to mention a few revealed a prevalence of 23.8%, this was within the global prevalence of between 20 to 40%.

Pre-operative anaemia has been identified as an important predictor for post-operative morbidity and mortality and based on advancement of anaesthesiology and surgery; optimization especially for elective surgery is not as challenging as in previous years. As a result of improved therapy with such options that traverses iron and erythropoietin which are well tolerated is the reason why the correction of sub-optimal level of pre-operative anaemia is well encouraged across the globe.

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