

(RESEARCH ARTICLE)



Prevalence of post-operative anaemia in surgical patients at the Rivers State University Teaching Hospital

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World Journal of Advanced Research and Reviews, 2021, 10(01), 218–223

Publication history: Received on 05 March 2021; revised on 18 April 2021; accepted on 21 April 2021

Article DOI: <https://doi.org/10.30574/wjarr.2021.10.1.0149>

Abstract

Background: Post-operative anaemia is often a reflection of pre-operative pre-operative work-up and pre-operative anaemia. In addition. Post-operative anaemia is also determined by co-morbidities of patients prior to surgery. The prevalence of post-operative anaemia varies based on surgical specialties and the experience of the surgeon; prevalence rates as high as 85% have been recorded in orthopaedic surgeries.

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

Method: This was a six months cross sectional study of the post-operative anaemia of patients who had operation at the Surgery and Obstetrics/Gyaecology departments of The Rivers State University Teaching Hospital. The permission for the study was granted by the head of department of obstetrics and gynaecology in conjunction with the head of .the hospital management. The yard stick for anaemia was packed cell volume less than 33% in line with the World Health Organization (WHO). A structured proforma was used to obtain information from patient's case notes and analyzed using SPSS version 25.

Result: Three hundred and eighty subjects were recruited for the study. Males subjects were 150 (39.5%) while females were 230 (60.5%) respectively. The mean age was 31 years. One hundred and ninety nine (52.4%) were obstetrics and gynaecological surgeries while 181 (47.6 %) were non-gynaecological surgeries. The commonest indication for surgery was caesarean section representing 130 (34.2%) of the subjects. Two hundred and sixty six of the subjects (70%) had PCV less than 33%. One hundred and fifty two (40%) women had PCV less than 33% while 114 (30%) of the men had PCV less than 33%.

Conclusion: The study revealed that prevalence of post-operative anaemia amongst surgical patients at RSUTH was 70 %. The post-operative anaemia amongst women was worrisome. The need to optimize patients prior to surgery cannot be over-emphasized to prevent morbidities and mortalities post-operative.

Keywords: Prevalence; post-operative; Anaemia; Surgery; RSUTH

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1. Introduction

Post-operative anaemia is often a reflection of pre-operative work-up prior to surgery[1-4]. In addition, post-operative anaemia is also determined by co-morbidities of patients prior to surgery of which sepsis is a common example.[2] The prevalence of post-operative anaemia varies based on surgical specialties and the experience of the surgeon; prevalence rates of post-operative anaemia as high as 85.8% has been documented by Kunz et al in elective orthopaedic surgeries[2,5]. Furthermore, post-operative anaemia has closely been linked to increased post-operative morbidity, mortality and increased risk of peri-operative blood transfusion [1-2]. 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 associated modifiable risk factors of anaemia are ignorance, illiteracy and poverty. These factors are more in the developing countries of the world [1,6.]

There a good number of complications that are associated with post-operative anaemia [1,2-7.] In a meta-analysis involving approximately one million patients who had non-cardiac surgery, the prevalence of post-operative anaemia was high as well as other co-morbidities such as high mortality rate.⁵⁻⁸ In addition, post-operative complications that may result of post-operative anaemia are sepsis, pneumonia, venous thrombosis, stroke, poor wound healing, acute myocardial infarction and cardiac failure [2,9-14.]

Literature have revealed that elderly persons were more predisposed to post-operative anaemia [10.] The reason for this is some fractions of these elderly patients have some level of anaemia prior to surgery [9-14]. 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 [10,15].

1.1. Aim

To determine the prevalence of post-operative anaemic surgical patients following surgery at the Rivers State University Teaching Hospital (RSUTH).

2. Material and methods

This was a cross sectional study of post-operative anaemic patients following Surgery and Obstetrics/Gynaecology departments of The Rivers State University Teaching Hospital over a 6 month period. The sample size of 380 was calculated using the formular $n = Z^2pq/d^2$. Where Z is the degree of confident = 1.96, P = 50, 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.

2.1. Sample size estimation

The sample size of 380 was calculated using the Kish Leslie formula for cross-sectional studies calculated, based on 50% prevalence of post-operative anaemia from the study by Kunz JV et al² 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 50%

q is complementary proportion equivalent to one (1), that is 1- 0.50% equal to 0.50%

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

$$n = 1.96^2 \times 0.50 (1 - 0.50) / 0.05^2$$

$$= 384.16$$

This was rounded up to the nearest whole number, the reason for using 380 as the sample size.

2.2. 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.

2.3. Methods

The relevant information for the study were extracted from case notes of patients in the obstetrics/gynaecology and surgery departments who were eligible for the study had their information filled into a structured proforma. The content of the proforma were bio-data, socio-demographic characteristics and information on current and previous gestations.

Packed cell volume (PCV) was determined by collecting two millilitres (2mls) of venous blood. This was collected from the ante cubital vein using plastic disposable bottles for each of the subjects. The sample bottles contain ethylene diamine-tetra acetic acid (EDTA).

2.4. Packed Cell Volume estimation

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

2.4.1. Inclusion criteria

All post-operative surgical patients including post-operative obstetric patients who had singleton pregnancy.

2.4.2. Exclusion criteria

Patients with sickle cell disease and haemophilia Post-operative obstetric patients with vaginal bleeding prior to surgery.

2.5. 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.

3. Results

Three hundred and eighty subjects were recruited for the study. Males subjects were 150 (39.5%) while females were 230 (60.5%) respectively. The mean age was 31 years. One hundred and ninety nine (52.4%) were obstetrics and gynaecological surgeries while 181 (47.6 %) were non-gynaecological surgeries. The commonest indication for surgery was caesarean section representing 130 (34.2%) of the subjects. Two hundred and sixty six of the subjects (70%) had PCV less than 33%. One hundred and fifty two (40%) women had PCV less than 33% while 114 (30%) of the men had PCV less than 33%. For the educational status 18 (4.7%) had primary level of education, 244 (59.0%) had secondary education, 127 (32.7%) had tertiary education and 11(2.9%) had no formal education.

Table 1 Sex distribution of subjects in the study.

Sex	Frequency	Percentage (%)
Male	150	39.5
Female	230	60.5
	380	100

Table 2 Distribution of Surgeries.

Surgeries	Frequency	Percentage (%)
Obstetrics/gynaecological surgeries	199	52.4
Non-obstetrics/gynaecological surgeries	181	47.6

Table 3 Distribution of post-operative anaemic and non-anaemic subjects.

Subjects	Frequency	Percentage (%)
Anaemic	266	70
Non-anaemic	114	30
	380	100

Table 4 Sex distribution of subjects with anaemia.

Gender	Frequency	Percentage (%)
Male	114	30
Female	152	40
	266	70

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

Level of education	Frequency (%)	Anaemia
No formal education	11 (2.9%)	11 (2.9%)
Primary	18 (4.7%)	15 (4.0%)
Secondary	224 (59.0%)	214 (56.3%)
Tertiary	127 (33.4%)	26 (6.8%)
Total	380 (100%)	266 (70%)

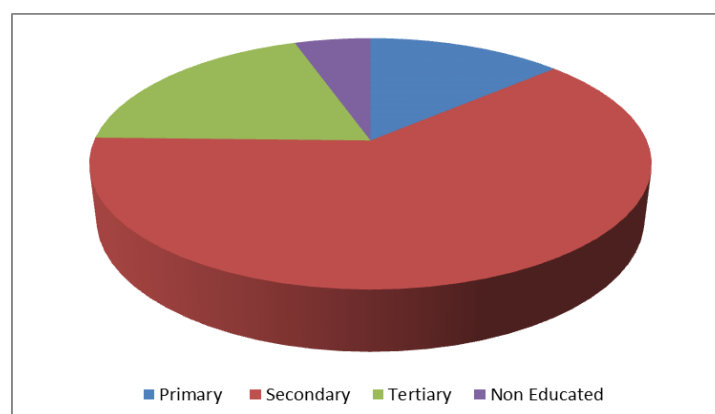


Figure 1 Distribution of educational status of the subjects

Primary – 18 (4.7%)
Secondary – 244 (59.0%)
Tertiary – 127 (33.4%)
No formal education – 11 (2.9%)
Total = 380 (100%)

4. Discussion

The study revealed the prevalence of post-operative anaemia at the Rivers State University Teaching Hospital was 70%. This figure is higher than those in studies in Nigeria and other developed countries of the world [2-6]. However, this figure was lower than the prevalence of post-operative anaemia who had elective orthopaedic surgery as documented by Kunz JV et al. The sex distribution of anaemia were 60.5% of females compared with 39.5% for males as shown in table 1. Majority of the subjects with post-operative anaemia were from the obstetrics and gynaecology 60.5% with those who had caesarean section representing 34.2% of the subjects.

The study revealed that the post-operative prevalence of anaemia for non-obstetric and gynaecological surgeries was 30.0%. 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.

From the study those with tertiary level of education had the lowest prevalence of post-operative anaemia representing 6.8% of those with anaemia compared with those who had no formal education and had 100% preoperative anaemia as shown in table 5. 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 comorbidities 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].

Kunz JV et al in a study revealed the prevalence of post-operative anaemic patients who had elective orthopaedic surgery was 85.8% [2]. The post-operative patients included general surgery, obstetric, gynaecological, 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 the prevalence of pre-operative anaemia contributed immensely to post-operative morbidities including post-operative anaemia [1,4-5]. This was lower in some studies done in rural parts of the country [6-11]. The reason why the post-operative anaemia was higher than prevalence of pre-operative anaemia in some rural communities was because prior to surgery these patients packed cell volumes were optimized and majority of these patients had at least secondary level of education [2-4,14-17].

The mean age in this study was 31 years with prevalence of post-operative anaemia as 70.0%. In our study prevalence of post-operative anaemia amongst obstetrics/gynaecological subjects was 52.4% and for non-gynaecological subjects was 47.6%.

5. Conclusion

The study revealed the prevalence of post-operative anaemia as 70% at the Rivers State University Teaching Hospital (RSUTH). It is worrisome that the prevalence of post-operative anaemia was above average for obstetrics and gynaecological patients after surgery. Even though the prevalence of post-operative non-obstetrics/gynaecological was below average there is still need to improve on their packed cell volume after surgery.

Compliance with ethical standards

Acknowledgments

Mother, Baby and Adolescent Care Global Foundation (Previously Mother and Baby Care Global Foundation)

Disclosure of conflict of interest

There was no conflict of interest.

References

- [1] Ugwu EO, Obioha K, Okezie O. A Five-year Survey of Caesarean Delivery at a Nigerian Tertiary Hospital. *Annals of Medical and Health Sciences Research*. 2011; 1(1): 77-83.
- [2] Kunz JV et al. Post-operative anaemia might be a risk factor for post-operative delirium and prolonged hospital stay. A secondary analysis of a prospective cohort study.
- [3] Musailam KM, Tamim HM, Richards T, Spahn DR, Rosendal FR, Habbal A et al. Pre-operative anaemia and post-operative outcomes in non-cardiac surgery: a retrospective cohort study. *Lancet* 2011; 378(9800):1396 – 407.
- [4] Miceli A, Rmeo F, Glauber M, de Siena PM, Caputo M, Angelini GD. Pre-operative anaemia increases mortality and post-operative morbidity after cardiac surgery. *J Cardiothoracic Surg* 2014; 9: 137.
- [5] Choi YJ, Kim SO, Sim JH, Hahm KD. Post-operative Anaemia is Associated with Acute Kidney injury in Patients Undergoing Total Hip Replacement Arthroplasty: A Retrospective Study. *Anesth Analg*. 2016;122(6): 1923 – 8.
- [6] Anorlu RI, Oluwole AA, Abudu OO. Sociodemographic factors in anaemia in pregnancy at booking in Lagos Nigeria”. *Journal of Obstetrics and Gynaecology*. 2006; 773-776.
- [7] Buseri FI, Uko EU, Jeremiah ZA, Usanga EA. ‘Prevalence and risk factors of anaemia among pregnant women in Nigeria, *Open Journal of Haematology*. 2008; 2: 14-19.
- [8] Oprea AD, Del Rio JM, Cooter M, Green CL, Karhausen JA, Nailor P et al. Pre and Post-operative anaemia, acute kidney injury and mortality after coronary artery by-pass grafting surgery.
- [9] Fowler AJ, Ahmad T, Phul MK, Allard S, Gillies MA, Pearse RM. Meta-analysis of the association between pre-operative anaemia and mortality after surgery. *Br J Surg*. 2015; 102(11): 1314 – 24.
- [10] Kzek-Langerecker SA, Ahmed AB, Afshari A et al. Management of severe peri-operative bleeding guideline from the European Society of Anaesthesiology. *European Journal of Anaesthesiology*. 2017; 34: 332 – 95.
- [11] Munoz M, Acheson AG, Aurbach M et al. International Consensus Statement on the peri-operative management of anaemia and iron deficiency. *Anaesthesia*. 2017; 72: 233-47.
- [12] Mieybohm P et al. [Patient-blood-Management: Current state of the literature]. *Chirurg* 2016; 87(1):40-6.
- [13] Klein AA et al. Association of Anaesthetists guidelines: cell salvage for peri-operative blood conservation. *Anaesthesia*. 2018; 73: 1141- 50.
- [14] Goss I, Sergeant B, Hofmann A, Spann DR. Partial blood management in cardiac surgery results in fewer transfusions and better outcome. *Transfusion*. 2015; 55: 1075 – 81.
- [15] Gurainik JM, Eisenstaedt RS, Fernicci L, Klein HG, Woodman RC. Prevalence of anaemia in persons 65 years and older in the United States: evidence for a high rate of unexplained anaemia. *Blood*. 2004; 104(80): 2263 – 2268.