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# Prevalence of Anaemia in ICU Admissions at the Rivers State University Teaching Hospital

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**ABSTRACT**

**Background:** Anaemia is a Public Health challenge globally. Anaemia is a common morbidity in intensive care units (ICU) especially in developing countries of the world where critically ill patients present with deficiency of haemoglobin concentration.

**Aim:** To determine the prevalence of anaemia in ICU admissions at the Rivers State University Teaching Hospital (RSUTH).

**Methodology:** This was a one-year retrospective study conducted at ICU of RSU. All consecutive patients admitted in the ICU were involved in the study. The cut-off for anaemia was Packed Cell Volume <33% or Haemoglobin concentration <11g/dl. Information were analysed with SPSS version 25.

**Results:** Ninety-seven subjects were evaluated under year review. There 38 (29.2%) males and 59 (60.8%) females. The age range was 14 to 87 years with the modal age of 30 years. There were 44 (45.4%) patients that had medically related conditions while 53 (54.6%) were surgically related. Subjects with PCV <33% were 28 (28.8%) of which females were 21 (21.6%) and female 7 (7.2%).

**Conclusion:** The prevalence of anaemia at ICU of the Rivers State University was 28.8%. The prevalence of anaemia was higher in females compared to males. Patients should be optimized for better outcomes.

## INTRODUCTION

Anaemia is a Public Health challenge globally. Anaemia is a common morbidity in intensive care units (ICU) especially in developing countries of the world where critically ill patients present with deficiency of haemoglobin concentration.[1] Anaemia is defined as packed cell volume (PCV) less than 33% or Haemoglobin concentration less than 11g/dl.[2] Myriad of studies have revealed that approximately tw0-thirds of patients admitted in the ICU are anaemic on the day of admission and over 90% of the patients become anaemic after one week in the ICU.[3]

Anaemia in ICU-admitted patients poses challenge in both patient management and patient outcome,[4] This haematological risk factor raises patient mortality and morbidity.[4] The adverse outcomes comprises of cognitive heart failure, respiratory failure, hypoxia, cardiac arrest, multiple organ failure, chronic kidney disease, failure of weaning from a mechanical ventilator prolonged hospitalization, infection and increased chance of dying.[4] Anaemia is a challenge for anaesthetics and anaesthesiologists as haemoglobin is one of the clinical parameters that determine anaesthesiology choice and service delivery to the patient.[5] There has been debate by scholars on the management of anaemia in the critically ill patients in the recent times.[4] There has been a gradual shift from the liberal transfusion to the restrictive transfusion.[4] The causes of anaemia in patients managed at the ICU are complex and multifactorial. The pathophysiology of anaemia in ICU patients include, loss of red blood cells (RBCs) due to phlebotomy and bleeding from surgical site, trauma, venous access site, or gastrointestinal bleed.[4] In addition, anaemia in the ICU may be as a result of decreased production of RBC due to suppression of bone marrow secondary to inflammatory cytokines, drugs, functional or absolute erythropoietin deficiency due to renal dysfunction.[4,5] Furthermore, anaemia in ICU may be as a result of nutritional deficiency examples of which are iron. Folic acid, vitamin B 12 deficiency.[4] Researchers have also linked anaemia in the critically ill unit to increased destruction of RBC's (haemolysis) or RBC precursor in the bone marrow due to toxins and drugs.[4,5] This review outlines the prevalence of anaemia in the ICU of the Rivers State University Teaching Hospital.

### Aim:

To determine the prevalence of anaemia in ICU admissions at the Rivers State University Teaching Hospital (RSUTH).

## METHODOLOGY

This was a one-year retrospective study conducted at ICU of RSU. All consecutive patients admitted in the ICU were involved in the study. The cut-off for anaemia was Packed Cell Volume ≤33%. Information were analysed with SPSS version 25.

**Inclusion Criteria:** All patients 18 years and above.

**Exclusion Criteria:**
Patients below 18 years
Haemoglobinopathies – Sickle cell disease.
Patients on treatment for anaemia were excluded.
Haemolytic anaemia as a direct cause of admission in ICU.

## RESULTS

Ninety-seven subjects were evaluated under year review. There were 38 (29.2%) males and 59 (60.8%) females. The age range was between 14 to 87 years with the modal age of 30 years. There were 44 (45.4%) patients that had medically related conditions while 53 (54.6%) were surgically related. Subjects with PCV <33% were 28 (28.8%) of which females were 21 (21.6%) and male 7 (7.2%).

**Table 1** Summary of results

| | |
|---|---|
| **Number Subjects** | **97** |
| **Males** | 38 |
| **Females** | 59 |
| **Age Range (years)** | 19 to 87 |
| **Modal age** | 30 |
| **Medically related conditions** | 44 |
| **Surgically related conditions** | 53 |
| **Prevalence of anaemia (%)** | 28 |

**Table 2:** Sex Distributions

| Sex | Number (n) | Percentage (%) |
|---|---|---|
| **Male** | 38 | 29.2 |
| **Female** | 59 | 60.8 |
| **Total** | 97 | 100 |

**Table 3:** Distribution of Patients into Medical or Surgical conditions

| Distribution of Patients | Number (n) | Percentage (%) |
|---|---|---|
| **Medical** | 44 | 45.4 |
| **Surgical** | 53 | 54.6 |
| **Total** | 97 | 100 |

**Table 4:** Sex Distribution of Anaemia

| Anaemia | Number (n) | Percentage (%) |
|---|---|---|
| **Male Sex** | **7** | **7.2** |
| **Female** | **21** | **21.6** |
| | **28** | **28.8** |

**Conflict of interest:** Authors have declared that there was no conflict of interest.

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**Ethics:** Guidelines in line with Helsinki's declaration (revised 13th edition).

## DISCUSSION

This study revealed the prevalence of anaemia in patients admitted in the intensive care unit (ICU) patients at the Rivers State University Teaching Hospital as 28.8% (tables 1,4). This figure was lower than that obtained in a retrospective study by Wubet HB et al 422 surgical intensive care patients who had elective surgery were follow-up and showed that 69.9% had anaemia.[4] The drawback to this comparison was that this study involved patients that had their packed cell volume after surgery. Most probably the level of anaemia could have been lower with level of packed cell volume done prior to surgery or before optimising them before surgery.

Our study revealed that there was sex variation amongst patients managed in ICU of the Rivers State University Teaching Hospital. Anaemia was commoner amongst the females 21.6% as compared to the males 7.2% (table 4). There may several reasons for this disparity. One of the reasons may be based on the proportion of the sex of the patients managed at the ICU in this study. The number of males managed for the period under review were 29.2% compared to 60.8% of the females, invariably the proportion of the females with anaemia may expected to be higher than those of the males. In addition to this, taking into consideration of the physiology of blood loss during menstruation and the underlying morbidities the percentage of anaemia in the females is expected to be higher than the males. However, there is paucity of data to back the variability of anaemia in males and females in the ICU.[6,7] In the research conducted by Merdji H et al that there were greater proportions of men than women managed at the ICU, this was not in agreement with our study.[8] In a research conducted by Todoror et al demonstrated that in a data base of ratio 450:948 cardiovascular and neurovascular patient admitted at ICU the percentage of women were significantly lower compared to men.[79]

## CONCLUSION

The prevalence of anaemia at ICU of the Rivers State University was 28.8%. The prevalence of anaemia was higher in females compared to males. Patients should be optimized for better outcomes. Anaemia is a challenge for anaesthetics and anaesthesiologists as haemoglobin is one of the clinical parameters that determine anaesthesiology choice and service delivery to the patient.

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