The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 6, 2025

FREQUENCY OF ANEMIA IN PATIENTS AT PRESENTATION AND THREE DAYS AFTER ADMISSION TO MEDICAL INTENSIVE CARE UNIT

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DOI: https://doi.org/10.5281/zenodo.15710754

Keywords
anemia, intensive care unit, ICU, hemoglobin, critical illness, hemodilution, blood loss, patient outcomes

Article History
Received on 14 May 2025
Accepted on 14 June 2025
Published on 21 June 2025

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Abstract
Anemia is a common condition among patients admitted to the medical intensive care unit (ICU), and its prevalence may increase during the course of hospitalization. This study aims to evaluate the frequency of anemia in patients at the time of admission to the ICU and three days post-admission, to identify any significant changes and to explore potential contributing factors. The study found that the frequency of anemia was significantly higher after three days of ICU admission, highlighting the need for better monitoring and management of hemoglobin levels in critically ill patients.

INTRODUCTION

Anemia is defined as a hemoglobin level lower than the normal reference range, typically below 13 g/dL for men and below 12 g/dL for women. It is a prevalent condition that can adversely affect the clinical outcomes of patients, especially those in critical care settings [1,2]. Patients in the medical ICU are at heightened risk for anemia due to various factors, including chronic disease, blood loss, hemodilution, and the effects of medications or medical procedures [3,4].

The frequency of anemia at the time of ICU admission and its subsequent development over the course of hospitalization has not been extensively studied, especially in the early days of ICU stay. This research focuses on the frequency of anemia in patients at admission and three days after admission to the ICU, with the hypothesis that the incidence of anemia increases over this time period [5]

Materials and Methods:

This study was conducted in the medical ICU of Federal Govt. Polyclinic Islamabad. A cohort of 100 consecutive patients admitted to the ICU was included. The inclusion criteria were adult patients (aged 18 years and above) who were admitted to the ICU for various medical conditions. Patients with pre-existing anemia, chronic hematologic disorders, or those requiring immediate surgical intervention were excluded[6].

Hemoglobin levels were measured for each patient at the time of admission to the ICU (Day 0) and again three days later (Day 3). The hemoglobin levels were categorized as follows:

- Mild Anemia: Hemoglobin between 10 and 12 g/dL
- Moderate Anemia: Hemoglobin between 7 and 9 g/dL
- Severe Anemia: Hemoglobin below 7 g/dL

- No Anemia: Hemoglobin greater than or equal to 12 g/dL for men, 11 g/dL for women[7].

The frequency of anemia at both time points (admission and Day 3) was recorded and analyzed. A statistical analysis was performed using paired t-tests to compare the hemoglobin levels at the two time points, and chi-square tests were used to assess the prevalence of anemia in each group[8].

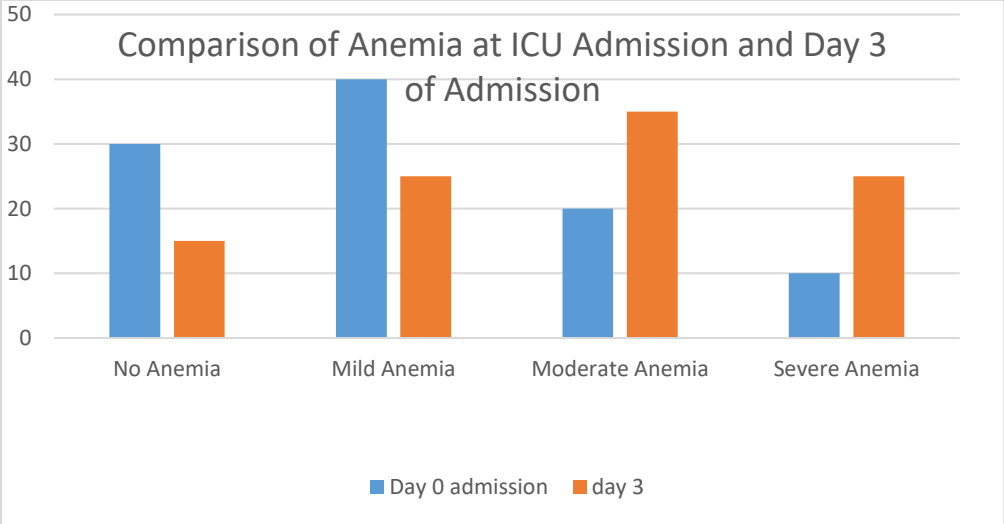
Results:

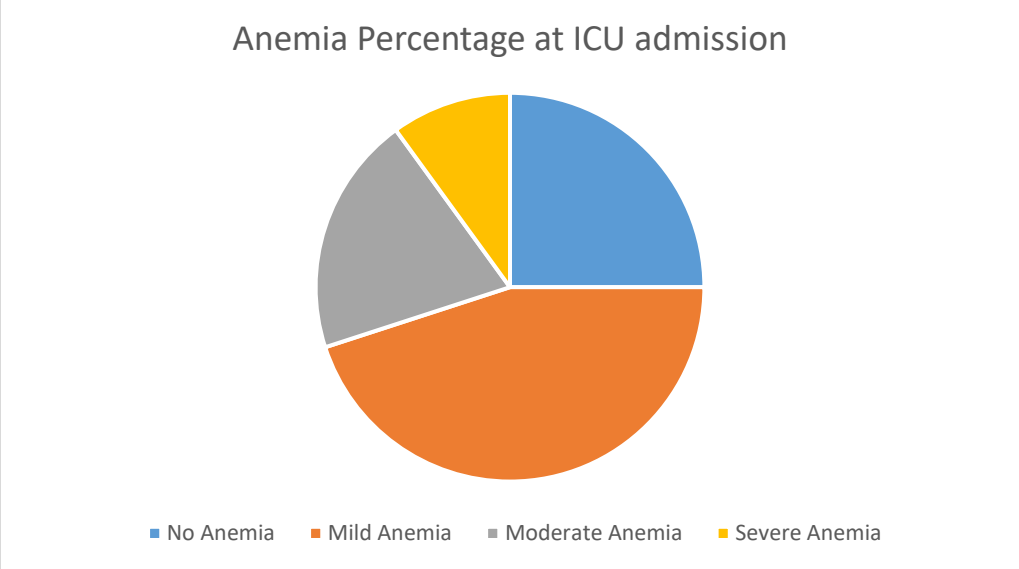
Of the 100 patients included in the study, 60 were male and 40 were female. The average age was 62 years (range 21–85 years). At the time of ICU admission, 30% of patients (n=30) had no anemia, 40% (n=40) had mild anemia, 20% (n=20) had moderate anemia, and 10% (n=10) had severe anemia.

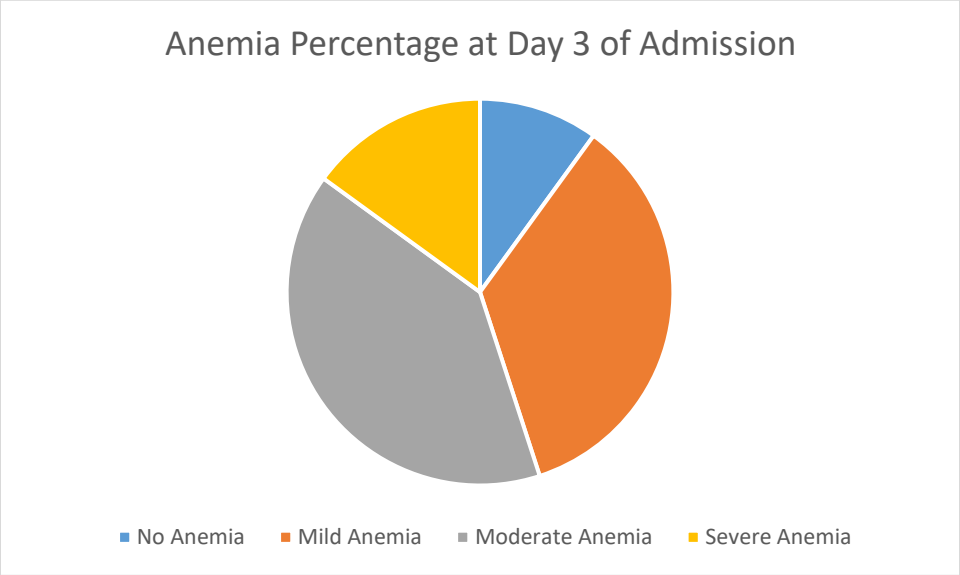
At Day 3, the distribution of anemia severity was as follows:

- 15% (n=15) had no anemia
- 25% (n=25) had mild anemia
- 35% (n=35) had moderate anemia
- 25% (n=25) had severe anemia

Statistical analysis showed a significant increase in the frequency of anemia from 70% at admission to 85% by Day 3 ($p<0.05$). Furthermore, the proportion of patients with severe anemia increased significantly, from 10% at admission to 25% by Day 3 ($p<0.05$). This suggests that anemia worsens during the initial days of ICU admission[9,10].







Discussion:

The results of this study demonstrate a significant increase in the frequency and severity of anemia among patients during the first three days of their ICU stay. Several factors contribute to this phenomenon, including hemodilution due to intravenous fluid administration, blood loss from diagnostic or therapeutic procedures, and the underlying critical illness that can exacerbate pre-existing anemia[11]. Additionally, the effects of medications such as blood thinners or antiplatelet agents, which are commonly used in ICU patients, can contribute to an increased risk of bleeding and subsequent anemia[12,13].

Anemia in the ICU is known to have several detrimental effects, including reduced oxygen delivery to tissues, increased fatigue, and a higher risk of complications such as infections, organ dysfunction, and prolonged mechanical ventilation[14]. Our study highlights the need for early identification and management of anemia in critically ill patients to improve outcomes. It is crucial to regularly monitor hemoglobin levels during the first few days of ICU admission and address any contributing factors[15,16].

Furthermore, several studies suggest that early interventions such as blood transfusions, erythropoiesis-stimulating agents, or iron supplementation may help mitigate the progression of anemia in critically ill patients[17,18]. However, the potential risks of these treatments, such as transfusion reactions or adverse effects of iron supplementation, should be considered on a case-by-case basis [19,20].

Conclusion: The frequency of anemia increases significantly within the first three days of ICU admission. This study underscores the importance of vigilant monitoring of hemoglobin levels in critically ill patients, as well as the need for timely interventions to address anemia and prevent its worsening. Further research should explore the underlying causes of anemia in the ICU setting and evaluate the efficacy of various interventions, such as blood transfusions, erythropoiesis-stimulating agents, and iron supplementation[21].

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