



At a Hospital that Provides Tertiary Care, the Prevalence of Anemia among Leukaemia Patients is Examined.

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ABSTRACT:

Anemia is a common and often under-recognized complication in cancer patients. It may arise from various factors, including chronic disease, chemotherapy, radiation, or tumor-related blood loss. Anemia in cancer patients is associated with increased fatigue, reduced quality of life, and impaired response to treatment. Despite its clinical significance, the prevalence and impact of anemia among cancer patients in specific healthcare settings, such as tertiary care hospitals, require further investigation.

INTRODUCTION

Anemia is a common and important problem in patients with cancer. Anemia is a condition that develops when there are no sufficient healthy red blood cells, which is characterized either by a reduction in red blood cells (RBCs) or less than the normal quantity of hemoglobin (Hb) in the blood; a lack of oxygen-carrying RBCs; or a lack of oxygen delivery to tissues. Different cutoff values of Hb have been given to define anemia depending on gender and age [1,2,3,4]. Most commonly, the World Health Organization (WHO) definitions are used to define the cutoff Hb level in women as 12 g/dL and in men as 13 g/dL [5]. When using a cutoff value of Hb of 12 g/dL for both men and women. Cancer is one of the most frequent conditions associated with anemia of chronic disease; meantime, anemia is a common complication of cancer [5]. The estimated prevalence of anemia varies ranging from 30% to 90% of cancer patients with different stages of disease and treatment [2,6,7]. Cancer continues to emerge as a prominent global cause of mortality [8]. The incidence and death rates have witnessed a worrisome upward trajectory, with more than 19 million new cases and 609,820 deaths reported in 2023. This reflects a significant increase of more than 5 million cases and 2 million deaths compared to the statistics reported in 2012 [9,10]. Unfortunately, these figures are projected to

escalate further to an estimated 23.6 million new cases by 2030 [10]. Reasons for anemia in cancer patients are decreased production of RBCs resulting from nutritional deficiencies; insufficient production of [2] RBCs because of the presence of chronic disease; a blunted response to erythropoietin (EPO); bone marrow infiltration by the tumor or bone marrow suppression resulting from anticancer treatment such as surgery, chemotherapy, or radiotherapy; and increased loss of RBCs caused by blood loss from the tumor, surgery, or hemolysis [11,12].

INVESTIGATION-

Leukemia is a cancer of the blood-forming tissues, primarily the bone marrow and lymphatic system, and leads to the overproduction of abnormal white blood cells. There are several types of leukemia, classified based on how fast the disease progresses (acute or chronic) and the type of blood cell affected (lymphoid or myeloid).

Here's a breakdown of the main types of leukemia:

◆ 1. Acute Lymphoblastic Leukemia (ALL)

- Onset: Rapid and aggressive.
- Cell type: Immature lymphoid cells (lymphoblasts).



- Most common in: Children (most common childhood cancer), but can also occur in adults.
- Symptoms: Fatigue, fever, bleeding/bruising, bone pain, frequent infections.
- Treatment: Chemotherapy, radiation, stem cell transplant, targeted therapy.

◆ 2. Acute Myeloid Leukemia (AML)

- Onset: Rapid and severe.
- Cell type: Immature myeloid cells (myeloblasts).
- Most common in: Adults (especially older adults), can occur in children.
- Symptoms: Anemia, bleeding, infections, fatigue.
- Treatment: Intensive chemotherapy, stem cell transplant.

◆ 3. Chronic Lymphocytic Leukemia (CLL)

- Onset: Slow, may take years to show symptoms.
- Cell type: Mature lymphocytes, usually B-cells.
- Most common in: Older adults (rare in people under 40).
- Symptoms: Often asymptomatic early on; later, fatigue, swollen lymph nodes, weight loss.
- Treatment: Watchful waiting, targeted therapies, chemotherapy, immunotherapy.

◆ 4. Chronic Myeloid Leukemia (CML)

- Onset: Slow, may accelerate over time.
- Cell type: Mature and maturing myeloid cells.
- Most common in: Adults, typically middle-aged.
- Key feature: Presence of Philadelphia chromosome (BCR-ABL fusion gene).
- Symptoms: Fatigue, weight loss, night sweats, enlarged spleen.
- Treatment: Targeted therapy (e.g., tyrosine kinase inhibitors like imatinib).

Other Rare Types of Leukemia:

◆ Hairy Cell Leukemia (HCL)

- Rare, slow-growing cancer of B cells.
- Cells have "hair-like" projections under the microscope.
- Treated with chemotherapy or immunotherapy.

◆ Juvenile Myelomonocytic Leukemia (JMML)

- Rare, aggressive leukemia in young children.
- Shares features of both AML and CML.
- Often requires stem cell transplant.

Quick Comparison Chart

Type	Progression	Affected Cell	Common Age Group
ALL	Acute (fast)	Lymphoid (immature)	Children
AML	Acute (fast)	Myeloid (immature)	Adults
CLL	Chronic (slow)	Lymphoid (mature B-cells)	Older adults
CML	Chronic (slow→fast)	Myeloid (mature)	Adults

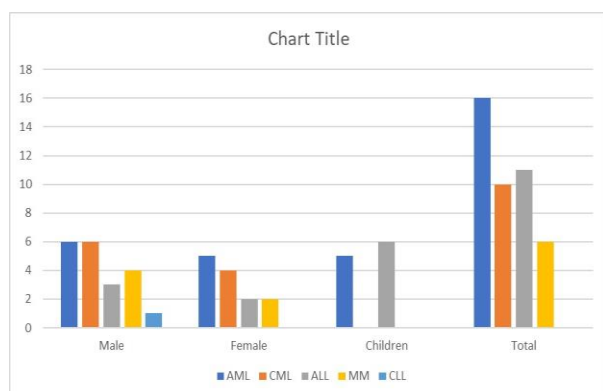
MATERIAL AND METHODS-

A cross-sectional study was conducted at [School of health sciences CSJMU Kanpur and GSVM Medical College Kanpur for complete investigation] over a period of [6 Months]. A total of [sample size 100] cancer patients, both inpatients and outpatients, were included in the study. Data were collected through patient records and clinical assessments. Hemoglobin levels were measured, and anemia was classified according to the World Health Organization (WHO) criteria. Additional demographic and clinical information such as cancer type, stage, chemotherapy history, and nutritional status were recorded. Statistical analysis was performed to determine the prevalence of anemia and its association with various risk factors.



RESULT

The overall prevalence of anemia among cancer patients was found to be [percentage]%. A higher prevalence was noted among patients undergoing chemotherapy ([percentage]%) and those with advanced-stage cancers ([percentage]%). Patients with gastrointestinal cancers had the highest rates of anemia. The most common severity of anemia was mild to moderate. Statistically significant associations were observed between anemia and factors such as age, type of cancer, stage of disease, chemotherapy, and nutritional deficiencies.



CONCLUSION-

Anemia is highly prevalent among cancer patients, particularly those undergoing chemotherapy or with advanced-stage disease. Early screening and targeted interventions for anemia are essential to optimize treatment outcomes and enhance the quality of life of cancer patients. Further studies are needed to explore the underlying mechanisms and evaluate the effectiveness of different management strategies for anemia in this patient population.

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