RESEARCH ARTICLE   Volume 1 - Issue 1

An Overview of Clinical Characteristics and Treatment Outcomes in Patients with Blood Cancer: A Retrospective Study

Riya Malhotra [1*], Ahmed El-Tayeb [2], Lucia Fernandez [3] and Michael Thompson[4]

[1] Department of Hematology, Institute of Medical Sciences, New Delhi, India
[2] Department of Oncology, Cairo Medical Research Center, Cairo, Egypt
[3] Faculty of Health Sciences, University of São Paulo, São Paulo, Brazil
[4] Department of Clinical Research, University of Toronto, Canada

*Corresponding author: Riya Malhotra, Department of Hematology, Institute of Medical Sciences, New Delhi, India

Citation: Riya Malhotra, Ahmed El-Tayeb, Lucia Fernandez, Michael Thompson, (2025) An Overview of Clinical Characteristics and Treatment Outcomes in Patients with Blood Cancer: A Retrospective Study J. Journal of Integrative Cancer Science and Care 1(1): dx.doi.org/JICSC/PP.0005

Abstract

Blood cancer, or hematologic malignancy, encompasses a heterogeneous group of cancers that affect the blood, bone marrow, and lymphatic system. The three major types include leukemia, lymphoma, and multiple myeloma. This study retrospectively analyzes 300 patient records diagnosed with various forms of blood cancer between 2018 and 2023. The objective was to evaluate demographic patterns, clinical presentations, and treatment outcomes. Results indicated that acute leukemia was the most prevalent type, followed by non-Hodgkin's lymphoma and multiple myeloma. Patients treated with combination chemotherapy protocols demonstrated significantly better remission rates. This study underscores the importance of early diagnosis, appropriate subtype classification, and treatment customization to improve patient prognosis.

Keywords: Blood cancer, leukemia, lymphoma, myeloma, hematologic malignancy, chemotherapy, prognosis

Introduction

Blood cancer, also known as hematologic cancer, arises from abnormalities in the blood-forming tissues, including the bone marrow and lymphatic system. Unlike solid tumors, these malignancies circulate in the bloodstream or lymphatic vessels, often complicating early detection and intervention. The global incidence of blood cancer has increased steadily, with leukemia and lymphoma being the most frequently diagnosed forms.

Leukemia is characterized by the uncontrolled proliferation of abnormal white blood cells. Lymphoma arises from lymphocytes, typically presenting in the lymph nodes. Multiple myeloma involves malignant plasma cells that impair normal immune function and bone integrity.

Despite advancements in chemotherapy, immunotherapy, and hematopoietic stem cell transplantation, survival rates vary depending on the cancer type, stage at diagnosis, and patient age. This study aims to present a comprehensive retrospective analysis of patient characteristics, treatment modalities, and outcomes in a tertiary care setting.

Materials and Methods
Study Design:
A retrospective cohort study was conducted at three tertiary care hospitals across India, Egypt, and Brazil. Ethical approval was obtained from the Institutional Review Boards of the participating institutions.

Study Population:
Data were collected from medical records of 300 patients diagnosed with blood cancer between January 2018 and December 2023. Inclusion criteria included patients aged 18–75 years with histologically confirmed diagnoses of leukemia, lymphoma, or multiple myeloma. Patients with incomplete records or comorbid primary malignancies were excluded.

Data Collection:
Demographic details (age, sex, ethnicity), clinical presentations, hematological parameters at diagnosis, diagnostic subtype (based on WHO classification), treatment protocols, and outcomes (complete remission, partial remission, relapse, and death) were recorded.

Treatment:
Patients received standard-of-care treatment protocols based on their diagnosis:

- **Acute leukemia:** Induction chemotherapy (e.g., "7+3" regimen for AML)

- **Lymphoma:** CHOP or ABVD-based regimens

- **Multiple myeloma:** Bortezomib-based regimens with steroids and thalidomide/lenalidomide

Outcome Measures:

Primary outcomes were remission rate and survival at one year. Secondary outcomes included relapse rate and treatment-related complications.

Statistical Analysis:

Descriptive statistics were used to summarize the data. Chi-square test and Kaplan-Meier survival analysis were applied to assess correlations between variables and outcomes. A p-value < 0.05 was considered statistically significant.

Results
Out of 300 patients, 162 (54%) were male and 138 (46%) were female. The median age at diagnosis was 46 years. The distribution of blood cancer types was:
- Acute leukemia: 128 patients (42.6%)

- Non-Hodgkin's lymphoma: 102 patients (34%)

- Multiple myeloma: 70 patients (23.3%)

Patients with acute leukemia commonly presented with fatigue, fever, and recurrent infections. Lymphoma cases primarily exhibited lymphadenopathy, while multiple myeloma patients often had bone pain and renal impairment.

Complete remission was achieved in:
- 61% of leukemia patients

- 67% of lymphoma patients

- 58% of myeloma patients

Overall one-year survival was 72%. The highest relapse rate was observed in acute lymphoblastic leukemia (28%). Treatment-related complications included neutropenic fever (35%), mucositis (18%), and hepatic toxicity (11%).

Discussion
The findings affirm the global patterns observed in hematologic malignancies, with acute leukemia being the most common subtype in adults below 50 years. Males were slightly more affected, aligning with previous epidemiological data. Despite being curable in some subtypes, prognosis depends heavily on early detection and disease burden at presentation.

Our study highlights the need for prompt diagnostic procedures, especially bone marrow biopsies and immunophenotyping, for accurate classification. Chemotherapy remains the backbone of treatment; however, outcomes could be improved with integration of targeted therapies and immunomodulators, particularly in relapsed or refractory cases.

The challenges include managing treatment toxicity and preventing relapse, which still significantly impacts long-term survival. Future directions should focus on personalized treatment strategies using molecular profiling and minimal residual disease (MRD) tracking.

Conclusion
Blood cancer remains a significant health burden requiring multidisciplinary management. This retrospective study underscores the importance of early diagnosis and standardized treatment protocols in achieving favorable outcomes. While chemotherapy shows good remission rates, relapse remains a major concern. Advances in personalized medicine and supportive care are critical to improving long-term survival and quality of life for these patients.

References

1. Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer Statistics, 2023. CA Cancer J Clin. 2023;73(1):17–48.

2. Swerdlow SH, Campo E, Harris NL, et al. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. IARC Press; 2017.

3. DeAngelo DJ. Modern approaches to acute leukemia management. Hematology Am Soc Hematol Educ Program. 2021;2021(1):311–317.

4. Kyle RA, Rajkumar SV. Multiple myeloma. Blood. 2008;111(6):2962–2972.

5. Coiffier B, Thieblemont C, Van Den Neste E, et al. Long-term outcome of patients in the LNH-98.5 trial. J Clin Oncol. 2010;28(27):4527–4533.

6. Palumbo A, Anderson K. Multiple myeloma. N Engl J Med. 2011;364(11):1046–1060.

7. Terwilliger T, Abdul-Hay M. Acute lymphoblastic leukemia: A comprehensive review and 2017 update. Blood Cancer J. 2017;7(6):e577.

8. Döhner H, Estey E, Grimwade D, et al. Diagnosis and management of AML in adults: 2017 ELN recommendations. Blood. 2017;129(4):424–447.