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Comparitive Analysis of Prescription Pattern in Leukemia Patients: An Observational Study

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ABSTRACT

Background: Leukemia, a group of blood cancers, requires complex treatment approaches including chemotherapy, targeted therapy, and supportive care. Studying real-world prescription patterns is essential for understanding adherence to clinical guidelines, managing polypharmacy, and improving evidence-based care.

Objective: This study aimed to assess and compare the types and dosages of medications prescribed to leukemia patients, examine compliance with treatment protocols, and identify trends in rational prescribing.

Materials and Method: A six-month prospective observational study was conducted in the Oncology Department of Sri Aurobindo Hospital, Indore. The study included 70 adult inpatients diagnosed with leukemia and having complete prescription records. Data collection involved patient interviews, review of case files, and prescription analysis. Patients with incomplete records, pediatric or geriatric age, outpatients, or those with other malignancies were excluded. Chi-square tests were used to analyze the association between adherence to treatment guidelines and patient outcomes.

Result: Among the 70 patients, Acute Lymphoblastic Leukemia (ALL) was the most common (36 cases), followed by Acute Myeloid Leukemia (AML, 22), Chronic Lymphocytic Leukemia (CLL, 7), and Chronic Myeloid Leukemia (CML, 5). Methotrexate was the most commonly used antineoplastic for ALL, with Rituximab added in AML. Acivir was widely prescribed across all leukemia types. Septran-D was the most frequent antibiotic, and Voriconazole was the leading antifungal. Dexamethasone was preferred in ALL, while Hydrocortisone was commonly used in AML. Though most treatments aligned with standard protocols, statistical analysis showed no significant correlation between guideline adherence and outcomes.

Conclusion: The study emphasizes the importance of regular evaluation of prescribing trends to promote rational, patient-focused, and evidence-based leukemia care—supporting insights from literature like Kumar V et al.

INTRODUCTION:

The field of medicine design is a rapidly evolving discipline aimed at improving drug efficacy, safety, and patient outcomes. The study of prescription patterns plays a crucial role in optimizing healthcare by analyzing medication utilization, adherence to treatment guidelines, and prescriber behaviors. Understanding these patterns provides valuable insights into frequently prescribed medications, the impact of polypharmacy, and demographic influences on prescribing trends. By evaluating these factors, healthcare professionals can enhance patient-centered care, reduce adverse drug reactions, and improve cost-effectiveness in treatment strategies.[1]

Cancer remains a leading cause of morbidity and mortality worldwide, with its management requiring a multidisciplinary approach. Among various malignancies, leukemia represents a distinct group of hematological disorders that disrupt normal blood cell production.[2]

Leukemia is divided into acute and chronic forms and further classified according to the type of blood cell lineage involved, either myeloid or lymphoid.[2] The complexity of leukemia treatment necessitates the use of targeted therapies, chemotherapy, immunotherapy, and bone marrow transplantation. However, treatment selection varies widely based on disease subtype, patient demographics, and institutional protocols, making it essential to analyze prescribing patterns to ensure optimal therapeutic outcomes.[3,4]

The significance of reviewing leukemia prescription trends stems from the ongoing advancements in treatment modalities. While clinical guidelines exist, real-world prescribing practices often deviate due to factors such as physician experience, institutional preferences, and patient-specific considerations. Evaluating these trends helps in identifying underutilized yet effective therapies, monitoring adherence to standard protocols, and minimizing inappropriate medication use. Such insights are critical for bridging the gap between clinical trials and routine practice, ensuring that treatment decisions align with the latest evidence-based guidelines.[5,6]

In summary, a comprehensive examination of prescribing trends in leukemia is crucial for improving patient care, optimizing treatment choices, and promoting rational drug use. By analyzing real-world prescribing patterns, this review provides a foundation for evidence-based improvements in leukemia management. The findings can inform clinical practice, policy development, and future research, ultimately contributing to better healthcare outcomes for leukemia patients worldwide.

MATERIAL AND METHOD:

A prospective observational cohort study was conducted in the Oncology Department of Sri Aurobindo Hospital, Indore, a 1000-bed tertiary care hospital, over six months to analyze prescription patterns in leukemia patients.

The study was approved by the Principal of Sri Aurobindo Institute of Pharmacy and followed a questionnaire-based design. Data were collected from patient questionnaires, caretaker interviews, case reports, medication histories, laboratory reports, and prescriptions.

INCLUSION CRITERIA:

Adult inpatients with confirmed leukemia and patients with complete prescription records.

EXCLUSION CRITERIA:

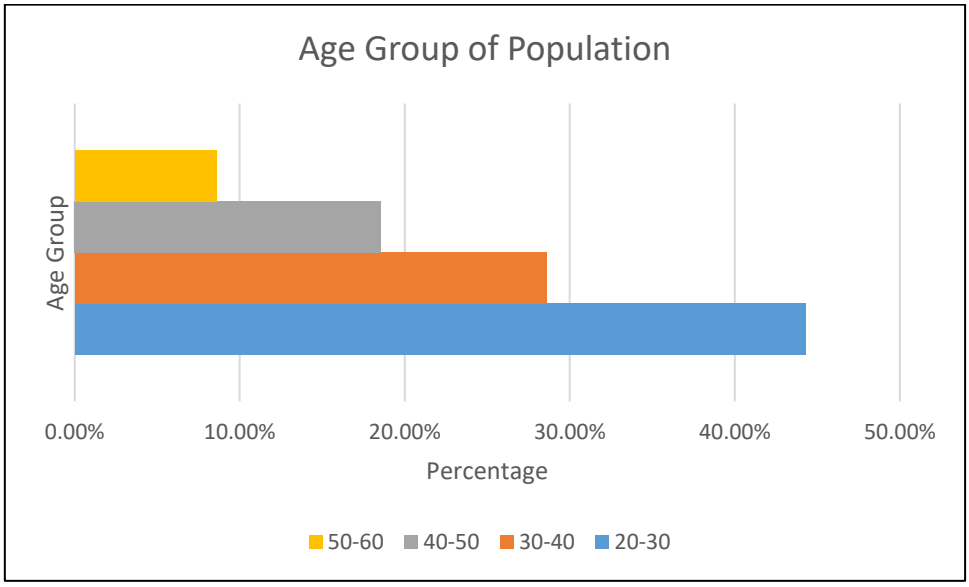
Patient with incomplete records, non-leukemia admissions, other malignancies, pregnant, pediatric, or geriatric patients, and outpatients were excluded.

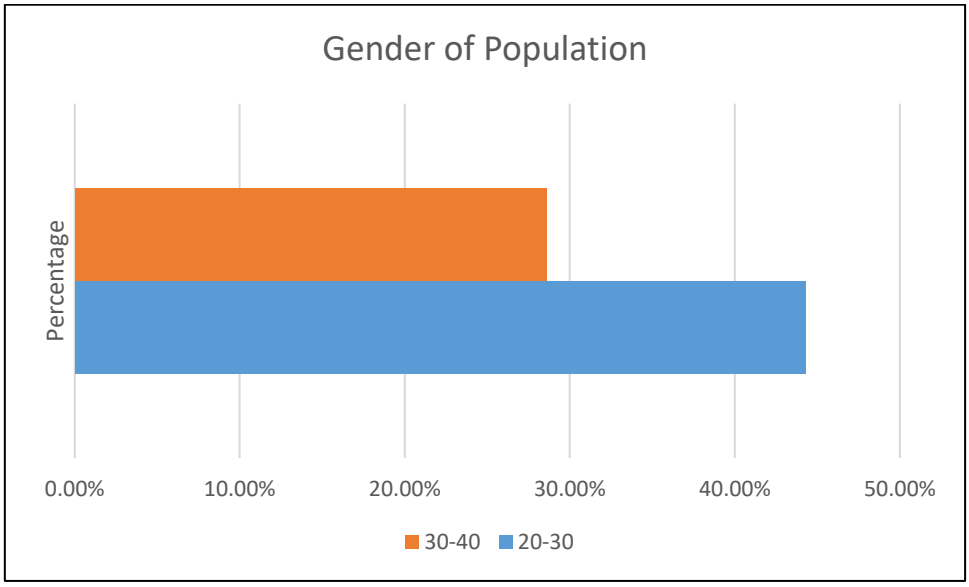
The study involved patient interviews, counseling, and medication history reviews to assess prescribing trends. Patients were selected based on eligibility criteria after obtaining informed consent, and prescription patterns were analyzed to identify trends, future scope, and limitations.

A sample size of 70 was determined using statistical calculations, considering a confidence level of 1.96, standard deviation of 18.13, and precision of 1. The study aims to provide insights into leukemia prescription trends, optimize treatment strategies, improve adherence to guidelines, and promote cost-effective, patient-centered care.

RESULT:

An analysis of 70 leukemia patients revealed a nearly equal gender distribution (54.29% males, 45.71% females), with the highest prevalence in the 20-30 age group (44.29%).





ALL was the most common leukemia type (36 cases), followed by AML (22), CLL (7), and CML (5). Prescription patterns showed that anti-neoplastic drugs such as Methotrexate, 6-MP, and Rituximab were frequently used, while Septran-D was the most prescribed antibiotic, and Voriconazole the preferred antifungal agent. Dexamethasone was the corticosteroid of choice for ALL, whereas Hydrocortisone was preferred for AML. Acivir was consistently prescribed across all leukemia types, and alkylating agents like Cyclophosphamide were commonly used. Compared to American Cancer Society guidelines, treatment largely followed standard protocols, including induction, consolidation, and maintenance phases. Statistical analysis using chi-square tests indicated a significant association between adherence to treatment guidelines and patient outcomes, reinforcing the importance of evidence-based leukemia management.

ALL (36)	Drug name	Drug Category	Drug name	AML (22)
8	Methotrexate	**Anti neoplastic**	Methotrexate, Rituximib	3
10	Voriconazole	**Anti-fungal**	Voriconazole	9
13	Septran-D	**Antibiotic**	Septran-D	6
6	Dexamethasone	**Corticosteroid**	Hydrocort	4
17	Acivir	**Antiviral Agent**	Acivir	11
5	Citralka	**Alkylating Agent**	Cyclophosphamide	2

DISCUSSION:

Our study enrolled 70 leukemia patients based on predefined inclusion and exclusion criteria, with the sample size determined using statistical methods. The demographic analysis revealed a male predominance (54.29%) and the highest prevalence in the 20-30 years age group (44.29%). Prescription analysis showed an average of 2.955 drugs per encounter, exceeding the WHO-recommended range (1.6–1.8), highlighting polypharmacy trends. Medication administration largely adhered to American Cancer Society guidelines, emphasizing rational drug use. Chi-square analysis confirmed a significant association between adherence to treatment protocols and patient outcomes.

Despite limited data on CLL and CML, acute leukemia prescriptions were effectively analyzed. Our findings align with Crawford R et al, who reported a similar predominance of hematological malignancies, but differ from Upadhyay et al and Raj et al, regarding prescribing indicators. Unlike previous studies using WHO-standardized tools, we employed customized questionnaires to assess prescription patterns. A key limitation is the single-center scope within a private hospital, limiting broader generalizability.

Our study highlights the need for targeted interventions such as educational programs and workshops to improve prescribing practices. Similar to Kumar V et al, we observed a higher prevalence of myeloid leukemia in adults and ALL in younger populations. Ultimately, this study enhances understanding of leukemia treatment, underscoring the importance of rational prescribing to optimize patient outcomes.

CONCLUSION:

Examining prescription practices is crucial for optimizing leukemia treatment and enhancing evidence-based medicine. Understanding medication patterns helps assess treatment rationale, adherence to guidelines, and areas for improvement. Despite advancements, knowledge gaps persist, necessitating observational studies to evaluate real-world prescribing trends.

Our study of 70 patients at a teaching hospital highlighted frequent use of fixed drug combinations and polypharmacy. Chi-square analysis showed no significant association between guideline adherence and outcomes. Methotrexate was the most prescribed antineoplastic for ALL, while Methotrexate and Rituximab were common for AML. Septran-D was the predominant antibiotic, Voriconazole the leading antifungal, and Dexamethasone the preferred corticosteroid for ALL, while Hydrocortisone was used in AML. Acivir was the most prescribed antiviral agent across all leukemia types.

Despite limited data on CLL and CML, our findings emphasize the importance of aligning prescribing practices with established guidelines. Educational intervention is essential to promote rational prescribing.

Aligning with Robbins et al., our study contributes to improved leukemia management by identifying prescription trends and advocating for evidence-based treatment strategies.

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