

# Clinical Manifestations In Patients With Acute Leukaemias In Rwanda

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## Abstract:

Acute leukaemia is characterized by uncontrolled expansion of immature leukocytes, either myeloid or lymphoid progenitors, leading to acute myeloid leukaemia (AML) and acute lymphoid leukaemia (ALL), respectively. If left untreated, it is life-threatening and can lead to death within weeks. Acute leukemias are highly malignant neoplasms and are responsible for a large number of hematopoietic cancer related deaths. The clinical presentation of acute leukemia results from infiltration of bone marrow or extra-medullary sites by blasts, as a result initial symptoms may be due to presence of anemia, neutropenia or thrombocytopenia

**Objective:** the aim of this study was to look into demographic features and clinical manifestations of acute leukemia in Rwanda.

**Methods :** A total of 112 consecutive acute leukemia cases (including 69 AML cases and 43 ALL cases), which were received at the Department of Hematology of King Faisal Hospital (Kigali, Rwanda) and Butaro Level II Teaching Hospital between January 2019 and December 2023, were reviewed. This was a cross-sectional and retrospective study where the recorded data of patients who were tested from 2019 to 2021 was checked by observing their result. Data collected was checked for completeness, entered, and analyzed using Microsoft excel and statistical package for social sciences (SPSS version 22).

**Results:** In a total of 112 patients of AML belonging to all age groups, 64 (57%) were males and 48(43%) were females with male to female ratio of 1.3:1. Age ranged from 2 years to 90 years with a mean age of 36.2 years. Among them 24 (21%) were below the age of 16 years and 88 (79 %) were more than 16 years with adult to children ratio of 3.7:1.

AML cases are 69 (61.6%) and ALL cases are 43(38.4%). Among 24 patients aged below 16 years old 15(62.5%) had acute myeloid leukaemia and 9(37%) had acute lymphoblastic leukaemia; while among 88 adults patients with leukaemia 60(68.2%) had acute myeloid leukaemia and 28(31.8%) had acute lymphoblastic leukaemia. Adults represent 86.9% (60/69) and children represent only 13.1% (9/69) of all AML cases. The most common presenting clinical manifestations in patients with acute leukaemia in general were Bruising/Bleeding, fever, Shortness of breath, infection, hepatosplenomegaly and lymphadenopathy seen in 39%, 37%, 29%, 28%, 18%, and 17% respectively. The most common clinical manifestations in acute myeloid leukaemias were Bruising/Bleeding, fever, Shortness of breath, infections and Hepatosplenomegaly seen in 42.0%, 40.5%, 34.8%, 26.0% and 21.7%. While in patients with acute lymphoblastic leukaemia the most common clinical manifestations were Bruising/Bleeding(34.8%), and 30.2% with lymphadenopathy, infections and fever.

**Conclusion:** Disrupted hematopoiesis in acute leukaemias leads to the most common presenting manifestations, such as shortness of breath, infection, and bleeding tendency. Among study participants, majority presented with bruising/bleeding, infections, fever and shortness of breath and organomegaly.

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## I. Introduction

Acute leukaemia is characterised by uncontrolled expansion of immature leukocytes, either myeloid or lymphoid progenitors, leading to acute myeloid leukaemia (AML) and acute lymphoid leukaemia (ALL), respectively. If left untreated, it is life-threatening and can lead to death within weeks. Acute leukemias are highly malignant neoplasms and are responsible for a large number of hematopoietic cancer related deaths.

Although the survival rates have improved remarkably in the younger age group, the prognosis in older patients is still poor. The clinical presentation of acute leukemia results from infiltration of bone marrow or extramedullary sites by blasts, as a result initial symptoms may be due to presence of anemia, neutropenia or thrombocytopenia {1}.

Leukemia symptoms vary, depending on the type of leukemia. Common leukemia signs and symptoms include fever or chills, persistent fatigue, weakness, frequent or severe infections, losing weight without trying, swollen lymph nodes, enlarged liver or spleen, easy bleeding or bruising, recurrent nosebleeds, tiny red spots in the skin (petechiae), excessive sweating especially at night and bone pain or tenderness {2}.

Patient with leukemia experiences symptoms such as extreme fatigue, dizziness, or paleness and anemia {3} and blasts are bigger than normal white blood cells and have more trouble going through tiny blood vessels. If the blast count gets very high, these cells can clog up blood vessels and make it hard for normal red blood cells (and oxygen) to get to tissues. This is called leukostasis {4}.

A lack of platelets can lead to easy bruising, bleeding from the nose (epistaxis), small blood vessels on the skin (petechiae) or gums, or bleeding with minor trauma. Other symptoms may include fever, fatigue worse than what can be attributed to anaemia alone, weight loss and loss of appetite {5}. On the other hand, enlargement of the spleen may occur in AML, but it is typically mild and asymptomatic. Lymph node swelling is rare in most types of AML, except for acute myelomonocytic leukemia (AMML). The skin can be involved in the form of leukemia cutis; Sweet's syndrome; or non-specific findings: flat lesions (macules), raised lesion papules), pyoderma gangrenosum and vasculitis {6}.

Involvement of other parts of the body such as the gastrointestinal tract, respiratory tract and other parts is possible but less common. One area which has particular importance for treatment is whether there is involvement of the meninges around the central nervous system {7}. Palpable splenomegaly and hepatomegaly occur in about one third of patients. Bleeding can occur from nose, gums, gastrointestinal tract or urinary tract, or more commonly as petechial rash or easy bruisability. The severity correlates with degree of thrombocytopenia or presence of disseminated intravascular coagulation (DIC), most commonly observed in AML-M3. Bone pains occur in less than 20% of patients {8}.

AML is one of the most common types of leukemia in adults. Still, AML is fairly rare overall, accounting for only about 1% of all cancers. AML is generally a disease of older people and is uncommon before the age of 45. The average age of people when they are first diagnosed with AML is about 68. Acute lymphoblastic leukemia (ALL) is a cancer of the lymphoid line of blood cells characterized by the development of large numbers of immature lymphocytes. Accounting for the broad age profiles of those affected, ALL newly occurs in about 1.7 per 100,000 people per year. ALL represents approximately 20% of adults and 80% of childhood leukemias, making it the most common childhood cancer {9}.

A number of clinical and biologic factors affect the outcome and response to treatment in acute leukaemia patients. The chance of cure for a specific patient depends on a number of prognostic factors and therefore the aim of this study was to look into demographic features and clinical manifestations of acute leukemia in Rwanda.

## **II. Materials And Methods**

A total of 112 consecutive acute leukemia cases (including 69 AML cases and 43 ALL cases), which were received at the Department of Hematology of King Faisal Hospital (Kigali, Rwanda) and Rwanda Military Hospital between January 2019 and December 2023, were reviewed.

This was a cross-sectional and retrospective study where the recorded data of patients who were tested from 2019 to 2021 was checked by observing their result. Data collected was checked for completeness, entered, and analyzed using Microsoft excel and statistical package for social sciences (SPSS version 22).

**Inclusion Criteria:** All freshly diagnosed cases of Acute Myeloid Leukemia and acute lymphoblastic leukaemia from all age groups and both sexes were included in the study.

**Exclusion Criteria:** Patients already diagnosed as AML and ALL but with incomplete clinical records were excluded from this study.

**Ethical consideration:** The permission to conduct the research was granted by both King Faisal Hospital IRB and *Butaro Level II Teaching Hospitals* Research and Ethical Committee, The right to privacy and confidentiality were respected. Collected data were assigned anonymous codes and data generated were solely used only for the purpose of the study.

## **III. Results**

In a total of 112 patients of AML belonging to all age groups, 64 (57%) were males and 48(43%) were females with male to female ratio of 1.3:1. Age ranged from 2 years to 90 years with a mean age of 36.2 years. Among them 24 (21%) were below the age of 16 years and 88 (79 %) were more than 16 years with adult to children ratio of 3.7:1.

AML cases are 69 (61.6%) and ALL cases are 43(38.4%). Among 24 patients aged below 16 years old 15(62.5%) had acute myeloid leukaemia and 9(37%) had acute lymphoblastic leukaemia; while among 88 adults patients with leukaemia 60(68.2%) had acute myeloid leukaemia and 28(31.8%) had acute lymphoblastic leukaemia. Adults represent 86.9% (60/69) and children represent only 13.1% (9/69) of all AML cases.

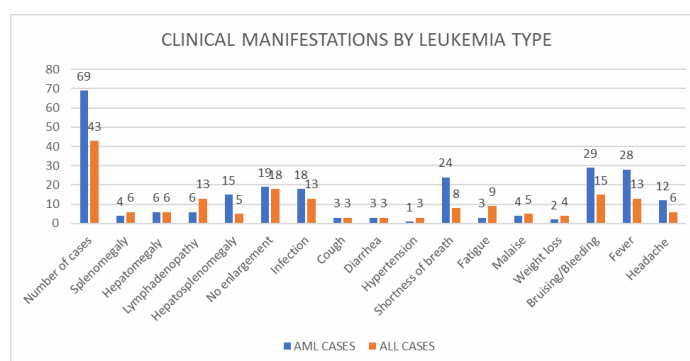
**Table 1: Clinical manifestations:**

CLINICAL MANIFESTATIONS	AML CASES	ALL CASES	TOTAL	%
Number of cases	69	43	112	100%
Splenomegaly	4(5.8%)	6(13.9%)	10	9%
Hepatomegaly	6(8.7%)	6(13.9%)	12	11%
Lymphadenopathy	6(8.7%)	13(30.2%)	19	17%
Hepatosplenomegaly	15(21.7%)	5(11.6%)	20	18%
No enlargement	19(27.5%)	18(41.8%)	37	33%
Infection	18(26.0%)	13(30.2%)	31	28%
Cough	3(4.3%)	3(6.9%)	6	5%
Diarrhea	3(4.3%)	3(6.9%)	6	5%
Hypertension	1(1.4%)	3(6.9%)	4	4%
Shortness of breath	24(34.8%)	8(18.6%)	32	29%
Fatigue	3(4.3)	9(20.9%)	12	11%
Malaise	4 (5.8%)	5(11.6%)	9	8%
Weight loss	2(2.9%)	4(9.3%)	6	5%
Bruising/Bleeding	29(42.0%)	15(34.8%)	44	39%
Fever	28(40.5%)	13(30.2%)	41	37%
Headache	12(17.3%)	6(13.9%)	18	16%

Table 1 shows the proportion of clinical manifestations in patients with acute leukaemia in Rwanda

The most common presenting clinical manifestations in patients with acute leukaemia in general were Bruising/Bleeding, fever, Shortness of breath, infection, hepatosplenomegaly and lymphadenopathy seen in 39%, 37% , 29%, 28%, 18%, and 17% respectively (Table 1). Other symptoms which were observed less frequently were weight loss, malaise, fatigue, hypertension, cough and diarrhea. The majority of patients with acute leukaemias manifested organomegaly (Hepatomegaly, splenomegaly, hepatosplenomegaly and lymphadenopathy).

The most common clinical manifestations in acute myeloid leukaemias were Bruising/Bleeding, fever, Shortness of breath , infections and Hepatosplenomegaly seen in 42.0%, 40.5%, 34.8%, 26.0% and 21.7%. While in patients with acute lymphoblastic leukaemia the most common clinical manifestations were Bruising/Bleeding(34.8%), and 30.2% with lymphadenopathy, infections and fever.



**Figure 1 shows the clinical manifestations in acute leukaemias in Rwanda in general**

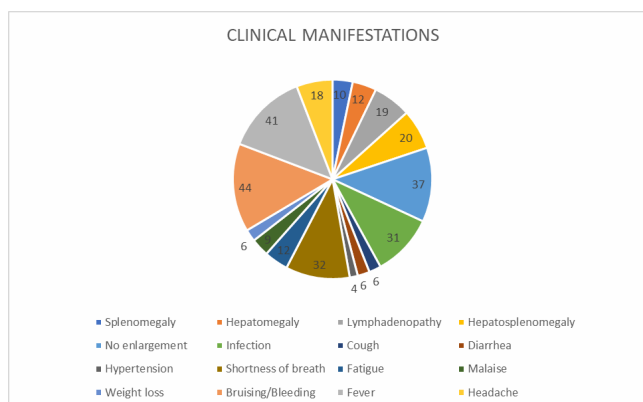


Figure 2 shows the proportion of clinical manifestations of acute leukemias per type of leukemia.

#### IV. Discussion

Acute leukaemias represents 2.9% of all cancers (excluding simple basal cell and squamous cell skin cancers) in the United States, and 30.4% of all blood cancers {10}. The most common type of leukemia in adults is AML, which makes up around 25% of all adult cases in the western world {11} and Among children with some form of cancer, about a third have a type of leukemia, most commonly acute lymphoblastic leukemia {12}.

In a total of 112 patients of acute leukaemia belonging to all age groups, 64 (57%) were males and 48(43%) were females with male to female ratio of 1.3:1. Age ranged from 2 years to 90 years with a mean age of 36.2 years. Among them 24 (21%) were below the age of 16 years and 88 (79 %) were more than 16 years with adult to children ratio of 3.7:1.

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AML is primarily a disease of adults. Overall incidence of AML increases with age. Patients newly diagnosed with AML have a median age of 65 years {13}. In our study the median age was 60 years mean age was 36.2 years in patients with AML. These results are similar to those from a study conducted in Adult patients with newly diagnosed AML at 63 centers in Japan and Australia in which the median age was 65 years {14}.

Disrupted hematopoiesis in acute leukaemias leads to the most common presenting manifestations, such as shortness of breath, infection, and bleeding tendency. Among study participants, majority presented with bruising/bleeding, infections, fever and shortness of breath. Other features included hepatosplenomegaly and lymphadenopathy, hepatomegaly, splenomegaly and weight loss. Similar findings have been reported in different studies {15, 16, 17}.

It is essential also to note that in this study hepatosplenomegaly was most common in patients with acute myeloid leukaemia while lymphadenopathy was prevalent in patients with acute lymphoblastic leukaemia. Findings from this study highlights the necessity of considering such information as the diagnosis of acute leukemias is often suspected because of clinical symptoms in combinations with other biological parameters.

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