

Diagnosis, Classification and Cytopenic Complications of Acute Leukemias Seen in JRA University Hospital Hematology Laboratory

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Abstract

Introduction: Acute leukemias (AL) are a group of hematologic disorders characterized by malignant clonal bone marrow precursors proliferation blocked on stage of differentiation known as "blasts". Our aims were to describe diagnosis, classification and cytopenic complications of AL.

Methods: We performed a descriptive retrospective study of patients who performed a myelogram at Hematology Laboratory of Joseph Ravoahangy Andrianavalona (JRA) Antananarivo University Hospital. Diagnosis of AL was made when percentage of blood or bone marrow blasts greater than 20%. For classification, we used cytological and cytochemical criteria of the FAB group.

Results: 714 myelograms were performed; hematological malignancies had 16.8% of cases (120/714). Of the 120 cases of hematological malignancies, 72.5% (86/120) were AL. Patients with leukemia were 2 ½ months and 79 years old with an average of 28 years. Children under 15 years old were most affected (45.3%; 38/86)

According to FAB classification, acute myeloid leukemia type 1 (AML1) accounted for 31.6% (18/578) of cases. ALL2 was represented at 84.6% (22/26) of ALLs. Regarding abnormalities of hemogram, thrombocytopenia, anemia and leukopenia were found respectively in 94.2%, 86% and 20.9% of cases.

Conclusion: ALs are rare pathologies. They affect all ages with a higher frequency in children under 15 years old. Myeloid types are more common. Cytopenias and clinical syndromes should not be neglected as they can be life-threatening.

Keywords - Acute Leukemia, Hemogram, Myelogram, FAB, Cytopenia.

I. INTRODUCTION

Acute leukemias (AL) are a group of hematologic disorders characterized by malignant clonal bone marrow precursors proliferation blocked on stage of differentiation known as "blasts". Depending on the lineage concerned, there are acute myeloid leukemia (AML) and acute lymphoblastic leukemia (ALL). Global incidence is

6/100000 inhabitants per year (1). Few data on cancer of hematopoietic organs are available in Madagascar and they represent 13.04% of cancers (2). In most low-income countries, diagnosis of AL is based on a bundle of clinico-biological arguments. Our aims were to describe the diagnosis, classification and cytopenic complications of AL.

II. METHODS

We performed a descriptive retrospective study of patients who performed a myelogram at Hematology Laboratory of Joseph Ravoahangy Andrianavalona (JRA) Antananarivo University Hospital. Each patient had a blood count realized on automaton, blood smear stained May Grunwald Giemsa, myelogram performed on sternal or iliac medullary specimen. Diagnosis of AL was made when percentage of blood or bone marrow blasts greater than 20%. For classification, we used t cytological and cytochemical criteria of the FAB (French American British) group.

III. RESULTS

During this period, 714 myelograms were performed, hematological malignancies accounted for 16.8% of cases (120/714). Of the 120 cases of hematological malignancies, 72.5% (86/120) were AL, 18.3% (22/120) were chronic myeloproliferative syndromes, 6.7% (8/120) were multiple

myeloma. Chronic lymphoid leukemia accounted for 2.5% of cases (3/120). Patients with acute leukemia were aged between 2½ and 79 years with an average of 28 years. Children under 15 years old were the most affected (45.3%; 38/86) **Figure 1**. We observed a clear male predominance with a ratio of 1.9.

Regarding cytological classification: 66.3% (57/86) were myeloid type, 30.3% (26/86) was lymphoid type and 3.4% (3/86) were biphenotypic **Figure 2. Figure 3 and 4** represent age distribution and cytological type.

According to FAB classification, acute myeloid leukemia (AML1) type 1 accounted for 31.6% (18/578) of the cases. **Figure 5**. ALL2 accounted for 84.6% (22/26) ALL. **Figure 6**.

Regarding abnormalities of hemogram, thrombocytopenia, anemia and leukopenia were found respectively in 94.2%, 86% and 20.9% of cases. **Figures 7** shows the distribution of complications of cytopenia.

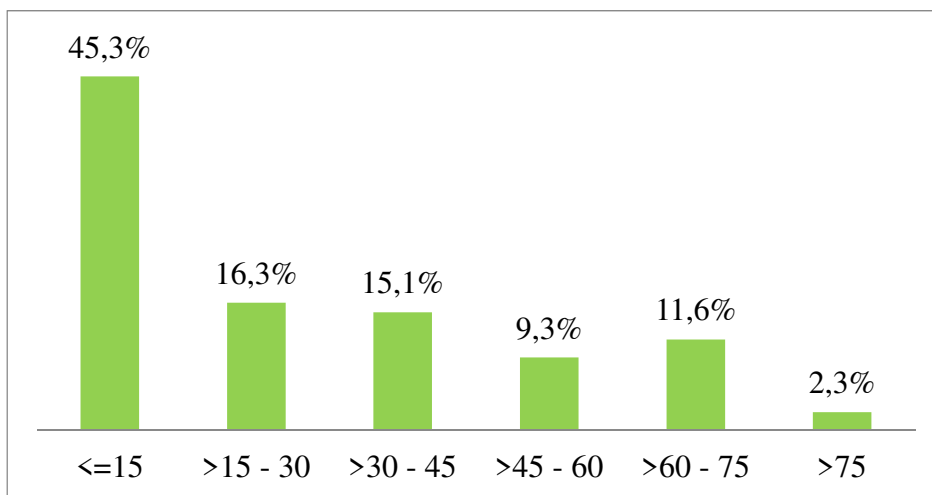


Figure 1 : Age distribution

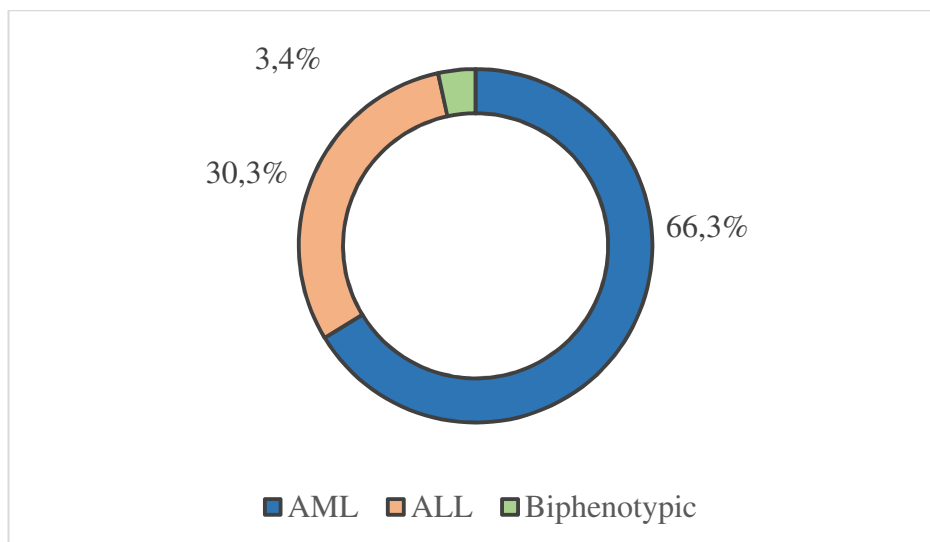


Figure 2 : AL classification

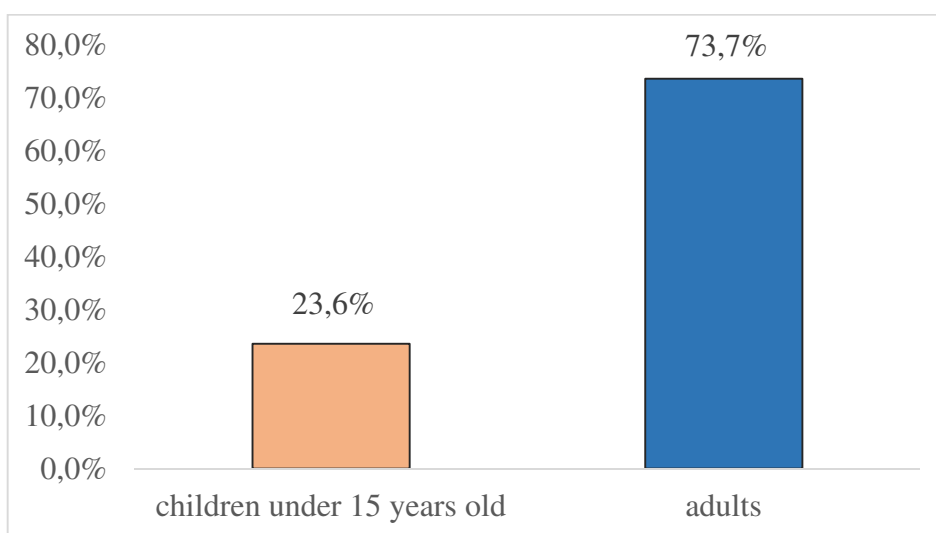


Figure 3: Age distribution of AML

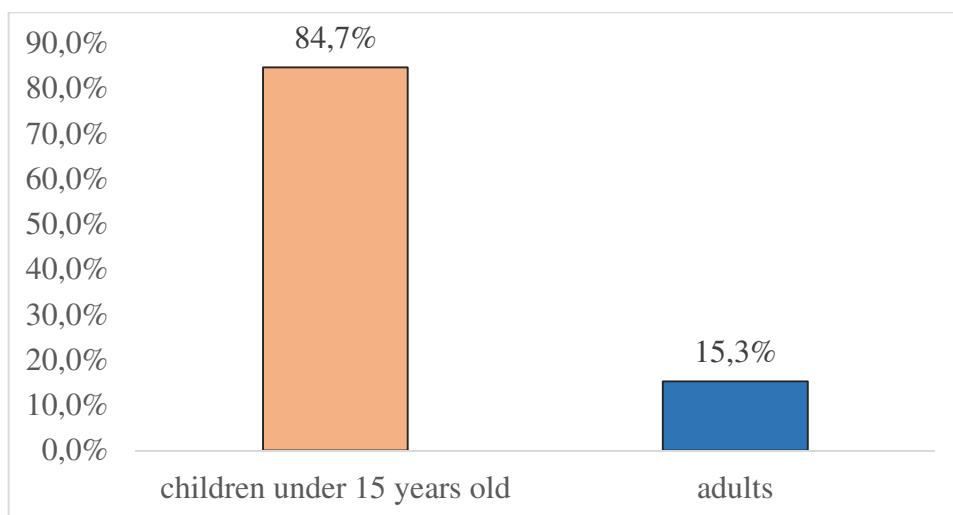


Figure 4: Age distribution of ALL

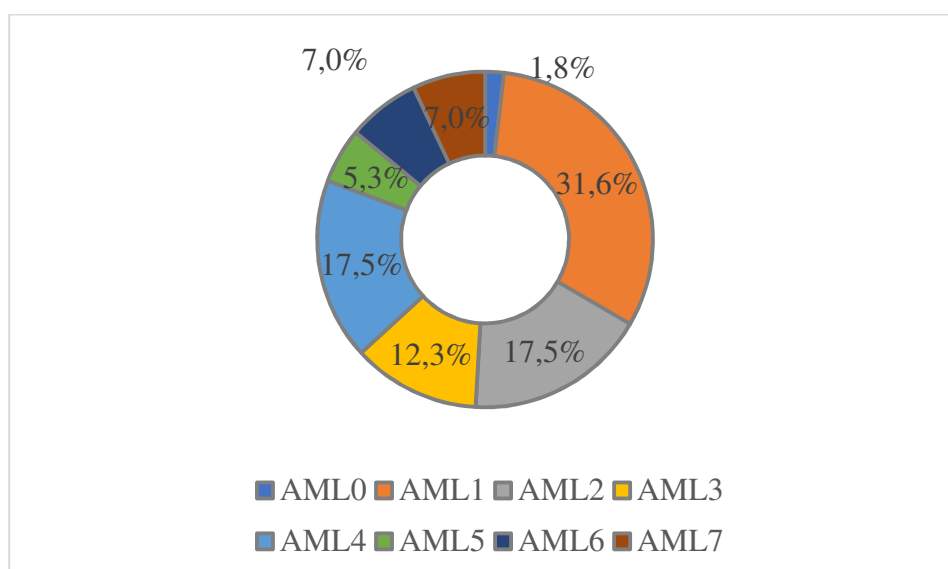


Figure 5: FAB classification of AML

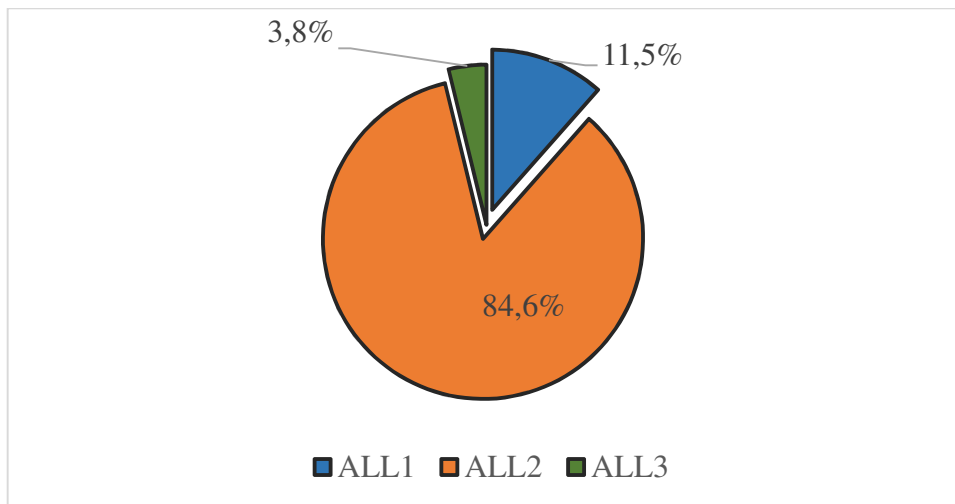


Figure 6: FAB classification of ALL

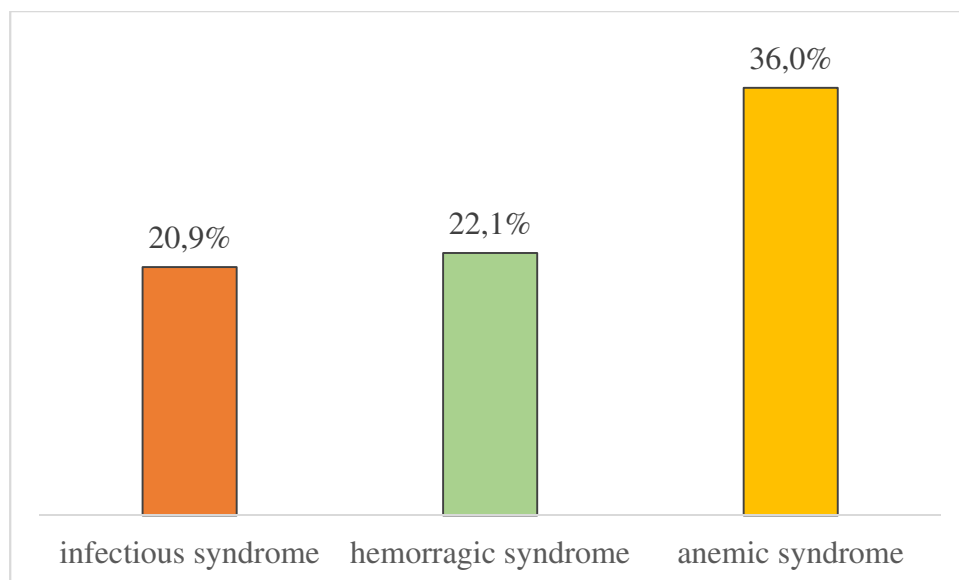


Figure 7: Cytopenic Complications of ALs

IV. DISCUSSION

In our series, 45.8% of AL cases were in children under 15 years old, with lymphoid predominance (84.7%). In addition, the child's AL is quite rare but is the leading cause of pediatric cancer. A Congolese study found 44.78% AL of child. In Western countries such as United States or Europe, lymphoid type represents 75 to 80% of children's AL, a Tunisian study reports a frequency of 72% of ALL in children (3) (4) (5). According to FAB classification criteria, we found a higher frequency of the ALL2 type. It

should be noted that this cytological classification of ALL is no longer of interest, both diagnostically and therapeutically and prognosis. This classification has been superseded by immunophenotypic classification of EGIL (European Group for the Immunological Characterization of Leukemias) and Cytogenetics (6).

AML affected 73.7% of subjects over the age of 15 with a median of 36.24 years. A median age of 70 years is reported in the literature (7). It should be noted that Malagasy population is a young. Regarding cytological

type, according to FAB group criteria, AML1 is the most frequent type followed by AML2.

In our series, proportion of onset of anemia agrees with the literature data and it would be a factor of poor prognosis. Occurrence of anemic syndrome is less important in our series than reported in literature (8).

V. CONCLUSION

ALs are rare pathologies. They affect all ages with a higher frequency in children under 15 years old. Myeloid types are more common. Cytopenias and associated clinical syndromes should not be overlooked as they may be life-threatening. Blood count, blood and bone marrow smear are essential in AL.

REFERENCES

- [1] Maynadie M, Troussard X. Epidemiology of acute leukemias. / data / reviews / 1773035X / v2015i471 / S1773035X1530071X / [Internet]. August 4, 2015 [cited Oct 22, 2019]; Available at: <https://www.em-consult.com/en/article/968285>
- [2] Rakotomanga NM, Hasiniatsy NR, Rajaonarison PJ, et al. Eight months of oncology practice at the Soavinandriana Hospital Medical Rev Madag 32 288-93, 3 (2): 288-93.
- [3] Baruchel A. Impact of biology in the characterization, understanding and treatment of acute lymphoblastic leukemia in children. Arch Pediatrics. May 1, 2003; 10: s102-5.
- [4] Roy P, Coleman MP. [Epidemiology of acute lymphoid leukemia]. Rev Epidemiol Public Health. 1992; 40 (5): 323-34.
- [5] Jmili NB, Aziz ABA, Nagara M, Mahjoub T, Ghannem H, Mondher K. Epidemiological and cytological profile of acute leukemias: About 193 cases collected at the Tunisian center. Rev Fr Lab. Jan 1, 2005; 2005 (369): 23-8.
- [6] Ratei R, Schabath R, Karawajew L, Zimmermann M, Möricke A, Schrappe M, et al. Lineage classification of childhood acute lymphoblastic leukemia according to the EGIL recommendations: results of the ALL-BFM 2000 trial. Klin Padiatr. May 2013; 225 Suppl 1: S34-39.
- [7] Cell Hematology Laboratory of Angers University Hospital [Internet]. [cited 22 Oct 2019]. Available on: <http://www.hematocell.fr/index.php/clear-lematology-history/62-cell-lematology-history-the-primary-hematological-diseases/pathology-lymphoid/108-leucemias-aigues-lymphoblastic>
- [8] Ekouya Bowassa G, Okouango Ova D-D, Ngolet L, Okoko A-R, Elira-Dokekias A. Acute leukemia of the child in Brazzaville. Arch Pediatrics. 2012; 19 (10): 1123-4.