



## Acute Leukemias with Unfavorable Prognosis

Georgescu GD<sup>1,2,\*</sup>, Ciortan S<sup>1</sup>, Raitaru A<sup>1</sup> and Gelatu I<sup>1</sup>

<sup>1</sup>Colentina Clinical Hospital, Bucharest, Romania

<sup>2</sup>Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

\*Corresponding author: Daniela GG, Colentina Clinical Hospital, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania; E-mail: [dana1601@yahoo.com](mailto:dana1601@yahoo.com)

### Abstract

Acute leukemia is a clonal, malignant disease characterized by the accumulation of abnormal blast cells, mainly in the bone marrow, and inhibition of normal hematopoiesis. Acute leukemia is a pathology that requires emergency diagnosis and can be associated with a poor prognosis. Objectives and Methods: There will be presented 6 cases of acute leukemia with associated pathology, with unfavorable prognosis. Results: There were 5 female with acute myeloid leukemia and 1 male patient with acute with acute lymphoblastic B cell leukemia hospitalized in the Colentina Clinical Hospital during years 2021-2022 with very poor outcome. The data were collected from the general clinical observation papers, with the consent of the patients. Conclusion: Acute leukemia is a high-risk malignancy that can be associated with other conditions which influence the patient's outcome.

**Keywords:** Acute leukemia is a clonal; Abnormal blast cells; Bone marrow

### Introduction

Acute leukemia is a clonal, malignant disease characterized by the accumulation of abnormal blast cells, mainly in the bone marrow, and inhibition of normal hematopoiesis [1]. Acute leukemia is a pathology that requires emergency diagnosis and can be associated with a poor prognosis.

### Objectives and Methods

There will be presented 6 cases of acute leukemia with associated pathology, with unfavorable prognosis. The data were collected from the general clinical observation papers, with the consent of the patients.

### Results

#### Case 1

The 38-year-old female with no medical history came to Emergency Room in December 2021 for headache and right hemiparesis.

Investigations show:

- CBC: WBC-148150/mm<sup>3</sup>, Mo- 127560/mm<sup>3</sup>, Hb- 7g/dL, Platelets- 25000/mm<sup>3</sup>

- Fibrinogen -122 mg/dL, D-dimeri >20(VN-0-0.5 mcg/ml)
- PBS: Atypical promyelocytes: 93%
- Bone marrow aspirate: hypercellularity with 90% atypical promyelocytes
- Immunophenotype: Acute Promyelocytic Leukemia (APL)
- FISH: t(15;17) in 94% from the analyzed nuclei
- PML RARA- positive
- Cardiac ultrasound: left ventricular ejection fraction - 60%
- CT cerebral: left frontal hemorrhagic stroke of ~28mm with cytotoxic edema, without mass effect on the midline and without intraventricular break-in

Diagnosis was with acute promyelocytic leukemia (APL) high risk, for which chemotherapy was initiated - treatment: ATRA+Idarubicine and Dexamethasone prophylaxis for ATRA syndrome [2,3]. On Day 3 of treatment: the patient presents temporo-spatial disorientation, desaturation and right upper limb hemiparesis. She installs a coma (GCS 5 points) and requires admission to the ICU. Cerebral CT scan show significant extension of the left frontal hemorrhage, with significant displacement of the median line to the right, as well as the new cerebellar.

On Day 5 of treatment Emergency decompression neurosurgery was performed, which revealed a ruptured arterio-venous

**Received date:** 10 November 2022; **Accepted date:** 22 November 2022; **Published date:** 27 November 2022

**Citation:** Georgescu GD, Ciortan S, Raitaru A, Gelatu I (2022). Acute Leukemias with Unfavorable Prognosis. SunText Rev Pediatr Care 3(2): 136.

**DOI:** <https://doi.org/10.51737/2766-5216.2022.036>

**Copyright:** © 2022 Georgescu GD, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

malformation, which led to death. Diagnosis was: bleeding arterio-venous malformation and multiple cortico-subcortical arterio-venous malformations.

## Case 2

A 38-year-old female, with grade III obesity and left upper limb venous thrombosis in March 2022 came to Emergency Room.

Investigations show:

- CBC: WBC-174080/mmc, Mo-142300/mmc, Hb-7 g/dl, Platelets-18000/mmc
- LDH - 1140U/L, CRP- 99 mg/L
- D-Dimeri 9.95 mcg/mL, Fibrinogen - 426 mg/dL
- PBS: 90% blasts
- Bone marrow aspirate: >90% blasts (suggestive of myeloblasts and monocytoid blasts)
- Immunophenotype: Acute myelomonocytic leukemia with co-expression of B lymphocyte markers [4]
- Cytogenetic: normal karyotype
- FLT3 TKD positive [5]
- Cardiac ultrasound: left ventricular ejection fraction – 60%
- Venous doppler ultrasound of the left upper limb: Superficial venous thrombosis left cephalic vein
- CT scan: Segmental and subsegmental pulmonary thromboembolism. Splenic infarction

Diagnosis was acute myelomonocytic leukemia FLT3 TKD positive - hyperleukocytic form (High risk AML M4 FAB) for which standard induction protocol, 3+7, and FLT3 inhibitor (Midostaurin) was initiated [6].

Since the patient associated left cephalic vein thrombosis, complicated with PE in the segmental and subsegmental arteries, splenic infarction, bilateral central retinal vein thrombosis - hemorrhagic form and subsequent cerebellar hemorrhagic stroke, the outcome was poor. CT scan show Cerebellar hemorrhagic stroke, with cytotoxic edema, causing a mass effect on the IV ventricle, which led to death.

## Case 3

A 44-year-old patient, chronic ethanol user and smoker, came to Emergency Room in June 2022 for cutaneous petesial purpura.

Investigations show:

- CBC: WBC -400/mmc, Neu-100/mmc, Hb-4,9 g/dl , Platelets-1000/mmc
- CRP - 246mg/L, ALT - 224 U/L, AST - 22 UI/L, PCT-0.36 ng/mL, uric acid – 18.36 mg/dl
- Ac anti EBV and CMV IgM – negative
- Fibrinogen - 568 mg/dl, D-Dimeri-1.67 mg/ml
- PBS: 3% blasts

- Bone marrow aspirate: 90% blasts with a round nucleus, finely structured, with basophilic cytoplasm, without granulations
- Immunophenotype: B cell Acute lymphoblastic leukemia [7]
- Cardiac ultrasound: left ventricular ejection fraction – 60%

Diagnosis was acute lymphoblastic B cell leukemia, with severe pancytopenia for whom specific chemotherapeutic treatment was initiated: start protocol GRALL 2003. [8]. During post-chemotherapy aplasia presented sepsis with positive blood cultures for E. coli and Candida Tropicalis, with unfortunate evolution, despite the broad-spectrum antibiotic and antifungal treatment. He installs a coma (GCS 5 points) and requires admission to the ICU, Oro-tracheal intubation and mechanical ventilation and exitus.

## Case 4

A 66-year-old female, with no significant medical history, diagnosed in February 2020 with acute myelomonocytic leukemia secondary after CMMoL [9].

Investigations show:

- CBC: WBC - 47170/mmc, Mo-25000/mmc, Hb-10 g/dl, Platelets-15000/mmc
- LDH-390 U/L
- PBS: 18 % blasts, myelocytes 14%, metamyelocytes -10%, Mo-10%
- Bone marrow aspirate: 10% myeloblasts, 13% atypical monocytes, erythroblastopenia
- Immunophenotype: 13 % myeloblasts and 26% monocytoid infiltrates
- Bone marrow biopsy: Transformed chronic myelomonocytic leukemia (CMMoL)
- Cytogenetic: trisomy 10 and 11
- FLT3 negative
- Cardiac ultrasound: left ventricular ejection fraction – 50%

Diagnosis was AML M 5 FAB post CMMoL, for which therapy with hypomethylating agent was administered [10]. In July 2020, the bone marrow biopsy reveals diagnosis of AML M 5 FAB post CMMoL and a BCL2 inhibitor was added to Azacitidine therapy [11]. The patient had initial favorable response to treatment, but with complications: neutropenia and thrombocytopenia and in December 2021 - Bronchopneumonia. In January 2022, the patient associated SARCOV2 infection treated with Remdesivir treatment [12,13]. But severe neutropenia and thrombocytopenia with severe GI bleeding led to death.

## Case 5

A 64-year-old female, with obesity gr II and type 2 Diabetes, was initially diagnosed in 2011 with MDS-RAEB2, for whom she received treatment with a hypomethylating agent, with a partial

hematological response, with persistent thrombocytopenia [14,15].

In June 2022, the patient was hospitalized with extensive cutaneous mucosal hemorrhagic syndrome.

Investigations revealed:

- CBC: WBC 129710/mmc, Mo-74300/mmc, Hb-6.1g/dL, Platelets-11000/mmc
- PBS: Monoblasts – 50%
- Bone marrow aspirate– 70% blasts/ atypical monocytes
- Immunophenotype: Acute Monoblastic Leukemia
- FLT3 ITD + positive
- Cytogenetic: Del 11q

Diagnosis was transformation into acute leukemia - AML FAB M4 with hyperleukocytosis, high risk, with the presence of Del (11) (q23) and positive FLT3 ITD mutation [16]. During evolution, the patient installs cerebellar hemorrhagic stroke, which led to death.

## Case 6

A 54-year-old female, known with Spondylitis on immunosuppressive treatment, came to Emergency Room in December 2021 for pain right ankle and profuse perspiration.

Investigations revealed:

- CBC: WBC 2800/mmc, Hb-9.5g/dL, Platelets-250000/mmc
- CRP-209 mg/L, PCT- 0.39 ng/mL
- D-Dimeri 2.27 mcg/ml, Fibrinogen- 607 mg/dL
- PBS: blasts- 10%
- Bone marrow aspirate: >80% blasts with a round nucleus, rare nucleoli, a lot of cytoplasm, blue, without granulations
- Immunophenotype: AML secondary post MDS
- Bone marrow biopsy: AML M2 FAB
- Cytogenetic: complex karyotype: hipo diploidia, del 8q
- FLT3 ITD negative
- Cardiac ultrasound: left ventricular ejection fraction – 55%
- CT scan: Hepatomegaly; hepatic hemangioma

Diagnosis was acute myeloblastic leukemia - High risk AML M2 FAB, post myelodysplastic syndrome, for which standard induction protocol, 3+7” was initiated, followed by period of severe aplasia, during which she presents SEPSIS, Clostridium Difficile infection, SARS-COV2 infection, positive blood cultures with E. Coli for which she received broad-spectrum antibiotic treatment and antiviral treatment. Due to severe thrombocytopenia, the patient has severe GI bleeding. During the hospitalization the patient also presented an internal jugular vein thrombosis associated with the insertion of the central venous catheter. The patient's evolution was unfavourable. She installs a coma (GCS 5 points) and requires admission to the ICU, Oro-tracheal intubation and mechanical ventilation and exitus [17].

## Conclusion

Acute leukemia is a high-risk malignancy that can be associated with other conditions which influence the patient's outcome, despite current therapeutic advances.

## References

1. Hematology W, 10th Edition. Kenneth Kaushansky, Marshall Lichtman, Josef Prchal, Marcel Levi, Linda Burns, David C. Linch.
2. Cingam SR, Koshy NV. Acute Promyelocytic Leukemia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022.
3. Shah G, Mikhail FM, Bachiasvili K, Vachhani P, Erba HP, Papadantonakis N, et al. Outcomes of high-risk acute promyelocytic leukemia patients treated with arsenic trioxide (ATO)/all trans retinoic acid (ATRA) based induction and consolidation without maintenance phase: A case Series Hematology/Oncology and Stem Cell Therapy. 2020; 13: 143-146.
4. Acute Myelomonocytic Leukemia (AML, NOS) In Diagnostic Pathology: Blood and Bone Marrow (Second Edition), 2018.
5. Kennedy VE, Smith CC. FLT3 Mutations in Acute Myeloid Leukemia: Key Concepts and Emerging Controversies. Front Oncol. 2020; 10: 612880.
6. Daver N, Venugopal S, Ravandi F. FLT3 mutated acute myeloid leukemia: 2021 treatment algorithm. Blood Cancer J. 2021; 11: 104.
7. Terwilliger T, Abdul-Hay M. Acute lymphoblastic leukemia: a comprehensive review and 2017 update. Blood Cancer J. 2017; 7: e577.
8. Hulegårdh E, Nilsson C, Lazarevic V, Garelius H, Antunovic P, Derolf AR, et al. Characterization and prognostic features of secondary acute myeloid leukemia in a population-based setting: a report from the Swedish Acute Leukemia Registry. Am J Hematol. 2015; 90: 208-214.
9. Martínez-Cuadrón D, Megías-Vericat JE, Serrano J, Martínez-Sánchez P, Rodríguez-Arbolí E, Gil C, et al. Treatment patterns and outcomes of 2310 patients with secondary acute myeloid leukemia: a PETHEMA registry study. Blood Adv. 2022; 6: 1278-1295.
10. Cherry EM, Abbott D, Amaya M, McMahon C, Schwartz M, Rosser J, et al. Venetoclax and azacitidine compared with induction chemotherapy for newly diagnosed patients with acute myeloid leukemia. Blood Adv. 2021; 5: 5565-5573.
11. Papamichalis P, Tsinti G, Papapostolou E, Hadjichristodoulou C, Speletas M. Newly Diagnosed Acute Myeloid Leukemia in a Patient With Severe SARS-CoV-2 Infection. Cureus. 2021; 13: e14480.
12. Ko WC, Rolain JM, Lee NY, Chen PL, Huang CT, Lee PI, et al. Arguments in favour of remdesivir for treating SARS-CoV-2 infections. Int J Antimicrob Agents. 2020; 55: 105933.
13. Atallah E, Bylow K, Troy J, Saber W. Treatment of older patients with high-risk myelodysplastic syndromes (MDS): the emerging role of allogeneic hematopoietic stem cell transplantation (Allo HSCT). Curr Hematol Malig Rep. 2014; 9: 57-65.



SUNTEXT REVIEWS

14. Itzykson R, Thepot S, Quesnel B, Dreyfus F, Recher C, Wattel E, et al. Long-term outcome of higher-risk MDS patients treated with azacitidine: an update of the GFM compassionate program cohort. *Blood*. 2012; 119: 6172–3.
15. Tabak D, Fernandez TDS, Ornellas MH, Carvalho LOD. Chromosomal alterations associated with evolution from myelodysplastic syndrome to acute myeloid leukemia, *Leukemia Res*. 2000.
16. Malik IA, Turanzas MC, Gaeta S, Borthakur G, Price K, Cortes J, et al. Sepsis and Acute Myeloid Leukemia: A Population-Level Study of Comparative Outcomes of Patients Discharged From Texas Hospitals, *Clinical Lymphoma Myeloma & Leukemia*. 2017; 17: e27-e32.