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AML-557: Clinical Outcomes of Therapy-Related Acute Leukemia (t-AL): A Single-Center Retrospective Analysis

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INTRODUCTION

- Therapy-related acute leukemia (t-AL) arises after cytotoxic chemotherapy and/or radiation therapy and is associated with a poor prognosis.
- Unlike therapy-related acute promyelocytic leukemia (t-APL) and therapy-related core-binding factor acute myeloid leukemia (t-CBF-AML), which tend to have favorable cytogenetics, t-AL tends to have adverse cytogenetics.

AIMS

- To identify the incidence of t-AL among AL patients treated at our institution.
- To characterize the different subtypes of t-AL.
- To analyze the clinical outcomes of patients with t-AL treated at our institution.

METHOD

- Design: Single-center retrospective study evaluating the clinical outcomes of patients with t-AL from 01/2013 to 12/2020.
- Setting: General community, academic hospital.
- Study participants: Adults with t-AL.
- Methodology: Baseline clinical characteristics, demographics, laboratory data, imaging, pathology reports, treatment regimens, and clinical outcomes were retrieved and analyzed.
- Data are expressed as counts, percentages, and medians.
- AML risk was classified based on ELN 2022 risk stratification.

RESULTS

- 120 patients with AL were analyzed:
  - ✓ 10 had t-AL: 9 had t-AML and 1 had t-ALL.
  - ✓ Of the 9 patients with t-AML, 4 had t- APL, 1 had t-CBF-AML, and 4 had adverse-risk t-AML per ELN 2022 risk stratification.
- Of the 4 with t-APL;
  - ✓ All received ATRA-ATO; 2 received additional idarubicin.
  - ✓ 1 patient died from intracerebral hemorrhage, and 3 are alive.
- Of the 4 patients with adverse-risk t-AML:
  - ✓ 3 received decitabine-venetoclax, and all 3 died from acute hypoxic respiratory failure during induction.
  - ✓ 1 received 3 days of fludarabine, idarubicin, and cytarabine (FIA) and died of multiorgan failure.

	n=10
Age, years (median)	**58.5**
Sex	
Male, n (%)	**2 (20)**
Female, n (%)	**8 (80)**
Race	
White, n (%)	**5 (50)**
Black, n (%)	**2 (20)**
Hispanic, n (%)	**2 (20)**
Other, n (%)	**1 (10)**
Leukemia type	
t-AML, n (%)	**9 (90)**
t-ALL, n (%)	**1 (10)**
AML risk stratification	
t-APL, n (%)	**4 (44.4)**
t-CBF-AML, n (%)	**1 (11.1)**
Adverse risk, n (%)	**4 (44.4)**
Outcome	
Alive, n (%)	**5 (50)**
Deceased, n (%)	**5 (50)**

- The patient with favorable-risk t-CBF-AML (inversion 16):
  - ✓ Received FIA for 3 days and gentuzumab ozogamicin (GO), followed by consolidation therapy.
  - ✓ Achieved a CR with negative MRD by molecular testing.
  - ✓ Is alive at 14-months of follow-up.
- The patient with t-ALL (BCR-ABL positive):
  - ✓ Received rituximab and cyclophosphamide alternating with methotrexate and dexamethasone for 4 cycles followed by 4 cycles of blinatumomab.
  - ✓ Received dasatinib starting on day 1 of induction therapy.
  - ✓ Achieved CR and MRD negativity by flow and is currently undergoing maintenance therapy with POMP and blinatumomab.

CONCLUSIONS

- t-AL tends to have adverse cytogenetics.
- 10% of the AML population treated in our hospital had t-AL.
- Half of the patients are still alive, and half had died by the time of analysis.
- t-AL with favorable cytogenetics is a rare occurrence. Interestingly, in our population of t-AL, 50% of patients had favorable-risk t-AL: 4 with t-APL and 1 with t-CBF-AML.

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