Early Deaths in Patients with Newly Diagnosed Acute Promyelocytic Leukemia: A Single-Center Retrospective Study from a General Hospital

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Background

- Acute promyelocytic leukemia (APL) is a distinct subtype of acute myeloid leukemia (AML) characterized by t (15;17) translocation.
- In the era of all-*trans* retinoic acid (ATRA) and arsenic trioxide (ATO), APL has become the most curable subtype of adult AML.
- Despite the significant improvement in outcomes, early deaths (EDs, death within 30 days) due to coagulopathy and bleeding diathesis remain a significant challenge.
- Large multicenter trials have reported an ED rate of 5%–10% in APL, mainly due to intracranial hemorrhage (ICH). However, ED rates can be as high as 30% in a general hospital.

Materials and Methods

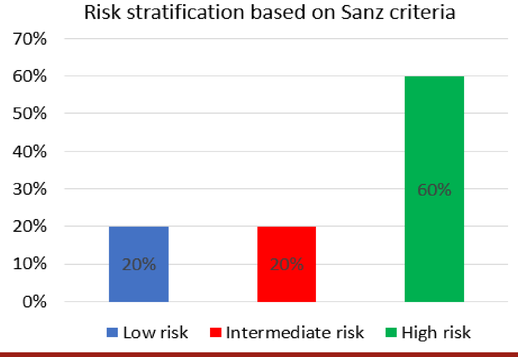
- We retrospectively analyzed adult patients (≥18 years old) with newly diagnosed APL treated at MHH between January 2009 and December 2021.
- The consecutive list of patients with APL was prepared using the pharmacy electronic medical records of MHH Cancer Center.
- We collected baseline demographic variables, complete blood count, coagulation parameters, bone marrow and peripheral blood molecular analysis, immunohistochemistry, cytogenetics, Sanz score and risk stratification, timing of initiation of ATRA, complete response rate, major adverse events during induction, and ED rate.

Results

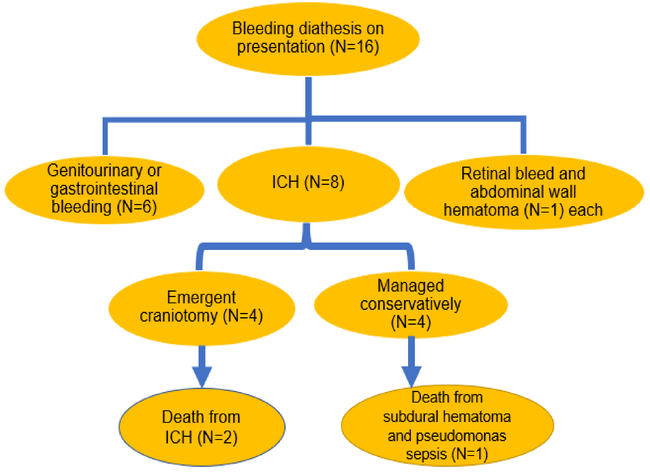
Table 1: Patient characteristics (N=25)

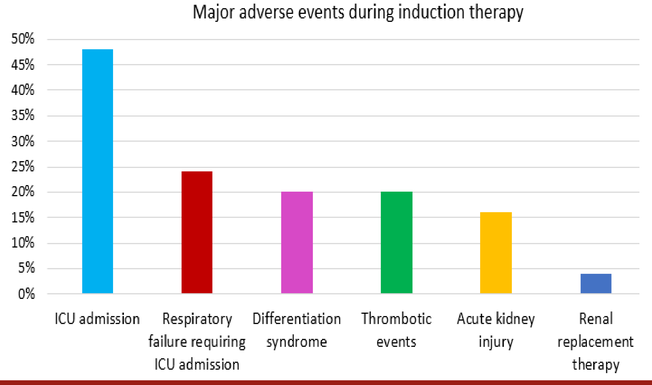
	Median	Range	N (%)
Age, years	40	20–67	
Sex			
-Men			13 (52%)
-Women			12 (48%)
Subject race			
-Whites			10 (40%)
-African Americans			4 (16%)
-Hispanics			7 (28%)
-Asians			4 (16%)
WBC count, 10^9/L	27	0.1–400	
Platelet count 10^9/L	35	7–143	
DIC and bleeding diathesis on admission			16 (64%)
Time to initiation of ATRA (hours)	12	4–96	
Induction regimen (ATRA+ATO)			25 (100%)
High-risk APL (Gemtuzumab ozogamicin/idarubicin)			15 (60%)

DIC- disseminated intravascular coagulation



Results





Discussion

- APL is a medical emergency that requires prompt initiation of ATRA, aggressive transfusion support to correct coagulopathy, and critical care expertise.
- All leukemic patients presenting with bleeding diathesis and a clinical suspicion of APL should be started on ATRA immediately without waiting for cytogenetic confirmation.
- Prompt management of differentiation syndrome and infectious complications are crucial to lower ED.
- Access to critical care and neurosurgery is pivotal in improving outcomes of APL patients presenting with ICH.

Conclusion

- EDs primarily due to ICH remain a major challenge and the main cause of treatment failure in APL.
- In our series of 25 patients, the ED rate was relatively low (12%) despite 8 of the patients (32%) presenting with ICH.
- Early diagnosis, timely administration of ATRA, correction of coagulopathy, critical care, and neurosurgery support are pivotal in reducing ED in APL.

References

1. Park JH, Qiao B, Panageas KS, et al. Early death rate in acute promyelocytic leukemia remains high despite all-trans retinoic acid. Blood. 2011;118(5):1248-1254.
2. Lehmann S, Ravn A, Carlsson L, et al. Continuing high early death rate in acute promyelocytic leukemia: a population-based report from the Swedish Adult Acute Leukemia Registry. Leukemia. 2011;25(7):1128–1134.