CLINICAL OUTCOMES OF INDUCTION CHEMOTHERAPY DURING MECHANICAL VENTILATION IN NEWLY DIAGNOSED ACUTE MYELOID LEUKEMIA

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INTRODUCTION & AIMS

Patients with newly diagnosed acute myeloid leukemia (AML) requiring mechanical ventilation (MV) during initial hospitalization experience extremely high early mortality.[1] The role and optimal timing of induction chemotherapy, including whether to continue or interrupt treatment during critical illness, remain uncertain.[2] We evaluated outcomes associated with induction chemotherapy administered during MV in newly diagnosed AML.

METHODS

- Retrospective, single-center cohort study
- Consecutive adults (2018–2025) with newly diagnosed AML requiring MV during index hospitalization, for whom induction chemotherapy was intended or had been initiated, were included. Patients who completed induction before MV were excluded.
- Primary outcome = 30-day mortality from MV initiation
- Secondary outcomes = ICU and hospital mortality, composite 60-day alive/ICU-free days, and overall survival (OS).

CONCLUSIONS

Among newly diagnosed AML patients requiring MV, **induction chemotherapy during critical illness was associated with improved survival and greater ICU-free recovery**. The association remained significant in time-varying analysis, while a 3-day landmark analysis showed a consistent direction of benefit. Given the retrospective design and potential for treatment-selection bias, these findings warrant prospective investigation.

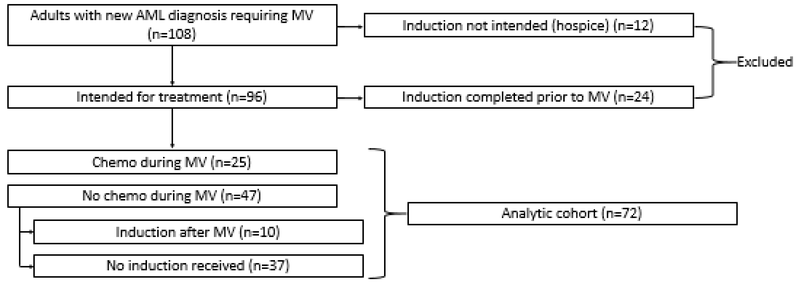
REFERENCES

[1]Desprez C, et al. Outcome of patients with newly diagnosed AML admitted to the ICU, including preemptive admission - a multi-center study. *Ann Hematol*. 2023;102(6):1383-1393. doi:10.1007/s00277-023-05205-6

[2]Benoit DD, et al. Outcome in severely ill patients with hematological malignancies who received intravenous chemotherapy in the intensive care unit. *Intensive Care Med*. 2006;32(1):93-99. doi:10.1007/s00134-005-2836-5

RESULTS

Figure 1. Study Cohort Selection and Treatment Trajectories



60-Day Alive/ICU-Free Days
Median: 29 vs 0 days
Chemotherapy during MV (n=25) vs no chemotherapy during MV (n=47)
p<0.001
64% vs 2% had > 0 alive/ICU-free days

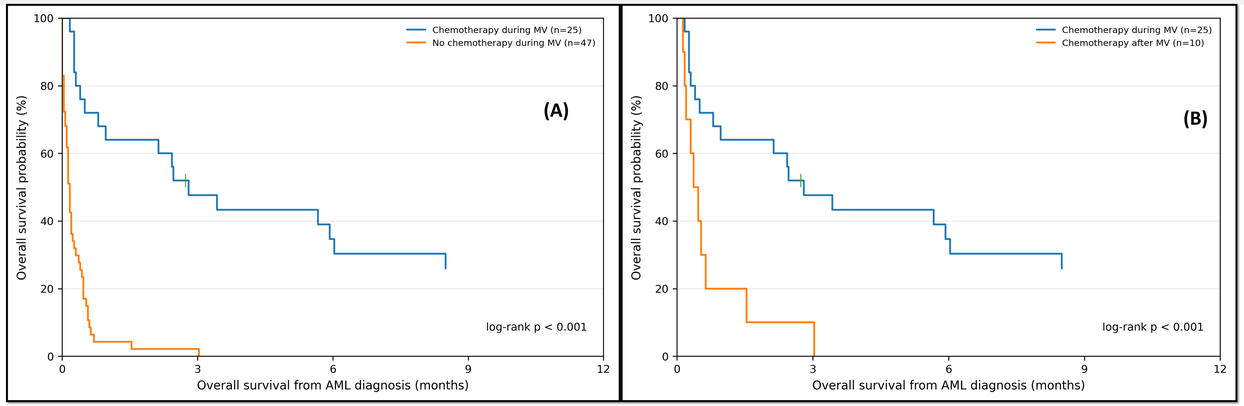


Figure 3. Kaplan-Meier analysis of overall survival among patients receiving induction chemotherapy during mechanical ventilation (n=25) versus **(A)** other analytic cohort patients (n=47) and **(B)** those receiving chemotherapy after mechanical ventilation (n=10).

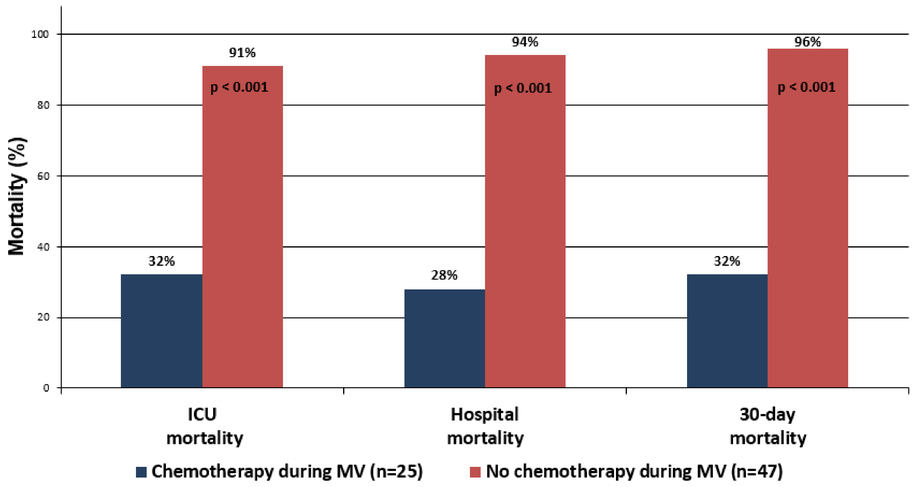
Table 1. Baseline Patient & Disease Characteristics of Analytic Cohort

Characteristic	Chemo during MV (n=25)	Other (n=47)	p-value
Age, median (range)	**58 (20-77)**	**65 (25-88)**	**0.026**
Male	12/25 (48%)	33/47 (70%)	0.078
ECOG, median (range)	1 (0-2)	1 (0-3)	0.593
Charlson, median (range)	4 (2-8)	5 (2-10)	0.314
ELN 2022 intermediate/adverse-risk	15/25 (60%)	35/47 (74%)	0.283
DIC	18/25 (72%)	39/47 (83%)	0.362
Clinical TLS	11/25 (44%)	25/47 (53%)	0.621
Culture-positive infection	**13/25 (52%)**	**8/47 (17%)**	**0.003**
Leukostasis	**10/25 (40%)**	**33/47 (70%)**	**0.022**
Vasopressor/inotrope use	24/25 (96%)	44/47 (94%)	1.000
CRRT	9/25 (36%)	15/47 (32%)	0.795
# ICU interventions, median (range)	2 (1-3)	2 (1-3)	0.895

Documented Reasons for Withholding Induction Chemotherapy

Clinical instability (81%), diagnostics (17%)

Figure 2. Early Mortality by Chemotherapy during MV



TIME-VARYING COX MODEL

Chemo during MV: **HR 0.29** (95% CI 0.14–0.63), *p=0.002*

Adjusted for age, leukostasis, vasopressor use, and renal replacement therapy

SENSITIVITY ANALYSIS

3-day landmark sensitivity analysis - 30-day mortality: 65% vs 31%, *p=0.054*

CONTACT INFORMATION

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