Venetoclax–Azacitidine Versus Intensive Chemotherapy for Induction in Childhood Acute Myeloid Leukemia: A Comparative Analysis

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Introduction

Pediatric AML outcomes in LMICs remain limited by treatment-related toxicity, infections, prolonged hospitalization, and constrained supportive-care resources.

Venetoclax plus azacitidine (VA) is established in adult AML but remains underexplored as frontline therapy in children.

A lower-intensity outpatient-capable induction strategy may be particularly valuable in resource-limited settings.

Aim

To compare the **safety, efficacy, healthcare resource utilization, and cost-effectiveness** of venetoclax–azacitidine (VA) versus conventional 3+7 induction in children with newly diagnosed AML.

Methods

Retrospective cohort: 320 children (≤15 years) with newly diagnosed AML treated from **2016–2025**; 3+7 (n=271) and VA (n=49).

Outcomes: CR/CRi, MRD, toxicity, resource utilization, OS, and QALDs.

Analysis: Propensity score matching (1:3; caliper 0.1) adjusted for age, sex, baseline TLC, and genomic risk. OS was estimated using Kaplan–Meier analysis.

Conclusion

- VA is a feasible low-intensity induction strategy for pediatric AML.
- VA is associated with less hospitalization, febrile neutropenia, sepsis and transfusion requirement.
- After propensity-score matching, remission and overall survival were comparable between VA and 3+7.
- VA resulted in higher QALD, although the ICER exceeded the Indian WTP threshold.
- Prospective studies should define optimal patient selection, schedule and post-remission therapy.

Results

Baseline Profile

Characteristic	3+7 n=271	VA n=49	p
Age ≥10 y	37%	51%	0.050
Male	70%	61%	0.132
TLC ≥50,000	32%	27%	0.292
Favorable risk	54%	23%	
Intermediate risk	41%	12%	<0.001*
Adverse risk	**5%**	**65%**	

*Overall molecular-risk distribution p<0.001; VA was markedly enriched for adverse-risk disease.

Key Outcomes | VA vs 3+7

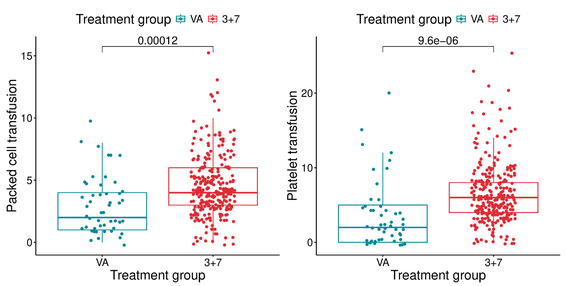
59% vs 100%
Hospitalized
p<0.001

78% vs 98%
Febrile neutropenia
p<0.001

4% vs 13%
Treatment-related mortality
p=0.06

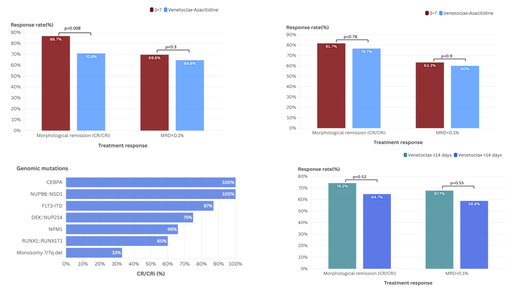
76.7% vs 81.7%
Matched CR/CRi
p=0.78

Transfusion Requirements



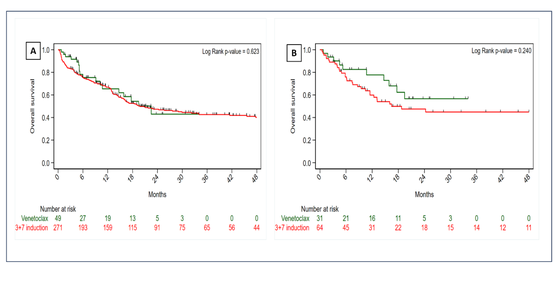
VA reduced transfusion requirements.

Treatment Response



CR/CRi and MRD negativity were comparable.

Overall Survival



Matched 2-y OS: VA 56.7% vs 3+7 47.5% (p=0.24).

Economic Analysis | QALDs 34.3 vs 16.8 • Mean cost ₹275,711 vs ₹171,135 • ICER ₹5,976 (USD 68.6)/QALD

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