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abstract

Implication of Post-Induction Minimal Residual Disease in the Management of Pediatric Acute Lymphoblastic Leukemia in Resource-Limited Setting

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abstract



Implication of Post-Induction Minimal Residual Disease in the Management of Pediatric Acute Lymphoblastic Leukemia in Resource-Limited Setting

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Introduction: Minimal residual disease (MRD) measurement in pediatric acute lymphoblastic leukemia (ALL) is the most powerful tool for treatment response assessment. This study aims to assess the implications of post-induction Day 29 MRD evaluation in the management of pediatric ALL within a resource-limited setting and its correlation with interim Day 8/15 bone marrow assessment.

Methodology: A prospective analytical study was conducted at the Pediatric Hematology Oncology Department over one year period of 2023. Flow Cytometry based newly diagnosed ALL patients aged 1-16 years were included. MRD assessment on day 29 of induction and interim bone marrow evaluations on day 8/15 were performed according to UKALL-2019 protocol. Clinical data was collected on proformas and analyzed by SPSS 20.

Results: Altogether 578 patients were enrolled with male predominance 407(70.4%).

Prevalent age group was 5-10 years constituting 56%. Flow Cytometry showed Pre-B 468 (81%) and Pre-T ALL 110(19%). Majority were high risk 379(65.6%) who received 4 drug induction while only 199 (34.4%) standard risk. Interim bone marrow response was mainly M2 in 502(86.9%) and M3 in 73(12.6%). Post-induction day-29 MRD was <0.01% in 495 (85.6%) patients who were continued on same initial treatment regimen and >0.01% in 83 (14.4%) who required further treatment escalation. Patients with M3 interim bone marrow response were mainly high risk 42 and had Day 29 MRD >0.01%. Induction mortality was 32% with 8% abandonment.

Conclusion: Our study has demonstrated significant induction remission response in ALL by achieving negative MRD which correlates strongly with interim bone marrow assessment, proposing day 29 MRD as a single best cost-effective tool for response evaluation in resource limited settings.