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Treatment Outcomes for Childhood Acute Lymphoblastic Leukemia in Resource-Limited Settings: A Hybrid Risk-Stratified Treatment Protocol Without Minimal Residual Disease Measurement

Authors: Suzan Alsakka1* , Safaa Jneidi1 , Khaled Ghanem1**
1 BASMA Pediatric Oncology Unit, Damascus, Syria * Presenting author ** Senior author and study principal investigator

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INTRODUCTION

Modern pediatric acute lymphoblastic leukemia (ALL) protocols in high-income countries have led to significant improvement in survival rates exceeding 80%.

Advanced techniques like measurement of minimal residual disease (MRD) may be lacking in low-income countries.

AIM

In this abstract, we describe our experience in treating children with ALL in Syria using a risk-stratified treatment protocol without MRD measurement.

METHOD

- Retrospective study of ALL children treated between June 2018 & June 2021.
- Risk stratification was based on initial WBC, extramedullary disease presence, phenotype, karyotype, FISH studies for Philadelphia chromosome and MLL rearrangement, peripheral smear assessment at day 8 of the prednisone prophase, and end of induction response assessment by bone marrow smear exam
- Patients with low-risk disease received treatment as per the EORTC 58951 AR1 protocol
- Intermediate-risk patients received treatment as per the EORTC 58951 AR2 protocol
- Patients with high-risk disease received treatment as per the St Jude TOTAL XV protocol
- Infants and children with Down syndrome were excluded.

RESULTS

The outcome of 104 consecutive patients during the study period was analyzed
The male-to-female ratio was 1.3
Median age at diagnosis of 5.4 years (range: 1 – 16 years).
Among the patients, 76 were stratified as having low-risk disease, while 21 and 7 patients were categorized as having intermediate- and high-risk disease, respectively
Three patients (2.1%) died due to treatment-related toxicity
The median follow-up duration was 42 months.
The 5-year overall survival and event free survival rates were 79.8% (95% CI: 62.4-89.7) and 70% (95% CI: 58.7-78.8), respectively.
Remarkably, the low-risk patients exhibited unexpectedly lower 5-year overall survival rates of 74.9% (95% CI 42.3-90.7) and event-free survival rates of 66.5% (95% CI: 51.9-77.6) compared to other risk groups.

CONCLUSIONS

Despite achieving excellent survival outcomes for children and adolescents with acute lymphoblastic leukemia treated using a hybrid adapted risk-stratified protocol in our resource-limited setting, the lack of MRD measurement has led to lower survival rates in low-risk patients compared to other risk groups. Implementation of optimal MRD measurement is needed to further improve outcomes.

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CONTACT INFORMATION

dr.alsakka9@gmail.com

drkhghanem@gmail.com