ALL-311

Results of Treatment of T-Cell Acute Lymphoblastic Leukemia (T-ALL) in Children in Uzbekistan

Indira Erimbetova MD, Sapura Ibragimova Dsc

Scientific and Practical Center for Pediatric Oncology, Hematology and Immunology

Tashkent, Uzbekistan

Introduction

T-cell acute lymphoblastic leukemia (T-ALL) is biologically distinct from its B lymphoblastic (B-ALL) counterpart and shows different kinetic patterns of disease response. Although very similar regimens are used to treat T-ALL and B-ALL, distinctions in response to different elements of therapy have been observed. Similar to B-ALL, the key prognostic determinant in T-ALL is minimal residual disease (MRD) response. Unlike B-ALL, other factors including age, white blood cell count at diagnosis, and genetics of the ALL blasts are not independently prognostic when MRD response is included. Thus, current efforts are focused on preventing relapse by augmenting therapy for high-risk patients, sparing toxicity in favorable subsets and developing new approaches for the treatment of recurrent disease.

Aim

To assess the effectiveness of therapy and prognostic value of various factors in children with T-ALL during the treatment protocol, ALL-MB-2015.

Objectives

31 patients with primary T-ALL aged from 1 to 18 years were treated according to the ALL-MB-2015 protocol (Table 1).

Table 1.

Risk group definitions

M1 marrow, less than 5% blasts; M2 marrow, 5-25% blasts; M3 marrow, more than 25% blasts by morphology; CNS1, less than 5 WBC/μL and no blasts in the CSF. *Central flow cytometry-based MRD.

Risk	ALL-MB T-ALL risk group definitions
Standard risk	M1 day 36 marrow; Day 36 MRD* <0.01%; CNS 1; no testicular disease; no steroid pretreatment, CD1A+, TSR-, day 15 marrow <30%
Intermediate risk	M1 or M2 day 36 marrow; day 36 MRD ≥ 0.01%; end-of-consolidation MRD < 0.1%; any CNS and testicular disease status; any steroid pretreatment status, CD1A+, TSR-, CD1A-, TSR-, day 15 marrow <30%
High risk	M3 day 36 marrow or end-of-consolidation MRD ≥0.1%, CD1A-, TSR+, day 15 marrow >30%

Methods

Diagnosis was based on clinical findings, myelogram, hemogram, and immunological and molecular genetic analyses. 11 (35,4%) patients had initial high number of white blood cells (more than 100 000), large spleen size - 5 patients (16,1%), >30% blast cells in bone marrow at day 15 induction – 7 patients (22,6%), and expression of CD1a antigen – 16 patients (51,6%). All patients received chemotherapy according to Intermediate Risk Group, including a weekly intramuscular injection of low-dose methotrexate and asparaginase, and additional intrathecal administration of three cytotoxic drugs

Results

After the induction course, 26 (83,8%) patients went into remission. Of the 31 patients, 2 patients (6.4%) died during induction. Of 3 patients who failed to achieve remission, 1 patient died of progressive disease and 2 patients in the intermediate-risk group continued with low-dose chemotherapy as part of their consolidation. These 2 patients did not meet the criteria for HRG therapy; 1 remained in complete remission, and the other had a relapse after another 1.5 years. One patient (3.2%) was lost to follow-up. Six (19.4%) patients of the 31 relapsed: one patient had isolated CNS relapse, and the other 5 patients had bone marrow relapse. The median of follow-up was 1 year . Three-year event-free survival was 61.2%.

Table 2. Results of therapy of patients with T-ALL

Indicator	Abs. number of patients - 31	%
Death by Induction	2	6,4
Refractory to therapy (non-responder)	3	9,6
Complete remission	26	83,8
Relapse: Bone marrow Isolated neurorelapse Combined (BM+CNS)	6 5 1 -	19,4 16,1 3.2 -
Death in remission	-	-
Lost From Follow-Up (LFU)	1	3,2
Complete long-term remission (CLR)	20	61,2

Summary

Our findings suggest that these patients with T-ALL were a heterogeneous group. In the current study, lower survival rates were reported in patients with an initial high number of white blood cells and large spleen size. Patients with poor response, which was an early indicator of worse survival, had more than 30% blast cells in bone marrow at day 15 induction. Expression of CD1a antigen, which is expressed only in the cortical thymocytes, was associated with a favorable outcome.

References

1.Raetz EA, Teachey DT. T-cell acute lymphoblastic leukemia. Hematology Am Soc Hematol Educ Program. 2016 Dec 2;2016(1):580-588. doi: 10.1182/asheducation-2016.1.580. PMID: 27913532; PMCID: PMC6142501.

2.Zhang J, Ding L, Holmfeldt L, et al. The genetic basis of early T-cell precursor acute lymphoblastic leukaemia. Nature. 2012;481(7380):157-163. [DOI] [PMC free article] [PubMed] [Google Scholar]

Indira Erimbetova MD Ped.hematologist erimbetova_med@mail.ru

Sapura Ibragimova (DSc, Ped.hematologist, Head of Oncohematology department) sapura.71@mail.ru