

Treatment results of childhood acute lymphoblastic leukemia using the COALL-Saint-Petersburg-92 protocol after a 10-year observation period

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Abstract

Between January 1999 and August 2008, a total of 272 newly diagnosed patients (pts) up to 18 years of age with ALL were treated according to the COALL-Saint-Petersburg-92 protocol (COALL-S-Pb-92). Since August 2008, the pediatric oncohematological clinics of St. Petersburg have been affiliated with the all-Russian study Moscow-Berlin 2008.

Methods: Protocol COALL-S-Pb-92 is a modification of the German protocol COALL-92. The intensive phase of treatment lasted 5.5 months in the low risk (LR) group and 8 months in the high risk (HR) group and consisted of 4 parts: induction, consolidation, CNS-treatment and reinduction. It was followed by maintenance treatment until 2 years from the date of diagnosis. Treatment of presymptomatic CNS disease consisted of i.th. MTX; cranial irradiation (12 Gy) was given additionally to HR pts with T-ALL and/or primary hyperleukocytosis. Pts were stratified into LR (n=129, 47%) or HR (n=143, 53%) groups. The criteria for HR were: initial white blood count $\geq 25000/l$, primary CNS and/or mediastinal involvement, T-cell and pre-pre-B-cell immunophenotype, an age ≥ 10 years, Ph-chromosome positivity, and failure to achieve remission at day 28 from the beginning of treatment.

Results: 266 pts (98%) achieved complete remission. 6 HR pts died during induction (hemorrhagic and infectious complications, progression of leukemia). There was only the one late responder, no non-responders. 18 pts died of infectious complications while in remission. 47 (17.7%) patients relapsed: 12.4% in the LR group and 22.6% in the HR group. Non-lethal complications—like mucositis, hepatotoxicity, hemorrhagic and infectious complications—were more frequent and severe in HR-group pts. After an observation time of 10 years, the estimate for EFS of all 272 valuable patients is $64.8 \pm 3.4\%$ (LR $74.7 \pm 4.4\%$, HR $55.9 \pm 4.9\%$), the estimate of probability of RFS is $75.9 \pm 3.4\%$ (LR $82.4 \pm 4.1\%$, HR $69.6 \pm 4.8\%$) and probability of overall survival is $76.0 \pm 3.1\%$ (LR $87.5 \pm 3.5\%$, HR $65.3 \pm 5.0\%$).

Conclusions: Treatment results based on the COALL-92 protocol have demonstrated an obvious improvement in comparison with previous results of leukemia chemotherapy in children in St. Petersburg. We are going to continue to follow up our COALL patients in order to be able to compare treatment results in different age and risk groups as well as long-term survival and treatment sequela with different treatment strategies.

Keywords: acute lymphoblastic leukemia, children, intensive chemotherapy