Abstract: P1751

Title: SAFETY AND EFFICACY OF BLINATUMOMAB AS BRIDGING THERAPY IN PEDIATRIC B-ALL PATIENTS WITH CHEMOTHERAPY INTOLERANCE: A MULTICENTER RETROSPECTIVE ANALYSIS

Abstract Type: e-Poster Presentation

Topic: Acute lymphoblastic leukemia - Clinical

Background:

Progress in the therapy of pediatric acute lymphoblastic leukemia (ALL) has been achieved through combination cytotoxic chemotherapy, leading to high cure rates, at the cost of significant life-threatening toxicity. The efficacy of therapy is compromised in a substantial minority who cannot continue protocol-mandated schedules because of toxicity, while patients with pre-existing comorbidities have inferior outcomes due in part to toxicity. Blinatumomab (Blina), a CD3-/CD19-directed bispecific T-cell engager, is more effective and less toxic in the relapse setting. As blinatumomab causes B-cell depletion, the safety of its use during severe chemotherapy-induced toxicity is unclear.

Aims:

To test whether blinatumomab is effective as a toxicity-sparing alternative to first-line intensive chemotherapy in children with B-ALL who were chemotherapy-intolerant.

Methods:

Clinical data of 35 patients with B-ALL who received Blina from 10 Children's Medical Centers of Hematology/Oncology between October 2021 and February 2024 were collected. Blina was given as a bridge to further therapy to patients with chemotherapy intolerance.

Results:

Among the 35 patients, 19 of them were males and 16 were females. The age of onset was 4.63±3.14 years. Thirty-four of these patients received Blina for overwhelming chemotherapy-associated toxicity, and one for underlying Down syndrome. Toxicity occurred mainly during induction (n=33), but also during re-induction (n=2). Nineteen events were caused by severe infections, including 5 sepsis, 9 severe pneumonia, 4 invasive fungal infection, 2 abdominal infection, 1 mucocutaneous and 1 intracranial infection. Other events included 5 severe pancreatitis, 3 gastrointestinal hemorrhage, 2 central nervous system thrombosis, 1 bone marrow failure, and 1 ileus. And three patients were allergic to asparaginase, resulting in the absence of this drug. The median delay time of chemotherapy was 46.71±12.70 days. Eight cases received a single 28-day cycle of blinatumomab, and 27 cases received a single 14-day cycle. 28 of 35 received Blina postinduction, and 7 cases received Blina mid-/post consolidation.

For all patients, Blina was well tolerated, with majority cases (18/27, 67%) having a grade(G)1/2 toxicity event and no case of G4/5 toxicity event. The events of adverse effects included thirteen cytokine release syndromes (G3, n=2), six infection (G3, n=4), two G1 elevated alanine aminotransferase, one G3 neurotoxicity, two G2 hypertriglyceridemia, one G1 emesis, and two G3 pancreatitis. However, all adverse effects were well cured and no toxic death happened.

In terms of efficacy of Blina, among the 15 patients who were MRD-positive pre-Blina, all cases responded at the end of cycle, with the remaining 20 remaining MRD-negative. Of the 5 cases of fusion gene-positive pre-Blina, all turned negative after Blina. After Blina treatment, the goal of bridging to further therapy was achieved in all 35 patients, with resolution of toxic events. At a median follow-up of 10 months, one patient had relapsed after an initial response to Blina, and the other patients were in complete remission of MRD. The 1-year event-free and overall survival for these patients were 97% and 100%, respectively.

Conclusion: Blinatumomab is safe and effective in first-line treatment of chemotherapy-intolerant children with B-ALL.

Keywords: Acute lymphoblastic leukemia, Immune therapy, Chemotherapy toxicity