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POSTER ABSTRACTS

704.CELLULAR IMMUNOTHERAPIES: EARLY PHASE AND INVESTIGATIONAL THERAPIES

A Multicenter Study of CAR-T Cell Therapy for Relapse of B-ALL Post Allogeneic Stem Cell Transplantation

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BACKGROUND: Patients with acute B-cell lymphoblastic leukemia (B-ALL) relapsed after allogeneic stem cell transplantation (allo-HSCT) have very poor prognosis. Chimeric antigen receptor T (CAR-T) cells targeting CD19 have been developed as one of the effective immunotherapies for relapsed/refractory B-ALL. The safety and efficacy of CAR-T cells in patients relapsed after allo-HSCT remain unclear.
METHODS: This study analyzed 60 B-ALL patients relapsed after allo-HSCT treated with CAR-T cells between October 2015 and February 2022 from four Chinese centers. Their pre-treatment patient characteristics, treatment regimens, efficacy, adverse effects, and follow-up data were comprehensively analyzed.
RESULTS: One patient refused efficacy evaluation. 7 patients died before day 28 after CAR-T infusion. A total of 52 were assessed for efficacy within 28 days after CAR-T infusion.76.92% (40/52) patients achieved complete remission (CR) at Day 28 after CAR-T infusion, including 38 patients who achieved MRD-negative CR. 4 of the 40 patients relapsed at a median follow-up date of 12.1 months. The 1-year OS and EFS of all patients were 52.8% ± 7.0% and 51.5% ± 7.0%, respectively, and the 2-year OS and EFS were 40.1% ± 8.6% and 45.1% ± 8.6%, respectively. Multifactorial analysis showed that patients with severe CRS had worse OS and EFS, and other factors including age, gender, site of CAR-T tumor involvement, type of previous transplantation, previous transplantation type, CAR-T product and CRS grade, etc., did not affect the long-term survival of patients.
The incidence of CRS was 80.00%, the incidence of grade ≥3 CRS was 20.83%, and the median time of CRS was 2 days after CAR-T cell infusion (range: 0-34 days). 3 patients (5.00%) died due to multiorgan failure caused by severe CRS, and the rest of the patients' CRS was controlled, and the grade of CRS was related to the proportion of blast cells in the bone marrow prior to CAR-T cell infusion., independent of the type of transplantation and the source of CAR-T cells. The incidence of ICANS was 5.00%. The incidence of aGvHD was 30.00%, and patients who had received prior haploidentical allogeneic HSCT were significantly more likely to develop aGvHD after CAR-T cell infusion than those who had received prior matched allogeneic HSCT. The occurrence of aGvHD after CAR-T treatment was not associated with the occurrence of CRS ($p = 1$), the presence of aGvHD after prior transplantation ($p = 0.3484$), the presence of cGvHD after prior transplantation ($p = 0.3167$), the presence of cGvHD at the time of CAR-T infusion ($p = 0.5136$), and the presence of prior donor lymphocyte infusion ($p = 0.7404$), and whether CAR-T cells were from autologous or donor ($p = 0.4819$).
CONCLUSIONS: CAR-T cells are safe and effective in treating B-ALL patients with post-transplant relapse, and donor-derived CAR-T cells do not exacerbate CRS with aGVHD, and there is a high incidence of aGVHD after CAR-T therapy in patients with HLA-haplotype-matched transplantation.

Disclosures No relevant conflicts of interest to declare.

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