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POSTER ABSTRACTS

721.ALLOGENEIC TRANSPLANTATION: CONDITIONING REGIMENS, ENGRAFTMENT AND ACUTE TOXICITIES

CD7 CAR-T Therapy Followed By a Second Transplant for T-Cell Acute Lymphoblastic Leukemia or Lymphoblastic Lymphoma Patients Who Relapsed after a Prior Transplant

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Background

The therapeutic options for patients with T-cell acute lymphoblastic leukemia or lymphoblastic lymphoma (T-ALL/LBL) who relapse after hematopoietic stem cell transplantation (HSCT) are currently restricted. CD7-targeted chimeric antigen receptor (CAR) T-cell therapy provides a promising avenue towards remission, yet the long-term prognosis for these patients still needs to be improved. The advantages of progressing to a second transplant post-CAR-T treatment remain uncertain due to limited data. In this study, we analyzed the clinical characteristics and transplantation outcomes of 16 T-ALL/LBL patients who, having relapsed after their initial transplantation, achieved complete remission (CR) in bone marrow (BM) and CR/partial remission (PR) in extramedullary lesions via CD7 CAR-T therapy and then opted for a second allogeneic HSCT (allo-HSCT) at our center. Our aim is to explore strategies to enhance the survival rate of these patients.

Methods

From January 2021 to January 2023, we analyzed T-ALL/LBL patients who underwent second transplantation at Hebei Yanda Lu Daopei Hospital. The patients included in this study met the following criteria: they had relapsed following their first HSCT and had subsequently undergone CD7 CAR-T therapy prior to the second transplantation. The follow-up cut-off date was till June 1, 2023. The median follow-up duration after the second transplantation was 178 days, ranging from 9 to 500 days.

Results

A total of 16 patients including 13 with T-ALL and 3 with T-LBL were enrolled. There were 14 males and 2 females. The donor of first transplantation was autologous(n=3), sibling identical(n=2), unrelated donor(n=2), or haplo-identical (n=9). After the first transplantation, 8 patients relapsed in bone marrow (BM) and 8 relapsed both in BM and extramedullary sites. Of these, 13 patients received autologous CD7 CAR-T, one patient received donor-derived CD7 CAR-T, and one patient was treated with universal CAR-T cells. After the CD7 CAR-T therapy, all 16 patients (100%) achieved minimal residual disease (MRD)-negative CR in BM, and 6 out of 8 patients (75%) achieved CR in extramedullary lesions. Only two patients exhibited PR in the extramedullary lesions.

The median age at the time of the second transplantation was 28 years (range 14-42 years). The median time from diagnosis to the second transplantation was 683 days (range 385-2672 days). The median interval between the first and second transplantation was 438 days (range 229-2540 days), and the median interval from CD7 CAR-T infusion to the second transplantation was 72 days (range 31-92 days).

For the second transplantation, 13 cases had haplo-identical donors and 3 cases had unrelated donors. The conditioning regimens utilized were either total body irradiation (TBI)-based (n=9), busulfan-based (n=6), or melphalan-based (n=1).

Following the 2 nd transplant, the 1-year overall survival(OS) and leukemia-free survival(LFS) were 58.5% (95% CI, 28.9-85.0%) and 51.4% (95% CI, 22.4-79.9%), respectively(Figure 1). The 1-year relapse incidence (RI) and non-relapse mortality (NRM) were 15.9% (95% CI, 4.4-57.8%) and 31.5% (95% CI, 13.2-74.9%), respectively. The cumulative incidence of CMV and EBV viremia at day 100 were 75.0% (95% CI, 56.5-99.5%) and 19.8% (95% CI, 7.2-54.6%), respectively. The cumulative incidence of all grades acute graft-versus-host disease (aGVHD) and 3-4 grade aGVHD at day 100 were 56.3% (95%CI, 36.5-86.7%) and 25%

(95%CI, 10.7-58.4%), respectively. One-year chronic GVHD(cGVHD) was observed in 25.1% of the cases (95%CI, 9.3-67.4%), while moderate to severe cGVHD was not found in any patient. Following the 2 nd transplant, a total of 6 patients died, including 3 from infection, 2 from relapse and 1 from intracranial hemorrhage.

Conclusions

Our initial findings suggest that even in refractory/relapsed T-ALL/LBL patients who have experienced relapse following previous HSCT, MRD-negative complete remission can potentially be achieved utilizing CD7 CAR-T cell therapy. The subsequent implementation of a second allo-HSCT appears feasible. Combining CAR-T therapy with a follow-up second HSCT presents a strategy for these heavily pre-treated patients, offering promising prospects for survival. However, further evaluation of this treatment approach is required, necessitating long-term monitoring and a larger patient cohort.

Disclosures No relevant conflicts of interest to declare.

Figure 1: Overall survival and leukemia-free survival of the 16 T-ALL/LBL patients after second transplantation.

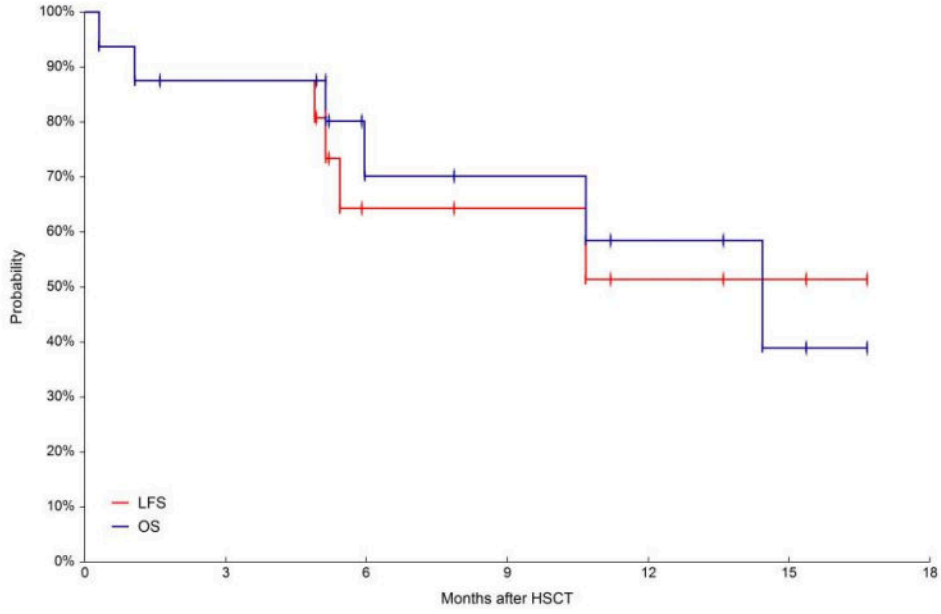

Figure 1

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