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POSTER ABSTRACTS

732.ALLOGENEIC TRANSPLANTATION: DISEASE RESPONSE AND COMPARATIVE TREATMENT STUDIES

Prognostic Factors Impacting Post-Transplant Outcomes in Adult T-Cell Acute Lymphoblastic Leukemia: A Registry-Based Study By the EBMT Acute Leukemia Working Party

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Background: T-cell acute lymphoblastic leukemia (T-ALL) predominantly affects individuals in late childhood and young adulthood and historically had high mortality rates. The outcome of Pediatric inspired chemo protocols in the T-ALL have improved in the past years due to the advancement in treatment and supportive care but the data is less mature, although adult patients still face challenges. Limited studies have directly explored the impact of patient- and transplant-related factors on post-transplant outcomes in adult T-ALL patients after allogeneic hematopoietic stem cell transplantation (allo-HSCT).
Methods: A retrospective registry-based analysis was conducted across multiple centers using data from the European Society for Blood and Marrow Transplantation (EBMT) registry. Inclusion criteria were adult T-ALL patients (>18 years old) who underwent their first allo-HSCT in first complete remission from matched sibling donors (MSD), unrelated donors (UD) (10/10 or 9/10) or haploidentical donors between 2010 and 2021. Cord bloods were excluded. Multivariable Cox regression analysis was performed to examine the associations between patient/transplant characteristics and outcomes.
Results: A total of 1907 patients were included in the study. The median age at transplant was 33.4 years (18.1-75). The median follow up was 2.9 years (2.6-3.1), and the median year of HSCT was 2016 (2010-2021). Patients were 70 % male with 67% being CMV-positive, at the time of transplant. Donors were predominantly male (64%), and (23%) of transplants involved female donors to male patients. The median period between diagnosis and HSCT was 5.9 months (0 -23.8). Most transplants were from matched sibling donors (MSD) (45%) followed by UD (43%) and 12% were from Haploidentical transplants. Most patients underwent myeloablative conditioning with total body irradiation (TBI)-based regimens (69%) and most patients received peripheral blood stem cells (84%). Cyclosporine with methotrexate was the most common graft-versus-host-disease (GVHD) prophylaxis (54 %). *In vivo* T cell depletion was used in 44%.
The 2-year overall survival (OS) was 69.4%, and leukemia -free survival (LFS) was 62.1%. The cumulative incidence of acute GVHD (aGVHD) grades II-IV at 100 days was 32.6%, and grades III-IV was 10%. The cumulative incidence of chronic GVHD (cGVHD) at 2 years was 37.3%, and extensive cGVHD was 16.8%. Multivariate analysis yielded significant associations between patient/transplant characteristics and outcomes. Advanced age at transplant was associated with poorer outcomes, including LFS (HR=1.11, p=0.004), GVHD-free, relapse-free survival (GRFS) (HR=1.06, p=0.04), OS (HR=1.12, p=0.002), and higher non-relapse mortality (NRM) (HR=1.23, p=0.001); HR for 10y increment. A later year of HSCT was associated with improved GFRS (HR=0.89, p=0.001), OS (HR=0.9, p=0.02), and decreased NRM (HR=0.82, p=0.008), aGVHD II-IV (HR=0.83, p=0.001), and cGVHD (HR=0.8, p=0.001); HR for 3y increment. TBI was specifically superior with improved LFS (HR=0.79, p=0.02), GRFS (HR=0.83, p=0.04), and lower relapse incidence (RI) (HR=0.65, p=0.001). Female-to-male transplant combination had a negative impact on GFRS (HR=1.21, p=0.02), OS (HR=1.23, p=0.048), and on the risk of cGVHD in general (HR=1.39, p=0.002) and specifically extensive cGVHD (HR=1.47, p=0.01). The use of *in vivo* T-cell depletion had significant benefits in terms of GFRS, aGVHD grade III-IV, cGVHD, and extensive cGVHD.
Conclusion: This large study identified prognostic factors, such as age at transplant, donor type, and conditioning regimen, in influencing key outcomes including OS, LFS, GVHD incidence, and NRM in adult T-ALL patients undergoing allo-HSCT. Importantly, a significant improvement over time in post-transplant outcomes was noted. These findings hold great promise for new adapted treatment strategies and can serve as a benchmark for future studies in that setting.

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Figure 1: Kaplan-Meier Analysis of Outcomes Following Haploidentical Stem Cell Transplantation in all patients.

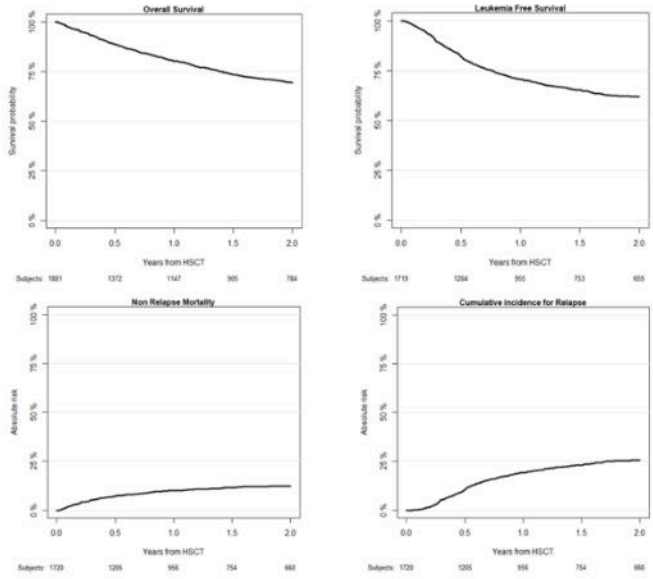

Table 2: Univariate Analyses of Patient Outcomes Following Allogeneic Hematopoietic Stem Cell Transplantation.

Outcomes measured	Outcome (Prob. [95% CI])
Median Follow-up (y)	2.9 (2.6 - 3.1)
OS (2 y)	69.4 (66.9 - 71.7)
PFS (2 y)	62.1 (59.5 - 64.6)
RI (2 y)	25.6 (23.3 - 27.9)
NRM (2 y)	12.3 (10.7 - 14)
GRFS (2 y)	45.3 (42.7 - 47.9)
aGVH-II/IV (100 d)	32.6 (30.3 - 34.8)
aGVH-III/IV (100 d)	10 (8.6 - 11.6)
CGVHD (2 y)	37.3 (34.8 - 39.9)
CGVHD Ext (2 y)	16.8 (14.8 - 18.9)

Figure 1

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