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Related T-Cell Depleted HLA-Haploidentical Stem Cell Transplantation (TCD-Haplo) versus Umbilical Cord Blood Transplantation (UCBT) in Pediatric Patients with Acute Leukemia, a Eurocord, CBC-CTIWB, PDWP-EBMT Study

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Introduction: TCD-Haplo and UCBT have been used effectively in the treatment of children with acute leukemia in need of an allograft and lacking a standard donor. To date, there are no study comparing the outcomes of these transplant approaches in this population.

Materials (or patients) and methods: We performed a retrospective registry based of children with either ALL or AML who received a TCD-Haplo or single UCBT after myeloablative conditioning regimen. Method of T-cell depletion was available for 169 TCD-Haplo grafts: CD34+ positive selection $n=120$, negative depletion $n=49$ (CD3/CD19 $n=19$; TCR alpha/beta+ cell $n=30$). Transplants were performed from 2001 to 2012 in EBMT centers; 1180 patients (pts) received UCBT (AML $n=400$; ALL $n=780$) and 215 TCD-Haplo (AML $n=83$; ALL $n=132$). Median follow-up was 49 months for TCD-Haplo and 33, for UCBT. Compared to TCD-Haplo. UCBT recipients were younger (median age 5.9 vs 10.3 years, $P=<0.0001$), were transplanted more often in CR1 (40%vs24%, $P=<0.001$) and less frequently in advanced disease (9% vs 20%, $P=<0.001$). Median interval from diagnosis to transplant was 572 days for TCD-Haplo and 372 days for UCBT ($P<0.001$). Conditioning regimen was mainly TBI-based in 88% of TCD-Haplo vs 82% of UCBT.

Results: Acute GVHD (grade II-IV) incidence was 18% and 37% ($P<0.001$) and chronic GVHD was 14% and 16%, ($P=0.40$) for TCD-Haplo and UCBT, respectively. Univariate analysis in ALL pts ($n=912$) showed no significant difference in the 2-year leukemia-free survival (LFS) 34% vs 41% ($P=0.313$) between TCD-Haplo and UCBT, with a cumulative incidence (CI) of non-relapse mortality (NRM) 24% vs 30% ($P=0.162$) and relapse incidence (RI) 42% vs 29% ($P=0.007$) respectively. For pts in CR1, 2-year RI was 20% vs 22%, $P=0.741$; NRM 23% vs 24%, $P=0.887$; and 2- year LFS 57% versus 55%, $P=0.682$, for TCD-Haplo and UCBT, respectively. For pts in CR2, 2-year RI was 41% vs 31%, $P=0.120$; NRM 27% vs 33%, $P=0.173$; and 2-year LFS 33% vs 36%, $P=0.940$, for TCD-Haplo and UCBT, respectively. In adv disease, 2-year LFS was 6% vs 11%, $P=0.147$ for TCD-Haplo and UCBT.

AML Pts ($n=483$) receiving TCD-Haplo had lower LFS: 30% vs 45% for UCBT ($P=<0.0001$), RI 40% vs 28% ($P<0.001$) respectively, with no difference in CI of NRM (30% vs 27%; $P=0.621$). According to disease status: for AML pts in CR1 the 2-year RI was 25% vs 16%, ($P=0.438$), NRM 54% vs 17% ($P<0.001$) and 2-year LFS 21% vs 67% ($P=<0.001$) in TCD-Haplo and UCBT respectively. For AML pts in CR2, 2-year RI was 28% vs 25%, ($P=0.639$), NRM was 40% vs 24%($P=0.075$), and 2-year LFS was 33% vs 51% ($P=0.037$), for TCD-Haplo and UCBT respectively. For AML pts with adv disease 2-year LFS was 12% for TCD-Haplo and 16% for UCBT ($P=0.754$).

In multivariate analysis for pts with ALL, disease status was the only factor associated with better LFS (HR 4.84, $P<0.0001$). UCBT was associated with a lower risk of RI (HR 0.69, $P=0.029$).

For AML, UCBT was associated with lower RI (HR 0.52, $P=0.007$), lower NRM (HR= 0.577; $P=<0.019$), and better LFS (HR 0.575; $P=<0.001$) when compared to TCD-Haplo. Adv disease was associated with lower LFS and higher RI.

Conclusion: In conclusion, children with ALL have comparable LFS after either UCBT or TCD-Haplo. By contrast, in children with AML, UCBT is associated with lower RI and NRM than TCD-Haplo, translating into better LFS.

Disclosure of Interest: None declared.