overall survival (OS) was 54% (95% CI 41–66%) for the entire cohort with an OS for NNGF of 73% (95% CI 55–85%) and for NGF OS was 30% (95% CI, 14–47%) (p<0.001). A second GF occurred in 18 (67%) NGF and in 9 (26%) NNGF patients. Viral studies showed there was more frequent HHV6 reactivation, with 48% of the NGF group versus 8.8% of the NNGF group (p<0.01) having reactivation. EBV and CMV reactivation was not different. The most common cause of death after second HCT was persisting GF leading to infection or infection despite engraftment. Outcomes of second HCT for NGF and NNGF are different with very poor outcomes for the NGF group, necessitating new approaches to improve overall survival.

B-cell immune dysfunction substantially contributes to the risk of severe infections after allogeneic hematopoietic stem cell transplantation (allo-HST). B-cell numbers normalize within one year after transplantation, however many patients display a slow recovery of CD27⁺ memory B cells and week vaccination responses. Little is known about functional B-cell deficits associated with memory deficiency post-transplant.

In our study we quantitatively and phenotypically analyzed B- and T-cell subsets in peripheral blood by flow cytometry at days 180 and 360 after alloHST in acute leukemic patients (n=36). In addition, apoptosis of B-cell subsets was investigated after stimulation with CpG and CD40L. To address the B-cell milieu cytokines and chemokines were measured with Luminex technology. Half of patients at day 180 and all patients at day 360 displayed fully restored absolute B-cell numbers, although CD27⁺ memory B-cell subsets remained diminished (cells/μl±SEM: healthy control (HC) 26±4; alloHST 4±1; p<0.001). All B-cell subsets were characterized by an activated/pro-apoptotic phenotype with an increased CD86 and Fas but reduced Baff-R expression at day 180. Accordingly, an activated/pro-apoptotic phenotype with an increased CD86 and Fas but reduced Baff-R expression at day 180. Accordingly, an activated/pro-apoptotic phenotype with an increased CD86 and Fas but reduced Baff-R expression at day 180. Accordingly, an activated/pro-apoptotic phenotype with an increased CD86 and Fas but reduced Baff-R expression at day 180. Accordingly, an activated/pro-apoptotic phenotype with an increased CD86 and Fas but reduced Baff-R expression at day 180.

Immune Recovery (IR) Following Allogeneic Stem Cell Transplant (Allo-SCT): A Comparison of Three Different Transplant Strategies at a Single Transplant Center
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Introduction: Favorable IR after allo-SCT has been reported after reduced intensity conditioning (RIC); however, T-cell depletion and cord blood (CB) SCT have been associated with delay in IR. The goal of this study is to compare the rates of IR using three different transplant strategies employed at UMass Memorial Medical Center.

Patients & Methods: We retrospectively analyzed data of all patients who underwent allo-SCT at our institution since April 2009 using either RIC with thiota/p/idarabine/melphalan followed by post-transplant cyclophosphamide (TM/Cy) arm, RIC with Fludarabine/Busulfanx2/antithymocyte globulin (FluBu2/ATG arm) or CB transplant with TFM/ATG regimen. IR was assessed by rates of recovery of lymphocyte subsets (CD3, CD4, CD19, CD25+127- and NK-cells) and serum immunoglobulins (Ig’s) at D30, D100 and 1 year post transplant.

Results: 102 patients were identified from the database. 38 patients (37.2%) were included in the TM/Cy arm, 38 patients (37.2%) in the FluBu2/ATG arm and 26 patients (25.5%) in the CB arm. Median age of all patients was 62.2 years (range 18.4 – 83.5) and 52.4, 67.5, and 63 years in the TMF/ Cy, FluBu2/ATG and CB arms, respectively. Median lymphocyte subset counts and Ig levels at different post transplant points are detailed in Table 1. CD3 and CD4 recovery was significantly inferior in the CB arm at D30 and D100. There was a trend towards delayed IR of regulatory T-cells (CD25+127-) in the CB arm at all points. CD19 and NK-cell recovery was superior in the CB arm at all points, but NK-cell recovery did not reach statistical significance at 1 year. Recovery of serum Ig’s was noted to be faster in the FluBu2/ATG arm early on post transplant. At 1-year post allo-SCT, Ig values were comparable in all arms.
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Harvard Medical School, Boston, MA; 2 Biostatistics and Hematology-Oncology, Beth Israel Deaconess Medical Center, determined that recovery of T-cell receptor excision circles (TRECs), plays a critical role in the clearance of CMV viremia and is associated with delayed thymic reconstitution, as determined by assessment of T-cell subsets after double unit UCBT (dUCBT). Previously we reported that CB allo-SCT with TFM/Cy or ATG conditioning was associated with faster recovery of NK-cells and CD19 cell; however with delayed recovery of T-lymphocyte subsets. Recovery of T-lymphocyte subsets was almost comparable in both arms receiving allo-SCT with RIC regimen regardless of the use of post-tx Cy vs ATG. FluBu2/ATG regimen was associated with faster recovery of serum Ig’s in the early post-transplant period.

**Conclusion:** Our results show that CB allo-SCT with TFM/ATG conditioning was associated with faster recovery of NK-cells and CD19 cell; however with delayed recovery of T-lymphocyte subsets. Recovery of T-lymphocyte subsets was almost comparable in both arms receiving allo-SCT with RIC regimen regardless of the use of post-tx Cy vs ATG. FluBu2/ATG regimen was associated with faster recovery of serum Ig’s in the early post-transplant period.

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**Prognostic Value of IL-7 and SCF Levels on Thymic Reconstitution and Clinical Outcomes after Double Umbilical Cord Transplantation in Adults**


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Umbilical cord blood transplantation (UCBT) is characterized by delayed immune reconstitution even with the use of double unit UCBT (dUCBT). Previously we reported that reconstitution of thymopoiesis, as determined by assessment of T-cell receptor excision circles (TRECs), plays a critical role in the clearance of CMV viremia and is associated with improved overall survival in dUCBT recipients. We also determined that recovery of specific T-cell subsets after dUCBT correlates with serum levels of Interleukin 7 (IL-7) and Stem Cell Factor (SCF). Here we investigated whether thymic reconstitution depends on IL-7 and SCF and examined the prognostic role of TRECs, IL-7 and SCF levels in clinical outcomes after dUCBT. Fifty-two patients with hematologic malignancies received dUCBT following either reduced-intensity (fludarabine, melphalan and antithymocyte globulin) or myeloablative conditioning (fludarabine, cyclophosphamide and TBI). GvHD prophylaxis was tacrolimus in combination with sirolimus or mycophenolate mofetil. The incidence rates of grade II-IV acute GvHD and chronic GvHD were 15.4% and 29% respectively. The 5-year cumulative incidence of relapse, non-relapse mortality (NRM), progression-free survival (PFS) and overall survival (OS) were 43%, 31%, 26%, and 41% respectively. During the first 3 months after dUCBT, TRECs remained undetectable or extremely low but, at 6 months, 69.7% of patients had detectable levels. At one year, TRECs were detectable in 86.6% of patients with a median value of 2404 copies/ug DNA. Serum levels of IL-7 increased 3-fold from baseline by 1 month after dUCBT, remained elevated through the first 3 months, and gradually declined to pre-transplant levels by 1 year. SCF levels peaked at 2 months after dUCBT and gradually declined thereafter. We observed a statistically significant inverse correlation between TRECs and IL-7 (p=0.036) or SCF (p<0.02) serum levels at various time points after dUCBT, suggesting that uptake of these two cytokines by thymocytes may lead to their differentiation into TREC-containing Recent Thymic Emigrants (RTE). In multi-variable analysis, higher TRECs levels independently correlated with improved OS (p<0.02) and lower NRM (p<0.008). Conversely, higher levels of SCF and IL-7 correlated with lower OS (p=0.005 and p<0.0001). Furthermore, SCF level predicted NRM (p<0.003), whereas serum IL-7 level independently predicted cGVHD (p=0.03). Taken together, our findings suggest that high IL-7 and SCF serum levels are associated with delayed thymic reconstitution and may predict adverse outcomes after dUCBT, including cGVHD, NRM and OS.

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**Chimerism, Immune Reconstitution and Outcome after Allogeneic Myeloablative and Reduced Intensity Unrelated and Haploidentical PBSC Transplantation Using Post-Transplant Cyclophosphamide**

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