Table 1. Survival Outcomes of Second Transplants: Patient Characteristics

Patient characteristics	All patients (%)	Auto → Auto	Auto → Allo	Allo → Allo
All patients	52 (100%)	12 (23%)	31 (60%)	9 (19%)
Matched Related Donors(MRD)	17 (33%)	0 (0%)	13 (25%)	4 (8%)
Unrelated Donors(URD)	21 (39%)	0 (0%)	18 (35%)	3 (6%)
Autologous Donors	12 (23%)	12 (23%)	0 (0%)	0 (0%)
Syngeneic Donors(Syn)	2 (4%)	0 (0%)	0 (0%)	2 (4%)
Overall survival (1yr)	47% (95% CI 40%-54%)	64%	37%	56%
Overall survival (5yrs)	32% (95% CI 25%-39%)	18%	32%	44%
Relapse at 1 yr	17 (33%)	4 (7%)	12 (23%)	1 (2%) Syn
Treatment related mortality (TRM) at 1 yr	8 (15%)	0 (0%)	5 (10%)	3 (6%)
Cause of death at 1 yr			4 (8%)%MOF;1(2%) GVHD	2 (4%) GVHD;1(2%) PTLD
Acute GVHD(III-IV)	2 (4%)	0 (0%)	1 (2%)	1 (2%)
Chronic GVHD(flare)	18 (35%)	0 (0%)	13 (25%)	5 (10%)
Chronic GVHD(De novo)	2 (4%)	0 (0%)	2 (4%)	0 (0%)

Auto indicates Autologous; Allo, allogeneic; GVHD, graft versus host disease.

transplant. Median survival of patients who survived beyond first 30 days after second transplant was 352 days (36-5777 days). The cumulative incidence of grade III-IV acute GVHD was 10 % (n = 2). The cumulative incidences of relapse at 1 and 5 years were 33% and 43% respectively. Probabilities of overall survival at 1 and 5 years were 47% (95% CI 40-54%) and 32% (95% CI 25%-39%), respectively. Disease recurrence was most frequent primary cause of death in 33 % (n = 18) pts at 1year. TRM was 7% at 30 days; 11% at 100 days and 15% at one year. The causes of TRM at one year included GVHD: 6 % (n = 3), multi organ failure: 7% (n = 4), PTLD 2% (n = 1).
Conclusion: Patients undergoing second transplants can achieve long term survival beyond 5 years. Relapse, GVHD or early TRM are still causes of morbidity after second transplant.

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RADIATION EXPOSURE FROM DIAGNOSTIC PROCEDURES IN ALLOGENEIC STEM CELL TRANSPLANTATION DOES NOT SIGNIFICANTLY IMPACT OVERALL SURVIVAL OR NON-RELAPSE MORTALITY

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Introduction: Diagnostic radiology procedures in the context of allogeneic stem cell transplantation (ASCT) impose an unknown risk of radiation exposure. We conducted a retrospective study on radiation exposure in the peri-transplant period to define this risk.
Methods: 64 consecutive patients underwent sibling ASCT after conditioning with TBI 1200 cGy or 400 cGy, fludarabine 125 mg/m2 and cyclophosphamide 120 mg/kg utilizing CD34+ selected PBSC and cyclosporine as GVHD prophylaxis. 24 patients received 5x10 e6 CD3+/kg donor lymphocytes selectively depleted of alloreactivity by ex vivo photodepletion.

Diagnostic procedures (X-rays, CT Scans, fluoroscopy, and nuclear medicine (NM)) were documented for each individual in three periods (day-30 to 0, day +1-100 and day +101-200). Radiation exposure was calculated using the "effective dose" (ED) in mSv by measurement or from literature review. Overall survival (OS) and nonrelapse mortality (NRM) were evaluated in 55 subjects who survived >200 days in univariate analysis and multivariable Cox models. The variables for the cumulative and the periodic ED were forced into the models.
Results: Patients underwent a median of 11 X-rays, 10 CT-scans, 0 nuclear medicine studies, and 1 fluoroscopic procedure. The median cumulative radiation exposure from diagnostic radiology procedures was 91.6 mSv (range 1.2-300.1), equivalent to <10% of a standard 1200 TBI dose. 29% of the cumulative ED was delivered from day -30 to 0, 65% from day +1-100 and only 6% from day +101-200. The relative contributions from CT scans, X-rays, fluoroscopy, and NM were 88%, 6%, 5% and <1%, respectively.

In univariate analysis, the cumulative dose of incidental radiation from day -30 to +200 ($p<0.03$) and from day -30 to +100 ($p<0.05$) were significantly associated with OS. The cumulative dose of incidental radiation from day-30 to +100 was also significantly associated with NRM ($p<0.03$).

In multivariable analysis, cumulative doses of radiation lost statistical significance and were displaced by serum creatinine and serum albumin in the final models for OS and by albumin, acute GVHD and photodepletion for NRM.
Conclusions: Total radiation exposure from diagnostic radiation was only a small fraction of radiation utilized in conditioning. CT scans provided ~90% of the radiation exposure. While the cumulative dose of incidental radiation exposure was associated with OS and NRM in univariate analysis, it was not significant in multivariable analysis.

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HIGH RESOLUTION 9/10 OR 10/10 HLA MATCHED UNRELATED DONOR STEM CELLS CONTRIBUTE A BETTER OUTCOME OF TRANSPLANT IN SEVERE THALASSEMIA PATIENTS

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We reviewed transplant outcome in 34 consecutive children and adolescents with severe thalassemia who underwent allogeneic stem cell transplantation with unrelated donors between September 1992 and July 2011. The first cohort 22 patients underwent transplant from 4/6, 5/6 or 6/6 allele HLA matched unrelated donors and the second cohort 12 patients underwent transplant from 9/10 or 10/10 HLA matched unrelated donors. The myeloablative conditioning regimen (MC) consisted of cyclophosphamide, busulfan (BU), fludarabine (FLU) and antithymocyte globulin (ATG) and nonmyeloablative (NC) consisted of BU, FLU and ATG. The GVHD prophylaxis for MC consisted of tacrolimus and MTX and for NC consisted of tacrolimus and MMF. The purpose of NC was for toxicity reducing in the patients older than 10 years of age. Of 34 patients, 29 received bone marrow, 4 received peripheral blood and 1 received cord blood stem cells. The 2-year thalassemia-free survival rate for the first 22 cohort patients was 71% and 93% for the second cohort 12 patients ($p = 0.045$). We suggest that high resolution 9/10 or 10/10 matched unrelated donor stem cells may significantly improve the thalassemia free survival among severe thalassemia patients who underwent unrelated donor transplantation.

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CLINICAL OUTCOMES AND COSTS OF SECOND ALLOGENEIC HEMATOPOIETIC CELL TRANSPLANTATION

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Background: In this era of growing health care costs, the decision to proceed with a second allogeneic transplant has financial as well as clinical implications.
Methods: We analyzed all medical costs for the transplant process from the beginning of conditioning to 100 days after the transplant for 55 patients who underwent second allogeneic transplants from 1/19/05 to 4/9/10 at the University of Washington/Seattle Cancer