stem cell transplantation. Overall, we propose that combination of Bu with 2 nucleoside analogs can be utilized to improve currently available treatment programs for advanced myeloid leukemias.

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LONG-TERM SURVIVAL AFTER T-CELL DEPLETED ALLOGENIC STEM CELL TRANSPLANTATION IN PATIENTS WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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T-cell depleted allogeneic hematopoietic stem cell transplants (TCD-HSCT) have demonstrated durable disease free survival with a low risk of graft vs. host disease (GVHD) in patients with AML, MDS and NHL. We investigated this approach in 60 consecutive adult patients with AML who underwent TCD-HSCT from May 1997 through December 2008. Patients received myeloblative cytoreduction consisting of hyperfractionated total body irradiation (1375-1500cGy), followed by thiotepa (10mg/kg) and either cyclophosphamide (120mg/kg, n = 22) or fludarabine (125mg/m2, n = 38). No immunosuppressive agents were used post-HSCT. There were 39 males and 21 females. The median age was 16 years (range, 18-63). Twenty-seven patients were in hematologic CR1, 18 in CR2, 11 in CR3 or greater, and 4 patients had relapsed or refractory disease. Baseline cytogenetics were classified as poor risk (n = 26, including Ph + = 17), standard risk (n = 26), good risk (n = 4) or non-evaluable (n = 4). Forty-eight patients had a B-cell and 10 a T cell phenotype (multilineage = 1, unknown = 1). Bone marrow grafts were depleted of T-cells by soybean lectin agglutination and sheep erythrocyte rosette depletion and PBSC grafts underwent CD34+ positive selection using the ISOLEX 300i Magnetic Cell Separator and sheep erythrocyte rosette depletion. Twenty-four patients received grafts from HLA matched related donors (MRD), 8 from a single allele disparate related donor (MMDR), 15 from HLA matched unrelated donors (MUD), 13 from HLA mismatched unrelated donors (MMUD). With a median follow-up of 8.4 months (range 0.2-149 months), 5-year overall survival (OS) and progression-free-survival (PFS) were 45% and 30%, respectively. The relapse rate was 30% in patients in CR at time of HSCT. The 4 patients with relapsed or refractory disease died of relapse (n = 3) or infection (n = 1). Ten of 58 evaluable patients (17%) developed grade 2-3 aGVHD post-HSCT (MRD = 2, MUD = 3, MMDR = 4, MMUD = 1); cGVHD occurred in 13% evaluable patients. We examined factors that predict outcomes in patients with AML, and we found that only disease status at time of HSCT predicted PFS (p < 0.001). Pre-HSCT LDH was predictive of OS (p = 0.047). No effect was observed for cytogenetics, WBC at diagnosis, or presence of extramedullary disease. While TCD-HSCT does provide acceptable OS and PFS without GVHD in adult patients with AML, relapse remains a limiting factor. Future studies focusing on novel conditioning regimens and/or maintenance therapy are warranted.

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THE SLOPE OF CIRCULATING BLAST CLEARANCE DOES NOT PREDICT DISEASE RELAPSE AFTER ALLOGENIC STEM CELL TRANSPLANTATION

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Introduction: Leukemic relapse following initial induction chemotherapy has been predicted independently by the rate of peripheral blast clearance in adult AML and pediatric ALL. This early response to therapy in de novo acute leukemia may indicate in vivo chemosensitivity of malignant cells. No reports exist on whether blast response is predictive of relapse after myeloablative conditioning for allogeneic hematopoietic stem cell transplantation (AlloHSCT).

Methods: We analyzed 69 patients with AML (n = 47), MDS (n = 17), and ALL (n = 5) who had circulating blasts prior to busulfan- or TBI-based myeloablative AlloHSCT at a single academic center from 1998 to 2009. Individual regression slopes for consecutive values of circulating blasts were calculated throughout conditioning chemotherapy. Relapse-free (RFS) and overall survival (OS) were estimated by Kaplan-Meier method and Cox proportional hazards model.

Results: The median age of patients (49% males) was 47 years (range, 20-62). 31 (45%) received more than one prior chemotherapy regimen; 31 (45%) had unrelated donor AlloHSCT; 14 (20%) received TBI-based preparation; 34 (49%) relapsed after AlloHSCT. 80 (73%) patients were able to clear their circulating blasts within median of 6.5 days (range, 2-10). Time to blast clearance was associated with underlying malignancy (median of 4, 7, and 8 days for ALL, MDS, and AML respectively, p < 0.001) and myeloblastic conditioning (median of 4 days for TBI vs. 8 days for busulfan-based preparation, p < 0.001). Median average slope of blast clearance was -15.9 per day (range, -65.2 to 10.3). Neither velocity of blast decline (p = 0.4) nor the number of days to circulating blast clearance (p = 0.35) was predictive for time to disease relapse. More than one previous chemotherapy was associated with higher relapse rate (hazard ratio [HR] = 2.5, p < 0.01) and worse OS (HR = 2.2, p < 0.01), while receiving TBI-containing preparation portended poor OS (HR = 2.3, p < 0.01) in multivariable analysis.

Conclusions: The number of previous chemotherapies, but not the slope of circulating blast decline during myeloablative conditioning for AlloHSCT, predicted disease relapse and OS in patients with circulating blasts.

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MOST PATIENTS WITH CBF LEUKEMIA WILL REQUIRE HSCT FOR LONG TERM DISEASE CONTROL: RESULTS OF COHORT OF UNSELECTED PATIENTS

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Patients with CBF-AML are regarded as having a favorable outcome when treated with anthracycline-based induction chemotherapy and multiple cycles of high-dose cytarabine consolidation. Most data indicating the favorable prognosis of CBF-AML with non-HSCT management originates from young selected patients participating in clinical trials with scarce information on salvage treatment. We performed a retrospective analysis of 30 consecutive patients diagnosed with CBF-AML (14 with t(8,21) and 16 with inv (16)) at a regional leukemia center over twelve years to assess long term survival and the likelihood of therapeutic success without ever requiring HSCT. We reviewed the charts of all patients with CBF-AML (irrespective of other cytogenetic abnormalities) to extract demographic, treatment, and outcome information. Survival status and subsequent treatments in other institutions were determined by contacting the patient, attending physician or review of public death records. All patients were treated with curative intent with anthracycline-based induction therapy, and 47% were on clinical trials. Median age at diagnosis was 43 years (range 18-69). There was no detectable leahter during induction therapy and 22 (73.3%) achieved a complete remission with initial induction therapy. Median follow up for survivors was 35.3 months (range 6.4-117.4) with all survivors currently in remission. Overall 13 patients (43.3%) have required some modality of HSCT. Six patients received HSCT in CR1 due to perceived high risk of relapse (5 autologous, 1 allogeneic), none of which have relapsed. Among the 16 patients receiving non-transplant consolidation in CR1, 6 have subsequently relapsed and required a HSCT (3 autologous, 3 allogeneic) and 3 of these patients are alive 20.9-117.4 months from the initial diagnosis. Seven patients received HSCT in CR2 or in relapse (4 autologous, 3 allogeneic) and 6 of these patients are long-term survivors. Estimated 5 year overall survival for the entire cohort is 58.8 +/- 10.8%, comparable to what has been described for younger patients entering clinical trials (Grimwade et al, 2010). The likelihood
of survival at 5 years without requiring HSCT was only 28.1% +/- 8.8%. We conclude that only a minority of patients with CBF leukemia will be long term survivors relying exclusively on conventional chemotherapy. Early use of HSCT for high-risk CBF-AML should be pursued in clinical trials.

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**COMPARISON OF CONDITIONING REGIMENS BU-CY AND FLU-BU12-TG USED IN THE PATIENTS UNDERGOING ALLOGENEIC STEM CELL TRANSPLANTATION (SCT) FOR ACUTE MYELOID LEUKEMIA (AML)**

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**Introduction:** Standard myeloablative conditioning combined busulfan (16 mg/kg) and cyclophosphamide (120 mg/kg) (BU-CY) is associated with high non-hematologic toxicity, significant morbidity and mortality. Regimen combined fludarabin (125 mg/m²), busulfan (12 mg/kg) and thymoglobuline (6 mg/kg) (FLU-BU12-TG) might be less toxic and safer despite the myeloablative dose of busulfan. Retrospective study compared the results of allogeneic SCT after those two regimens in the patients with AML.

**Patients and Methods:** 21 patients with AML were allografted after BU-CY and 10 ones after FLU-BU12-TG. There were no differences between those groups in: the number of patients allografted in complete remission of AML, gender and age of patients and donors, the quality of graft and follow-up period. Significantly more patients in the group of FLU-BU12-TG were allografted from unrelated (90% vs. 19%; P=0.00018) and HLA mismatched donor (50% vs. 0%; P=0.0004). The incidence and risk of acute and chronic graft versus host disease (GVHD), AML relapse, non-relapse (NRM) and overall mortality, the probability of event-free (EFS) and overall survival (OS) were analysed and compared in both conditioning groups.

**Results:** No significant differences were found between the BU-CY and FLU-BU12-TG in the incidence of acute (38% vs. 50%; P=0.53) or chronic GVHD (44% vs. 33%; P=0.38), AML relapse (24% vs. 11%; P=0.40), NRM (33% vs. 10%; P=0.17), overall mortality (52% vs. 20%; P=0.087), the probability of 2-year EFS (50% vs. 89%; P=0.19) and OS (55% vs. 80%; P=0.28).

**Conclusion:** Regimen FLU-BU12-TG seems to be a feasible alternative approach to the patients allografted for AML and requiring pretransplant cytoreduction but standard myeloablative conditioning would be associated with the significant risk of severe complications.

**LYMPHOMA/MULTIPLE MYELOMA**

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**MAINTENANCE THERAPY WITH LOW DOSE THALIDOMIDE, DEXAMETHASONE AND CLARITHROMYCIN (BIRD) FOLLOWING AUTOLOGOUS TRANSPLANT (ASCT) FOR MULTIPLE MYELOMA (MM)**

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Since relapse remains a major cause for treatment failure after ASCT for MM, the role of maintenance therapy has been studied. Neither the best maintenance regimen nor optimal duration of therapy post ASCT has been established. Niesvizky et al (Blood 111: 1101-09, 2008) reported on the efficacy of BIRD as front-line therapy for MM, with 90% objective response rate and manageable toxicities. Thus, it seemed reasonable to study such a regimen as maintenance therapy post ASCT. Thirty-one patients (Stage I/II, n = 13 and stage III, n = 18 by Durie-Salmon criteria) were treated. Before ASCT, 81% received Thalidomide, 23% Lenalidomide, and 45% Bortezomib; 58% were treated with > 1 regimen (range 1-4) prior to mobilization. Cytogenetic abnormalities included: poor prognosis (23%), del13 by FISH (13%), t11/14 (10%), and tris 11/14, then increased to 100 mg po daily. After one year of combination therapy, dexamethasone and Clarithromycin were stopped. Thalidomide was given as long as tolerated until disease progression. Aspirin and low dose coumadin were used as DVT prophylaxis. Six patients (22%) discontinued thalidomide for progressive disease. Neuropathy was the most common toxicity: 12 patients (44%) stopped because of unimproved grade 2 toxicity and 7 (26%) required dose reduction of thalidomide. One patient stopped therapy because of rash. Median time to stopping Thalidomide was 13.5 months (range 6-42 months). Nine patients (33%) required dose reduction of dexamethasone. The number of infections included: pneumonia (n = 3), upper respiratory viral infection (n = 2), sinusitis (n = 1), and bronchitis (n = 3). Seven patients have died due to infection (n = 1), MM (n = 5), and complications of second ASCT (n = 1). As of 7/12/10, 20 patients (74%) are alive and 13 (48%) are alive without disease progression. Median follow-up is 59.5 months (38-73 months). In summary, BLT-D can be given post ASCT. Peripheral neuropathy was the most significant toxicity that required patients to stop therapy. With a median follow-up of 59.5 months from ASCT, 48% of the patients are alive without evidence of disease progression and 74% are alive. Randomized studies to compare one maintenance regimen to another are needed post ASCT.

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**MAINTENANCE THERAPY WITH LENALIDOMIDE, DEXAMETHASONE AND CLARITHROMYCIN (BIRD) FOLLOWING AUTOLOGOUS TRANSPLANT (ASCT) FOR MULTIPLE MYELOMA (MM)**

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Since relapse remains a major cause for treatment failure after ASCT for MM, the role of maintenance therapy has been studied. Neither the best maintenance regimen nor optimal duration of therapy post ASCT has been established. Niesvizky et al (Blood 111: 1101-09, 2008) reported on the efficacy of BIRD as front-line therapy for MM, with 90% objective response rate and manageable toxicities. Thus, it seemed reasonable to study such a regimen as maintenance therapy post ASCT. Thirty-one patients (Stage I/II, n = 13 and stage III, n = 18 by Durie-Salmon criteria) were treated. Before ASCT, 81% received Thalidomide, 23% Lenalidomide, and 45% Bortezomib; 58% were treated with > 1 regimen (range 1-4) prior to mobilization. Cytogenetic abnormalities included: poor prognosis (23%), del13 by FISH (13%), t11/14 (10%), and tris 11/11q (10%). PBSC were collected in 80% of patients off chemotherapy/growth factor. At ASCT, 42% of patients were in PR, 6.5% had SD, and 6.5% had progressive disease. All patients were conditioned with melphalan 200mg/m²; one patient was treated after planned tandem. At median of 113 days (range 49-133) and after recovery from acute toxicity of ASCT, patients were treated with Clarithromycin 250 mg po bid, Dexamethasone 20 mg po weekly, and Lenalidomide 25 mg po daily 1-14 every 21 day cycles. After one year of combination therapy, dexamethasone was tapered off and Clarithromycin was stopped. Lenalidomide was continued as long as tolerated until disease progression. All patients were treated daily with coated aspirin (325 mg) for DVT prophylaxis. One patient developed DVT/PE. Five patients stopped therapy for disease progression and 11 stopped for significant toxicity (protracted > 30 days peripheral neuropathy grade 3 (n = 2), VZV/PCP/viral pneumonia (n = 3), protracted neutropenia (n = 3), MDS 5q (n = 1), cellulitis (n = 1), and leukocytosis vasculitis (n = 1)). Peripheral neuropathy and neutropenia were most common non-infectious toxicities. As of 9/2010, all patients remain alive and twenty patients (65%) remain alive without disease progression; with median follow-up of 33 months (range 20-45) from transplant. In summary, BIRD can be given post ASCT. Peripheral neuropathy and neutropenia are most common non-infectious toxicities. With median follow-up of 33 months, all patients remain alive and 65% remain alive without...