Purpose: We evaluated outcomes for pediatric patients who underwent autologous hematopoietic stem-cell transplantation (AHSC) for refractory or recurrent Hodgkin Disease (HD) to identify factors that contribute to the success or failure of their treatment.

Patients and Methods: From 1988 to 2012, 89 patients <21 years with relapsed or refractory HD underwent high-dose therapy followed by AHSC according to one of several autologous transplantation protocols at Stanford University Medical Center (Stanford, CA). Pretreatment factors were analyzed by univariate and multivariate analysis for prognostic significance for 5-year overall survival (5 yr OS).

Results: The majority of the patients received a BCNU, etoposide, and cyclophosphamide conditioning regimen. The 5 yr OS in these patients was greater than that of recipients of either other chemotherapy-only preparative (e.g. CCNU, etoposide, cyclophosphamide or gemcitabine, vinorelbine, etoposide, cyclophosphamide) or radiation-containing regimens (75%, 61%, 50% respectively; P = .0057). AHSC at or before second relapse resulted in better 5 yr OS than AHSC later in the disease course (73% v 51%, P = .4). Patients who underwent AHSC in 2002 or later had significantly better OS than those who underwent transplantation between 1988 and 2001 (80% v 65%; P = .07). Those in the earlier era were almost twice as likely to die within 5 years (risk ratio 1.97). This improvement in outcome is present even among patients who received BCNU containing conditioning (82% 5 yr OS 2002-2012 vs. 71% 5 yr OS 1988-2001, P = .21, risk ratio 1.89). 5 yr OS correlated most strongly with the era of transplantation. Most of the difference in outcome was attributable to decreased mortality in the peri-transplant period.

Conclusion: Approximately three-fourths of children who underwent AHSC for their recurrent or refractory HD can be successfully treated with current therapy, confirming the continued efficacy of this approach. Analyses of results by treatment era suggest that supportive care during the peri-transplant period has improved outcomes. The BCNU, etoposide, and cyclophosphamide regimen was at least as effective as BEAM, and had greater OS than many published reports about outcomes using BEAM. Since outcome was related to disease status, pediatric patients should undergo AHSC prior to second relapse.

Donor Lymphocyte Infusions in Pediatric Patients with Malignant and Non-Malignant Diseases After Allogeneic Bone Marrow Transplantation: A Single Center Experience

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Donor lymphocyte infusions (DLI) are used after allogeneic bone marrow transplantation (allo BMT) to treat and prevent relapse in patients with leukemia, to prevent graft rejection for non-malignant diseases, and to treat post-transplant lymphoproliferative disorder or viral infections. The data in children, particularly in non-malignant diseases, are limited and based on case reports and small series. We describe our experience in using DLI in pediatric patients with both malignant and non-malignant diseases after allo BMT over a 3-year period.

From November 2009 to October 2012, 11 pediatric patients, median age 9.5 years (range, 1.5-18.5 years), were treated with 22 doses of DLI. Median follow-up duration after DLI was 7 months (range, 2-32 months).

Six patients had hematological malignancies (3 - acute lymphoblastic leukemia, 2 - acute myeloid leukemia, 1 - chronic myeloid leukemia (CML)). DLI was given after salvage chemotherapy (5 children) to treat relapse and achieve remission status or to prevent relapse without previous chemotherapy (1 patient). Median time between BMT and DLI was 7 months (range, 4-18 months). Median CD3-T-cell dose of DLI in patients with acute leukemia was 5x10^7/kg (range, 1-10); a child with CML received 5 DLIs in escalating cell doses. Four of six patients had DLI from matched unrelated donors, and developed severe multisystemic graft versus host disease (GVHD).

Five children with non-malignant diseases (2 - thalassemia major, 2 - metabolic diseases, 1 - Immunodeficiency) had progressively decreasing chimerism and received DLI to prevent graft rejection. DLI was given 8 months (median; range, 2-9 months) after BMT. Median dose was 1x10^7/kg (range, 0.1-5). All patients had matched family donors (MFD). In 4/5 children, DLI prevented full rejection. In 2/5 children, stable mixed chimerism (25-35%) was enough to induce full remission of their basic disease. All were alive at the end of follow-up; none had GVHD.

Based on this experience, DLI achieved an excellent response for the patient with CML; but was not effective for treatment of full relapse in children with acute leukemia, and resulted in a high incidence of severe multisystemic GVHD. DLI could be an effective and safe method to prevent graft failure in children with non-malignant diseases after MFD. The absence of GVHD in this group is most likely due to family donors and reduced cell dose. Prospective studies of DLI in children are needed.

Bone Marrow Failure: Congenital Amegakaryocytic Thrombocytopenia - A Case Report of Successful Matched Unrelated Bone Marrow Transplantation in Pediatric Twins

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Congenital Amegakaryocytic Thrombocytopenia (CAMT) is a rare inherited autosomal recessive bone marrow failure disorder that presents with thrombocytopenia and absence of megakaryocytes. Bleeding/bruising is typically recognized on day 1 of life or at least within the first month, with risk of life threatening hemorrhage, requiring platelet transfusions.