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Efficacy of donor lymphocyte infusions following allogenic stem cell transplantation (allo-HSCT)

Olga A. Slesarchuk, Elena V. Babenko, Maria A. Estrina, Ilya V. Kazantsev, Ludmila S. Zubarovskaya, Boris V. Afanasyev

Memorial R.M. Gorbacheva Institute of Children Hematology and Transplantation, St. Petersburg
Pavlov State Medical University, St. Petersburg, Russia

Correspondence: Olga A. Slesarchuk, Memorial R.M. Gorbacheva Institute of Children Hematology and Transplantation, St. Petersburg Pavlov State Medical University, 6/8, Tolstoy str., St. Petersburg, 199044, Russia, E-mail: cadet2002@wmail.ru

Abstract

Purpose: To evaluate the efficacy of donor lymphocyte infusion (DLI) after allo-HSCT in patients (pts) with acute leukemia.

Patients and Methods: Data from 29 pts given allo-HSCT from HLA-matched related donors (n=12), unrelated donors (n=11), and from haploidentical family member donors (n=6) were retrospectively analyzed. The conditioning regimen was myeloablative in 13 patients and RIC in 16 patients. Underlying malignant diseases were acute myeloid leukemia (AML, n=14) and acute lymphoblastic leukemia (ALL, n=15). The indications for DLI were minimal residual disease (n=2), mixed chimerism (n=3), preemptive treatment (n=1), graft rejection (n=1), and disease relapse (n=22). Fifteen pts with disease relapse received cytoreductive chemotherapy before DLI and 7 pts received DLI alone. The total number of DLI procedures was 56. Cell dose ranged from $3x10^4$ CD3+cells/kg to $1x10^8$ CD3+cells/kg. Fifteen pts received DLI as a bulk dose regimen, 16 pts received an escalating dose regimen. At the moment of DLI all pts had no signs of aGVHD; however, 5 pts had cGVHD.

Results: Complete remission (CR) was obtained in 12 pts (41%): 4 (27%) of 15 pts with ALL and 8 (57%) of 14 pts with AML. GVHD grade I–II appeared in 2 (6.8%) pts, grade III–IV in 3 (10%) pts, and in 2 cases it was fatal. Seven pts relapsed after DLI. The duration of CR after DLI ranged from 2 to 11 months. Five pts (17%) after allo-HSCT and DLI are still alive and in CR. Although response rate was greater in AML then in ALL, the 3yr OS was similar for both groups: 5 (36%) and 6 (44%), respectively.

Table 1.

Diagnosis	N	Indications	Treatment	N	CR	Response	3 yr OS
ALL	15	Relapse	DLI+chemotherapy	10	3	4(27%)	44%
			DLI	1	0		
		MRD	DLI	2	1		
		Mixed chimerism	DLI	1	0		
		Graft rejection	DLI	1	0		
AML	14	Relapse	DLI+chemotherapy	5	3	8(57%)	36%
			DLI	6	3		
		Mixed chimerism	DLI	2	2		
		Preemptive	DLI	1	0		

Conclusions: Using DLI is effective in pts with disease relapse after allo-HSCT. However, it is associated with a high risk of aGVHD. Strategies to use a combination of DLI with target agents for efficacy improvement should be investigated in patients after allo-HSCT.

Keywords: relapse post-HSCT, donor lymphocyte infusion, response, GVHD, cell dose