Post-transplant cyclophosphamide *versus* anti-thymocyte globulin for graft-*versus*-host disease prevention in haploidentical transplantation for adult acute lymphoblastic leukemia

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Variables	Acute GVHD II-IV	Acute GVHD III-IV	Chronic GVHD	Extensive cGVHD	Relapse	NRM	LFS	OS	GRFS
Age <median	33.9%[27.5-40.4]	16.9%[12.2-22.3]	33.6%[26.3-41.1]	11.4%[7-16.9]	38.8%[31.5-46]	23.6%[18-29.7]	37.6%[30.4-44.8]	43.8%[36.3-51.3]	30%[23.1-36.9]
Age >median	28.2%[22.2-34.5]	10.2%[6.5-14.8]	28.4%[21.8-35.2]	10.9%[6.6-16.2]	32.8%[25.9-39.9]	32.6%[25.9-39.5]	34.5%[27.2-41.8]	42.9%[35.2-50.5]	28.4%[21.5-35.3]
P-value	0.16	0.043	0.32	0.86	0.11	0.06	0.94	0.69	0.61
Year of HCT <median	32.3%[26-38.7]	14.7%[10.2-19.9]	32.7%[26.1-39.4]	10.7%[6.8-15.5]	38.9%[32.2-45.6]	29.1%[23-35.5]	32%[25.5-38.4]	38.2%[31.4-44.9]	25.9%[19.8-32]
Year of HCT >median	29.9%[23.8-36.2]	12.5%[8.4-17.4]	27.7%[20.5-35.3]	12.8%[7.3-19.9]	32.5%[24.7-40.6]	27%[20.6-33.8]	40.4%[32-48.8]	50%[41.5-58.5]	31.3%[23-39.5]
P-value	0.35	0.46	0.28	0.96	0.06	0.48	0.01	0.008	0.007
CR1	31.4%[25.1-37.9]	12.4%[8.3-17.4]	36.2%[28.6-43.7]	12.3%[7.6-18.2]	22.6%[16.4-29.4]	26.2%[19.8-33.1]	51.2%[43.3-59.1]	56.4%[48.3-64.4]	41.3%[33.7-49]
CR2+	31.1%[23.2-39.2]	12.4%[7.4-18.8]	31.2%[22.6-40.1]	11%[5.9-17.9]	37.2%[28.4-46.1]	30.1%[22.4-38.2]	32.6%[24-41.3]	41.6%[32.5-50.8]	25.6%[17.4-33.8]
Advanced	30.2%[20.6-40.3]	18.1%[10.6-27.1]	17.9%[9.7-28.2]	8.4%[3.3-16.5]	63.8%[51.6-73.7]	30%[20.2-40.3]	6.2%[0.5-12]	15.8%[7.4-24.1]	6.7%[0.7-12.7]
P-value	0.998	0.36	0.03	0.51	<0.0001	0.51	<0.0001	<0.0001	<0.0001
Ph(-) B-ALL	33.4%[25.9-41.1]	14.3%[9.2-20.5]	35.1%[26.4-44]	12.2%[6.7-19.5]	37.6%[28.6-46.6]	23.5%[16.8-30.7]	38.9%[29.8-48]	45.4%[36.2-54.7]	27.6%[19-36.1]
Ph(+) B-ALL	35.3%[27.1-43.5]	12.9%[7.8-19.2]	34.2%[25.1-43.5]	13.9%[8.1-21.1]	24.5%[16.9-32.9]	35.8%[27.1-44.5]	39.7%[30.4-48.9]	47.7%[38.3-57.2]	34.6%[25.7-43.5]
T-ALL	24.5%[17.6-32]	13.4%[8.3-19.7]	24%[16.5-32.3]	7.8%[3.8-13.7]	45.1%[36-53.8]	25.2%[18-33]	29.7%[21.4-38]	37.6%[28.7-46.5]	25.3%[17.4-33.2]
P-value	0.09	0.93	0.3	0.32	0.003	0.25	0.21	0.50	0.3
KPS <90	28.9%[20.6-37.7]	14.8%[8.9-22.2]	28.4%[19.7-37.8]	10.4%[5.3-17.5]	32.7%[23.5-42.2]	40.7%[31-50.2]	26.5%[17.4-35.6]	29.8%[20.2-39.5]	23.9%[15.2-32.6]
KPS ≥90	32.1%[26.7-37.6]	13.2%[9.5-17.4]	29.9%[23.9-36.1]	11.1%[7.3-15.7]	37%[30.8-43.3]	24%[18.9-29.4]	39%[32.5-45.4]	48.5%[41.9-55.1]	30.4%[24.3-36.5]
P-value	0.5	0.68	0.8	0.81	0.79	0.0004	0.0004	<0.0001	0.007
BM	27%[21-33.4]	12.2%[8.1-17.2]	29.3%[22.4-36.5]	11.5%[7.1-17.1]	37.4%[30.2-44.7]	25.9%[19.8-32.5]	36.6%[29.3-44]	46.1%[38.5-53.7]	30.5%[23.4-37.5]
PB	34.7%[28.4-41.1]	14.8%[10.4-19.8]	32.5%[25.6-39.6]	10.8%[6.6-16.1]	34.4%[27.4-41.5]	30.4%[24.1-36.9]	35.2%[28-42.4]	40.7%[33.3-48.2]	27.9%[21.1-34.7]
P-value	0.05	0.42	0.25	0.93	0.65	0.23	0.53	0.28	0.23
MAC	34.1%[28.9-39.4]	16.2%[12.4-20.5]	34.3%[28.4-40.3]	12.5%[8.7-17.1]	37.3%[31.4-43.2]	26.7%[21.7-31.9]	36%[30-41.9]	44.8%[38.6-51]	28.5%[22.8-34.1]
RIC	21.3%[13.8-29.9]	5.1%[1.9-10.7]	20.8%[12.9-30]	6.7%[2.7-13.2]	31.4%[22-41.1]	32.8%[23.3-42.6]	35.9%[25.7-46.1]	38.6%[28.1-49.2]	31.2%[21.5-41]
P-value	0.005	0.004	0.07	0.27	0.53	0.25	0.53	0.45	0.98

Male recipient	33.2%[27.6-39]	16.8%[12.5-21.5]	33.2%[26.9-39.7]	12.4%[8.3-17.3]	36.1%[29.8-42.5]	28.3%[22.7-34]	35.6%[29.2-42]	43.7%[37-50.3]	26.7%[20.7-32.7]
Female recipient	26.9%[20-34.3]	7.4%[3.9-12.3]	25.9%[18.4-33.9]	8.1%[4.1-13.9]	35.2%[26.9-43.5]	27.7%[20.3-35.5]	37.2%[28.5-45.8]	43.7%[34.7-52.7]	34.1%[25.7-42.5]
P-value	0.10	0.006	0.19	0.37	0.91	0.72	0.66	0.73	0.18
Male donor	28%[22.2-34]	13.5%[9.4-18.3]	23.9%[17.9-30.4]	7.6%[4.3-12]	34.9%[28.2-41.7]	30.5%[24.2-36.9]	34.6%[27.7-41.5]	38.4%[31.2-45.5]	28.7%[22.1-35.2]
Female donor	34.6%[27.9-41.4]	13.6%[9.2-18.9]	39%[31.1-46.8]	15.5%[10-22]	37%[29.4-44.6]	25.5%[19.3-32.2]	37.4%[29.7-45.2]	49.1%[41.2-57.1]	29.7%[22.3-37]
P-value	0.09	0.97	0.007	0.03	0.95	0.15	0.16	0.049	0.46
No Female (D) → Male (R)	29.5%[24.4-34.8]	12.3%[8.9-16.4]	27.1%[21.6-32.8]	8.7%[5.6-12.8]	35.1%[29.2-41.1]	29.1%[23.8-34.7]	35.7%[29.6-41.8]	40.7%[34.3-47.1]	29.7%[23.8-35.5]
Female (D) → male (R)	34.5%[26.1-43.1]	16%[10-23.1]	38.5%[28.6-48.3]	16.1%[9.4-24.5]	37%[27.5-46.6]	25.5%[17.8-33.9]	37.5%[27.8-47.1]	50.6%[40.8-60.4]	28.6%[19.6-37.7]
P-value	0.18	0.31	0.07	0.07	0.93	0.46	0.58	0.31	0.95
Recipient CMV (-)	25.7%[17.2-35.2]	8.9%[4.1-15.9]	42.2%[30.4-53.5]	7.7%[3.1-15.1]	32%[21.5-42.9]	23.9%[14.9-34]	44.1%[32.3-55.9]	54.4%[43-65.8]	38.8%[27.6-50]
Recipient CMV (+)	32.4%[27.3-37.6]	14.8%[11.1-18.9]	28%[22.6-33.6]	11.7%[8.1-16.1]	37.4%[31.6-43.2]	28.6%[23.6-33.9]	34%[28.2-39.7]	40.8%[34.8-46.9]	26.7%[21.2-32.1]
P-value	0.2	0.16	0.03	0.39	0.45	0.59	0.22	0.15	0.15
Donor CMV (-)	23.9%[16.4-32.4]	10%[5.3-16.4]	31.2%[21.7-41.2]	8%[3.4-15.1]	35.1%[25.4-44.8]	21.7%[14-30.5]	43.3%[32.9-53.6]	50.2%[39.7-60.8]	37.7%[27.7-47.7]
Donor CMV (+)	34.1%[28.7-39.5]	15%[11.2-19.3]	31.4%[25.6-37.4]	12.2%[8.4-16.8]	36.1%[30.1-42.1]	29.9%[24.6-35.4]	34%[28-40]	41.9%[35.6-48.1]	26.6%[20.9-32.2]
P-value	0.03	0.21	0.95	0.41	0.93	0.13	0.21	0.14	0.14

Supplemental Table 1. Univariate analysis of post-transplant outcomes after haploidentical transplantation in ALL patients

Abbreviations: GVHD – graft-versus-host disease; NRM – non-relapse mortality; LFS – leukemia-free survival; OS – overall survival; GRFS – GVHD/relapse-free survival; HCT – hematopoietic cell transplantation; CR – complete remission; ALL – acute lymphoblastic leukemia; KPS – Karnofsky performance score; BM – bone marrow; PB – peripheral blood; MAC – myeloablative conditioning; RIC – reduced intensity conditioning; D – donor; R – recipient; CMV – cytomegalovirus

Supplemental Table 2. Subset analysis of post-transplant outcomes by graft source (Bone marrow vs. peripheral blood)

		100-day Acute GVHD II-IV	2-year Chronic GVHD	2-year Relapse	2-year NRM	2-year LFS	2-year OS	2-year GRFS
Bone Marrow	ATG (n=31)	35.5%[19.1-52.3]	26.7%[11-45.3]	55.4%[34.6-71.9]	20.4%[7.9-37]	24.2%[8-40.3]	34.8%[17.1-52.5]	20.6%[5.2-36]
	PTCy (n=175)	25.4%[19-32.3]	29.6%[22.1-37.6]	33.7%[26.1-41.5]	26.9%[20.1-34.1]	39.4%[31.2-47.6]	48.6%[40.3-57]	32.7%[24.9-40.5]
	P-value	0.17	0.52	**0.06**	0.41	0.41	0.30	0.75
Peripheral Blood	ATG (n=67)	31.4%[20.3-43]	28.3%[15.9-42]	35.7%[23-48.6]	39.7%[26.5-52.6]	24.6%[12.4-36.8]	23.3%[11.4-35.3]	20.8%[9.3-32.4]
	PTCy (n=161)	36%[28.5-43.6]	34.1%[25.9-42.4]	34%[25.6-42.5]	26.5%[19.6-34]	39.5%[30.7-48.3]	48.4%[39.4-57.3]	30.8%[22.5-39.1]
	P-value	0.82	0.77	0.52	**0.06**	0.008	0.001	0.03

Abbreviations: GVHD – graft-versus-host disease; NRM – non-relpase mortality; LFS – leukemia-free survival; OS – overall survival; GRFS – GVHD-free/relapse-free survival; ATG – anti-thymocyte globulin; PTCy – post-transplant cyclophosphamide

Supplemental Table 3. Subset analysis of post-transplant outcomes by ATG dose in available subjects (N=81), stratified by < or ≥ to median dose of 20 mg/Kg.

ATG dose (N=81)	100-day Acute GVHD II-IV	2-year Chronic GVHD	2-year Relapse	2-year NRM	2-year LFS	2-year OS	2-year GRFS
<20 mg/Kg	53.4% [33.5-69.8]	26.3% [9.8-46.4]	51.2% [25.3-72.1]	26% [10.9-44.1]	22.9% [2.7-43]	25.9% [5.7-46.2]	19.9% [0-40.3]
≥20 mg/Kg	23.3% [11.9-36.8]	22.5% [10.8-36.7]	44.6% [29-59]	35.3% [21.1-49.8]	20.2% [8-32.4]	24.8% [11.7-37.9]	18.1% [6.4-29.8]
P-value	**0.007**	0.68	0.95	0.67	0.54	0.78	0.40

Abbreviations: GVHD – graft-versus-host disease; NRM – non-relpase mortality; LFS – leukemia-free survival; OS – overall survival; GRFS – GVHD-free/relapse-free survival; ATG – anti-thymocyte globulin