

Donor cytomegalovirus serology impacts overall survival in children receiving first unrelated hematopoietic stem cell transplant for acute leukemia: European Society of Bone Marrow Transplantation Pediatric Diseases Working Party Study

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Supplement Table 1. Patient, disease and transplant characteristics

Variables	All patients	CMV Seropositive Patients			CMV Seronegative Patients		
	n=1640	R+/D- (n=394)	R+/D+ (n=515)	p-value	R-/D- (n=533)	R-/D+ (n=198)	p-value
Year of transplant	2017	2017	2018		2016	2016	
Median (range)	(2005-2021)	(2006-2021)	(2005-2021)	0.004	(2005-2021)	(2005-2021)	0.61
Patient age Median (range)	8.9 (0.3-18)	8.7 (0.5-18)	8.3 (0.3-18)	0.35	9.3 (0.4-18)	9.8 (0.5-17.9)	0.79
Donor age Median (range)	28 (18-57.4)	28 (18-57.4)	28.8 (18.6-54.9)	0.49	27 (18-53.3)	31.6 (18.2-54.4)	< 0.001
Source of cells							
BM	1022 (62.3)	241 (61.2)	274 (53.2)	0.02	388 (72.8)	119 (60.1)	< 0.001
PB	618 (37.7)	153 (38.8)	241 (46.8)		145 (27.2)	79 (39.9)	
Patient sex							
Female	640 (39)	143 (36.3)	211 (41)	0.15	204 (38.3)	82 (41.4)	0.44
Male	1000 (61)	251 (63.7)	304 (59)		329 (61.7)	116 (58.6)	
Donor sex							
Female	558 (34.1)	134 (34)	188 (36.6)	0.41	172 (32.3)	64 (32.3)	0.99
Male	1080 (65.9)	260 (66)	325 (63.4)		361 (67.7)	134 (67.7)	
Missing	2	0	2		0	0	
Female to Male							
No	1335 (81.4)	308 (78.2)	419 (81.4)	0.23	444 (83.3)	164 (82.8)	0.88
Yes	305 (18.6)	86 (21.8)	96 (18.6)		89 (16.7)	34 (17.2)	
Underlying Disease							
ALL	1071 (65.3)	247 (62.7)	348 (67.6)	0.13	348 (65.3)	128 (64.6)	0.87
AML	569 (34.7)	147 (37.3)	167 (32.4)		185 (34.7)	70 (35.4)	
DRI							
Low/Int	798 (48.7)	190 (48.2)	253 (49.1)	0.79	265 (49.7)	90 (45.5)	0.31
High/Very High	842 (51.3)	204 (51.8)	262 (50.9)		268 (50.3)	108 (54.5)	
MAC							
No	60 (3.7)	12 (3)	29 (5.6)	0.06	14 (2.6)	5 (2.5)	0.94
Yes	1580 (96.3)	382 (97)	486 (94.4)		519 (97.4)	193 (97.5)	
TBI							
No	909 (55.4)	229 (58.1)	303 (58.8)	0.83	271 (50.8)	106 (53.5)	0.52
Yes	731 (44.6)	165 (41.9)	212 (41.2)		262 (49.2)	92 (46.5)	
GVHD prevention							
CSA+MTX	1165 (71)	294 (74.6)	410 (79.6)	0.21	320 (60)	141 (71.2)	0.01 f
CSA	271 (16.5)	51 (12.9)	44 (8.5)		144 (27)	32 (16.2)	
CSA + Other	74 (4.5)	12 (3)	19 (3.7)		33 (6.2)	10 (5.1)	
CSA+MTX+other	31 (1.9)	7 (1.8)	6 (1.2)		15 (2.8)	3 (1.5)	
Other nonCSA	9 (6)	30 (7.6)	36 (7)		21 (3.9)	12 (6.1)	

Shown are numbers of patients (%) except ones indicated as median (Range) R+: CMV seropositive patient; R-: CMV-seronegative patient; D+: CMV-seropositive donor; D-: CMV-seronegative donor; BM: Bone Marrow; PB: Peripheral Blood; ALL: Acute Lymphoblastic Leukemia; AML: Acute Myeloid Leukemia; DRI: Disease Risk Index; Int: Intermediate; MAC: Myeloablative conditioning; TBI: Total Body Irradiation; GVHD: Graft versus Host Disease; CSA: Cyclosporine; MTX: Methotrexate; f: Exact Fisher test

Supplement Table 2. Association of CMV serostatus with OS, LFS, RI, NRM, Myeloid Recovery, aGVHD, cGVHD and GRFS in different HLA and patient CMV serology group

	All Patients	CMV Seropositive Patients		CMV Seronegative Patients	
Outcomes	N=1640	R+/D- (N=394)	R+/D+ (N=515)	R-/D- (N=533)	R-/D+ (N=198)
F/U (yrs) Median (95%CI)	3.6 (3.4 - 3.9)	3.5 (3.1 - 4)	2.9 (2.6 - 3.1)	4.4 (4 - 4.8)	4 (3.2 - 4.7)
OS (2 yrs)	74.8 (72.9 - 76.6)	69.1 (64.1 - 73.6)	78.7 (74.6 - 82.2)	78.7 (74.8 - 82.1)	75.6 (68.7 - 81.2)
LFS (2 yrs)	66.8 (64.7 - 68.8)	63.3 (58.1 - 68)	69.5 (65.1 - 73.5)	69.9 (65.7 - 73.8)	65.2 (57.8 - 71.6)
RI (2 yrs)	23.3 (21.5 - 25.1)	23.9 (19.6 - 28.3)	23.3 (19.5 - 27.3)	23.6 (19.9 - 27.4)	24.3 (18.3 - 30.7)
NRM (2 yrs)	9.9 (8.7 - 11.3)	12.9 (9.7 - 16.4)	7.2 (5.1 - 9.7)	6.5 (4.6 - 8.9)	10.5 (6.7 - 15.4)
Myeloid recovery (30 d)	89.8 (88.5 - 91)	89.2 (85.7 - 92)	92.1 (89.3 - 94.2)	90.5 (87.6 - 92.7)	90.1 (84.8 - 93.6)
Myeloid recovery (60 d)	97.6 (96.8 - 98.2)	97.9 (95.8 - 99)	98.1 (96.4 - 99)	99 (97.6 - 99.6)	96.9 (93 - 98.6)
aGVHD-II/IV (100 d)	33.8 (31.8 - 35.8)	33.3 (28.7 - 38.1)	32 (27.9 - 36.2)	27.8 (24 - 31.7)	36.1 (29.4 - 42.8)
aGVHD-III/IV (100 d)	11 (9.8 - 12.4)	9.9 (7.2 - 13.1)	9 (6.6 - 11.7)	7.6 (5.5 - 10.1)	12.4 (8.2 - 17.4)
GRFS (2 yrs)	54.2 (52 - 56.4)	52.5 (47.1 - 57.5)	57 (52.1 - 61.5)	58.7 (54.1 - 63.1)	49.8 (42 - 57.1)
CGVHD (2 yrs)	14.6 (13 - 16.2)	14.2 (10.7 - 18.1)	15.7 (12.3 - 19.3)	12.7 (9.7 - 16)	12.8 (8.1 - 18.6)
CGVHD Ext. (2 yrs)	5.8 (4.8 - 7)	5.3 (3.3 - 8.1)	6.5 (4.4 - 9.2)	4.4 (2.7 - 6.6)	5.6 (2.8 - 10)

F/U: follow-up; OS: Overall survival; LFS: Leukemia free survival; RI: Relapse Incidence; NRM: Non relapse mortality; aGVHD: acute graft versus host disease; GRFS: Graft versus host disease free relapse free survival; cGVHD: chronic graft versus host disease; Ext: Extensive; d: days; yrs: years

Supplement Table 3. Causes of Death

	Seropositive Patients		Seronegative Patients	
Cause of death	R+/D- (N=125)	R+/D+ (N=112)	R-/D- (N=127)	R-/D+ (N=54)
Relapse [n (%)]	75 (60)	76 (68.5)	91 (71.7)	33 (61.1)
Infections [n (%)]	25 (20)	18 (16.2)	17 (13.4)	8 (14.8)
GVHD + Infection [n (%)]	5 (4)	6 (5.4)	3 (2.4)	1 (1.9)
GVHD [n (%)]	6 (4.8)	2 (1.8)	5 (3.9)	2 (3.7)
Other transplant related [n (%)]	14 (11.2)	9 (8.1)	11 (8.7)	10 (18.5)
Missing	0	1	0	0

R+: CMV seropositive patient; R-: CMV-seronegative patient; D+: CMV-seropositive donor; D-: CMV-seronegative donor; GVHD: Graft versus Host Disease