

Age-related differences in donor selection priorities for allogeneic hematopoietic transplantation

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Supplementary Table S1. Results of the multivariate analyses of overall survival, disease-free survival, non-relapse mortality, and relapse in all patients

| | OS* | | DFS† | | NRM‡ | | Relapse† | |
|---------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|
| | HR (95% CI) | p value | HR (95% CI) | p value | HR (95% CI) | p value | HR (95% CI) | p value |
| M-RD | 1.00 | Reference | 1.00 | Reference | 1.00 | Reference | 1.00 | Reference |
| 1MM-RD | 1.26 (1.12-1.41) | 0.00012 | 1.11 (0.99-1.25) | 0.069 | 1.93 (1.61-2.31) | <0.0001 | 0.72 (0.61-0.84) | <0.0001 |
| 23MM-RD | 1.46 (1.33-1.62) | <0.0001 | 1.23 (1.11-1.37) | 0.00012 | 2.15 (1.82-2.54) | <0.0001 | 0.77 (0.67-0.89) | 0.00040 |
| M-UD | 0.94 (0.88-1.01) | 0.093 | 0.89 (0.84-0.95) | 0.00037 | 1.27 (1.13-1.43) | <0.0001 | 0.77 (0.71-0.84) | <0.0001 |
| 1MM-UD | 1.12 (1.04-1.20) | 0.0032 | 1.02 (0.95-1.10) | 0.58 | 1.68 (1.48-1.90) | <0.0001 | 0.72 (0.65-0.79) | <0.0001 |
| U-CB | 1.19 (1.12-1.26) | <0.0001 | 1.08 (1.02-1.14) | 0.011 | 1.70 (1.54-1.88) | <0.0001 | 0.76 (0.71-0.82) | <0.0001 |

Abbreviations: OS, overall survival; DFS, disease-free survival; NRM, non-relapse mortality; HR, hazard ratio; CI, confidence interval

* Adjusted for other significant variables including recipient age, recipient sex, disease, disease risk, ECOG PS, conditioning regimen, and year of transplantation

†Adjusted for other significant variables including recipient age, recipient sex, disease, disease risk, ECOG PS, conditioning regimen, use of *in vivo* T-cell depletion, and year of transplantation

‡Adjusted for other significant variables including recipient age, recipient sex, disease, disease risk, ECOG PS, conditioning regimen, GVHD prophylaxis, use of *in vivo* T-cell depletion, and year of transplantation

Supplementary Table S2. Results of multivariate analyses of acute and chronic graft-versus-host disease in all patients

| | Grade II-IV acute GVHD ^a | | Grade III-IV acute GVHD ^b | | Chronic GVHD ^c | | Extensive chronic GVHD ^d | |
|---------|-------------------------------------|-----------|--------------------------------------|-----------|---------------------------|-----------|-------------------------------------|-----------|
| | HR (95% CI) | p value | HR (95% CI) | p value | HR (95% CI) | p value | HR (95% CI) | p value |
| M-RD | 1.00 | Reference | 1.00 | Reference | 1.00 | Reference | 1.00 | Reference |
| 1MM-RD | 1.35 (1.17-1.56) | <0.0001 | 1.59 (1.26-2.00) | 0.00011 | 0.97 (0.82-1.14) | 0.84 | 1.00 (0.82-1.22) | 1.00 |
| 23MM-RD | 1.17 (1.03-1.33) | 0.016 | 1.74 (1.42-2.12) | <0.0001 | 0.71 (0.60-0.84) | <0.0001 | 0.66 (0.53-0.82) | 0.00020 |
| M-UD | 1.09 (1.01-1.18) | 0.022 | 0.91 (0.78-1.06) | 0.24 | 0.85 (0.78-0.93) | 0.00025 | 0.82 (0.73-0.92) | 0.00077 |
| 1MM-UD | 1.43 (1.32-1.55) | <0.0001 | 1.34 (1.14-1.58) | 0.00038 | 0.91 (0.83-1.01) | 0.070 | 0.87 (0.76-0.99) | 0.033 |
| U-CB | 1.14 (1.06-1.22) | 0.00022 | 0.98 (0.86-1.12) | 0.79 | 0.64 (0.59-0.69) | <0.0001 | 0.43 (0.38-0.49) | <0.0001 |

Abbreviations: GVHD, graft-versus-host disease; HR, hazard ratio; CI, confidence interval; ECOG PS, Eastern Cooperative Oncology Group performance status; GVHD, graft-versus-host disease.

^aAdjusted for other significant variables including recipient age, disease, disease risk, ECOG PS, and conditioning regimen.

^bAdjusted for other significant variables including recipient age, recipient sex, disease, disease risk, GVHD prophylaxis, and use of *in vivo* T-cell depletion.

^cAdjusted for other significant variables including recipient age, recipient sex, disease, disease risk, conditioning regimen, GVHD prophylaxis, use of *in vivo* T-cell depletion, and year of transplantation.

^dAdjusted for other significant variables including recipient age, recipient sex, disease, disease risk, conditioning regimen, GVHD prophylaxis, and year of transplantation.

Supplementary Table S3. Interaction test for overall survival, disease-free survival, non-relapse mortality, and relapse between age and donor type

| | OS | | DFS | | NRM | | Relapse | |
|-----------------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|
| | HR (95% CI) | p value | HR (95% CI) | p value | HR (95% CI) | p value | HR (95% CI) | p value |
| Age50 * 1MM-RD | 1.02 (0.80-1.29) | 0.89 | 1.11 (0.88-1.40) | 0.39 | 0.86 (0.61-1.22) | 0.41 | 1.01 (0.73-1.38) | 0.97 |
| Age50 * 23MM-RD | 0.89 (0.73-1.08) | 0.24 | 0.92 (0.76-1.11) | 0.39 | 0.67 (0.50-0.91) | 0.0094 | 1.01 (0.79-1.29) | 0.93 |
| Age50 * M-UD | 0.88 (0.76-1.00) | 0.055 | 0.88 (0.78-1.01) | 0.063 | 0.78 (0.63-0.96) | 0.019 | 0.95 (0.80-1.12) | 0.50 |
| Age50 * 1MM-UD | 0.92 (0.79-1.08) | 0.31 | 0.98 (0.85-1.13) | 0.76 | 0.80 (0.64-1.00) | 0.047 | 1.03 (0.85-1.25) | 0.79 |
| Age50 * U-CBT | 0.92 (0.82-1.04) | 0.20 | 0.94 (0.84-1.05) | 0.26 | 0.88 (0.73-1.06) | 0.18 | 0.85 (0.74-0.99) | 0.031 |

Abbreviations: OS, overall survival; DFS, disease-free survival; NRM, non-relapse mortality; HR, hazard ratio; CI, confidence interval.

Supplementary Table S4. Interaction test for overall survival between age and donor type, classified the M-UD and 1MM-UD groups according to donor age.

| | HR (95% CI) | p value |
|------------------|------------------|---------|
| Age50 * 1MM-RD | 1.06 (0.84-1.34) | 0.63 |
| Age50 * 23MM-RD | 0.89 (0.74-1.08) | 0.23 |
| Age50 * M-UD-Y | 0.86 (0.75-0.99) | 0.035 |
| Age50 * M-UD-O | 1.08 (0.74-1.56) | 0.70 |
| Age50 * 1MM-UD-Y | 0.91 (0.78-1.07) | 0.25 |
| Age50 * 1MM-UD-O | 1.04 (0.67-1.59) | 0.87 |
| Age50 * U-CBT | 0.94 (0.84-1.06) | 0.30 |

Abbreviations: OS, overall survival; HR, hazard ratio; CI, confidence interval.

Supplementary Table S5. Results of multivariate analyses of acute and chronic graft-versus-host disease, classified according to two patient age groups (<50 years or ≥50 years).

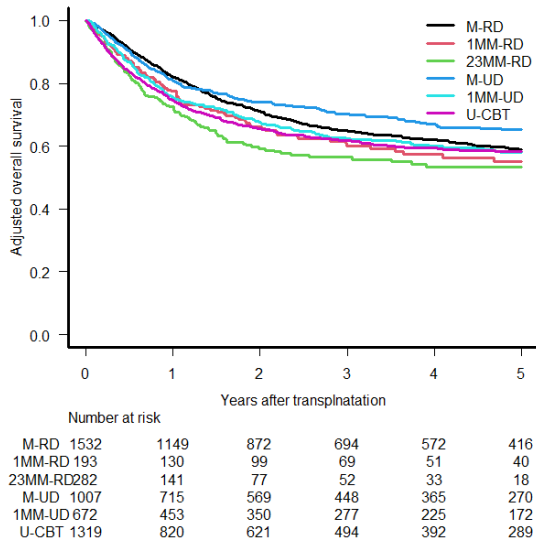
| | Grade III-IV acute GVHD ^a | | Extensive chronic GVHD ^a | |
|-------------------------|--------------------------------------|-----------|-------------------------------------|-----------|
| | HR (95% CI) | p value | HR (95% CI) | p value |
| Age <50 years | | | | |
| M-RD | 1.00 | Reference | 1.00 | Reference |
| 1MM-RD | 1.58 (1.12-2.24) | 0.0095 | 1.29 (0.98-1.70) | 0.074 |
| 23MM-RD | 1.95 (1.47-2.59) | <0.0001 | 0.84 (0.61-1.16) | 0.29 |
| M-UD-Y | 1.07 (0.85-1.34) | 0.57 | 0.85 (0.72-0.99) | 0.042 |
| M-UD-O | 0.81 (0.42-1.55) | 0.52 | 0.76 (0.50-1.18) | 0.22 |
| 1MM-UD-Y | 1.64 (1.30-2.06) | <0.0001 | 0.95 (0.79-1.13) | 0.55 |
| 1MM-UD-O | 1.38 (0.79-2.40) | 0.26 | 1.35 (0.93-1.96) | 0.12 |
| U-CB | 0.95 (0.77-1.16) | 0.60 | 0.46 (0.39-0.54) | <0.0001 |
| Age ≥50 years | | | | |
| M-RD | 1.00 | Reference | 1.00 | Reference |
| 1MM-RD | 1.59 (1.16-2.18) | 0.0042 | 0.92 (0.67-1.26) | 0.60 |
| 23MM-RD | 1.43 (1.06-1.93) | 0.018 | 0.66 (0.45-0.92) | 0.013 |
| M-UD-Y | 0.77 (0.61-0.96) | 0.019 | 0.79 (0.67-0.93) | 0.0056 |
| M-UD-O | 1.25 (0.81-1.91) | 0.32 | 0.92 (0.66-1.29) | 0.64 |
| 1MM-UD-Y | 1.05 (0.82-1.34) | 0.69 | 0.80 (0.66-0.97) | 0.022 |
| 1MM-UD-O | 1.79 (1.06-3.04) | 0.030 | 1.22 (0.78-1.90) | 0.39 |
| U-CB | 0.99 (0.81-1.17) | 0.78 | 0.42 (0.36-0.50) | <0.0001 |

Abbreviations: GVHD, graft-versus-host disease; HR, hazard ratio; CI, confidence interval; GVHD, graft-versus-host disease.

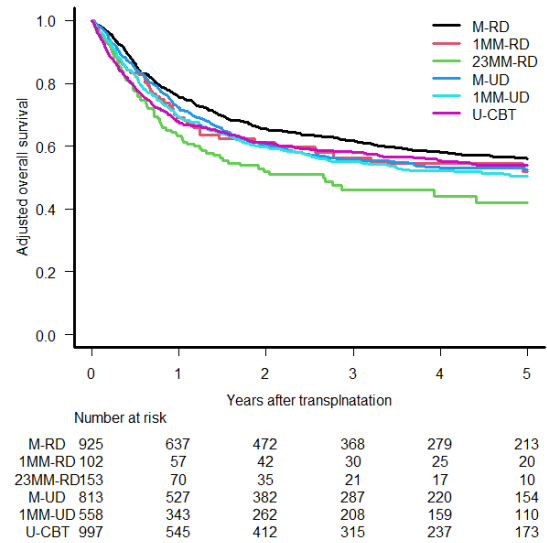
^aAdjusted for other significant variables including recipient sex, disease, disease risk, ECOG PS, conditioning regimen, GVHD prophylaxis, and use of in vivo T-cell depletion, and year of transplantation.

Supplementary Figure S1.

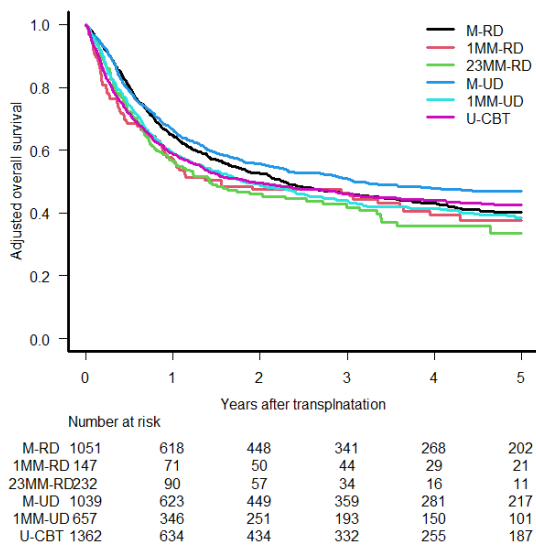
(A) Patient age: < 40 years



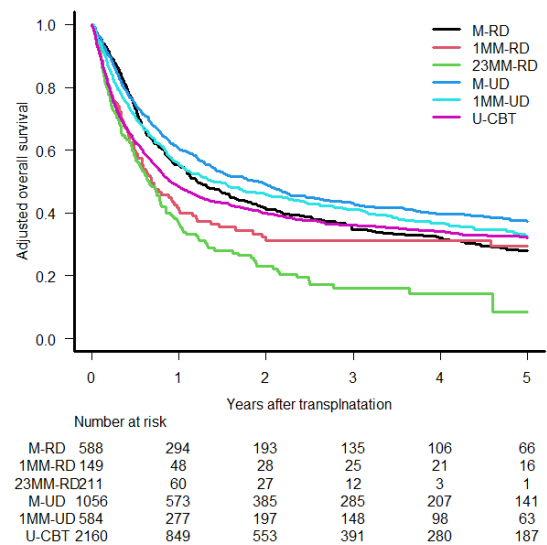
(B) Patient age: 40–49 years



(C) Patient age: 50–59 years



(D) Patient age: ≥ 60 years

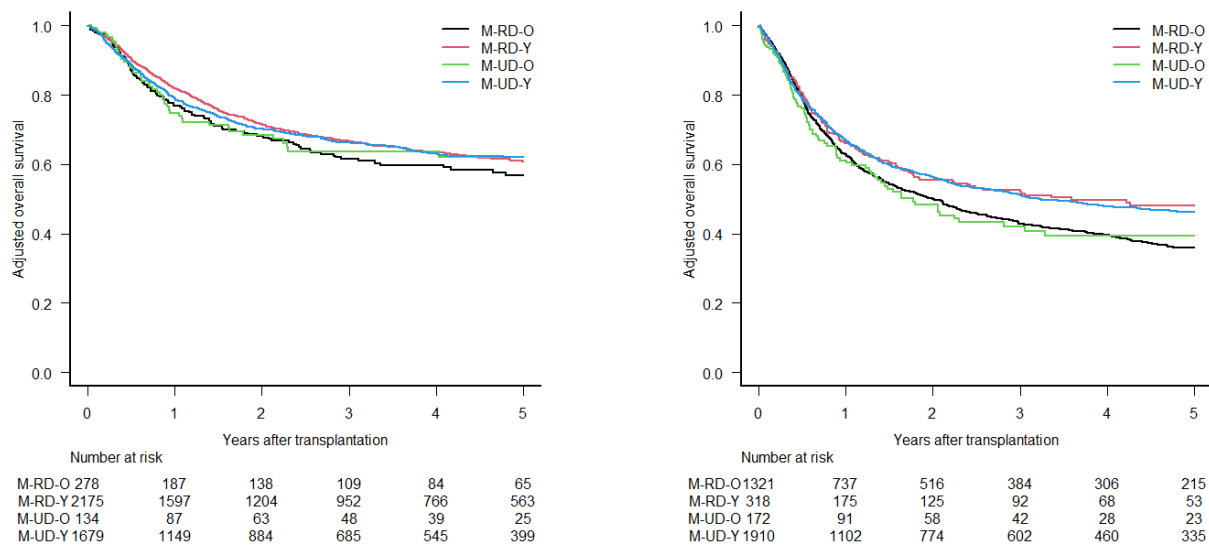


Supplementary Figure S1. Comparison of overall survival by donor source according to patient age. Overall survival by donor source stratified by patient age is shown: <40 years (A), 40–49 years (B), 50–59 years (C), and ≥60 years (D).

Supplementary Figure S2.

(A) OS: Age < 50 years

(B) OS: Age ≥ 50 years



Supplementary Figure S2. Adjusted overall survival according to patient age in related and unrelated donor groups. The adjusted probability of overall survival in the M-RD-O, M-RD-Y, M-UD-O, and M-UD-Y groups is shown, stratified by patient age: <50 years (A) and ≥50 years (B).