

Oncology, Nuclear Medicine and Transplantology (eISSN 3105-8760)



Conference Abstract A6

Allogeneic Hematopoietic Stem Cell Transplantation in Acute Myeloid Leukemia Among Elderly Patients

D.K. Zhogolev¹, S.N. Bondarenko¹, A.G. Smirnova¹, Yu.Yu. Vlasova¹, E.V. Morozova¹, I.S. Moiseev¹, A.D. Kulagin¹

¹Research Institute of Pediatric Oncology, Hematology and Transplantation named after R. M. Gorbacheva, First Saint Petersburg Medical University named after I. P. Pavlov. Saint Petersburg, Russia

Proceedings of III International Scientific and Practical Conference "Current Issues of Bone Marrow Transplantation and Hematology", October 11-12, 2025, Astana, Kazakhstan

Corresponding author's email: zhogolev.dmitry@mail.ru



This work is licensed under a Creative Commons Attribution 4.0 International License

Introduction

Allogeneic hematopoietic stem cell transplantation remains the only potentially curative approach for the majority of patients with acute myeloid leukemia, while the proportion of adverse biological variants of the disease increases with age. In recent years, advances in the optimization of transplantation techniques have expanded the upper age limit for candidates and improved survival outcomes in older patients. Against this background, it is relevant to assess the outcomes of allogeneic hematopoietic stem cell transplantation in patients aged 60 years and older compared with younger recipients.

Aim

To perform a comparative analysis of outcomes of allogeneic hematopoietic stem cell transplantation in first remission of acute myeloid leukemia between patient groups aged ≥60 years and <60 years.

Materials and Methods

This retrospective study included 379 consecutive adult patients who underwent allogeneic hematopoietic stem cell transplantation in first remission of acute myeloid leukemia at the R. M. Gorbacheva Institute from 2013 to 2024. The cohort was divided into two groups according to age (≥60 years and <60 years). The evaluated outcomes included the cumulative incidence of relapse, non-relapse mortality (nRM), overall survival (OS), and leukemia-free survival (LFS), calculated at two years of follow-up.

Results

When stratified by age, 30 patients were assigned to the \geq 60-year group and 349 to the <60-year group. Comparative analysis showed that the \geq 60-year group had a higher frequency of secondary acute myeloid leukemia (30% versus 12.6%; p = 0.03) and a statistical trend toward a higher frequency of measurable residual disease positivity (48.1% versus 28.6%; p = 0.057). The proportion of patients with a high comorbidity index was also significantly higher (50% versus 5.4%; p < 0.001). All patients aged \geq 60 years received reduced-intensity conditioning regimens, whereas 14% of patients <60 years underwent myeloablative conditioning (p = 0.02). Detailed comparative characteristics of the groups are shown in Table 1.

The cumulative incidence of relapse was 24% (95% confidence interval [CI] 8.3–45) versus 14% (95% CI 10–18; p = 0.12), non-relapse mortality was 6.7% (95% CI 1.1–19) versus 12% (95% CI 8.5–15; p = 0.47), overall survival was 76.4% (95% CI 62.5–93.3) versus 78.1% (95% CI 73.7–82.7; p = 0.5), and leukemia-free survival was 69% (95% CI 51.8–91.8) versus 74.3% (95% CI 69.8–79.2; p = 0.5) in the \geq 60- and <60-year groups, respectively.

Conclusions

Patients aged \ge 60 years are characterized by a less favorable baseline profile at the time of allogeneic hematopoietic stem cell transplantation, including a higher frequency of secondary acute myeloid leukemia, measurable residual disease positivity, and more pronounced comorbidity. Consequently, reduced-intensity conditioning regimens are universally applied in this group. Nevertheless, key transplantation outcomes are comparable with those in patients <60 years. Thus, chronological age is becoming a less restrictive factor owing to modern approaches to peri-transplant management.

Table 1. Comparative characteristics of the groups

Median age, years (range) n=349 n=30 CO,001 Sex, n (%) 37 (18-59) 63 (60-75) <0,001 Female 187 (53,6) 18 (60,0) 18 (60,0) Male 162 (46,4) 12 (40,0) 12 (40,0) Secondary acute myeloid leukemia, n (%) 305 (87,4) 21 (70,0) 20 (70,0) Yes 44 (12,6) 9 (30,0) 44 (12,6) 9 (30,0) Risk ELN 2022, n (%) 20 (5,8) 0 (0,0) 0 (0,0) Favorable 20 (5,8) 0 (0,0) 0 (0,0) Intermediate 280 (80,2) 27 (90,0) 4 (14,0) Adverse 49 (14,0) 3 (10,0) 0 (0,057) Measurable residual disease status, n (%) 220 (71,4) 14 (51,9) 0 (0,057) Negative 88 (28,6) 13 (48,1) 3 (10,0) 1 (3,3) <td< th=""><th></th><th><60 years</th><th>≥60 years</th><th>p</th></td<>		<60 years	≥60 years	p
Sex, n (%) 187 (53,6) 18 (60,0) 0,6 Female Male 187 (53,6) 18 (60,0) 0,03 Secondary acute myeloid leukemia, n (%) 305 (87,4) 21 (70,0) 0,03 No Yes 44 (12,6) 9 (30,0) 0,03 Risk ELN 2022, n (%) 20 (5,8) 0 (0,0) 0,44 Favorable Intermediate 280 (80,2) 27 (90,0) 0,44 Adverse 49 (14,0) 3 (10,0) 0,057 Positive Negative 220 (71,4) 14 (51,9) 0,057 Negative Status, n (%) 220 (71,4) 14 (46,7) 0,001 10-1 217 (62,2) 1 (3,3) 20,001 2-3 113 (32,4) 14 (46,7		n=349	n=30	
Female Male 187 (53,6) 12 (40,0) 18 (60,0) 12 (40,0) Secondary acute myeloid leukemia, n (%) 0,03 No Yes 305 (87,4) 21 (70,0) 9 (30,0) 21 (70,0) 9 (30,0) Risk ELN 2022, n (%) 20 (5,8) 0 (0,0) 27 (90,0) 49 (14,0) 3 (10,0) 0,044 Favorable 280 (80,2) 27 (90,0) Adverse 49 (14,0) 3 (10,0) 0,057 Measurable residual disease status, n (%) 220 (71,4) 14 (51,9) 13 (48,1) 14 (51,9) 13 (48,1) Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 13 (48,1) 0,001 0-1 217 (62,2) 1 13 (32,4) 14 (46,7) 24 19 (5,4) 15 (50) 0,63 Donor type, n (%) 66 (18,9) 3 (10,0) 10/10 unrelated 131 (37,6) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 14 (46,	Median age, years (range)	37 (18-59)	63 (60-75)	<0,001
Male 162 (46,4) 12 (40,0) Secondary acute myeloid leukemia, n (%) 0,03 No 305 (87,4) 21 (70,0) Yes 44 (12,6) 9 (30,0) Risk ELN 2022, n (%) 20 (5,8) 0 (0,0) Favorable 280 (80,2) 27 (90,0) Intermediate 280 (80,2) 27 (90,0) Adverse 49 (14,0) 3 (10,0) Measurable residual disease status, n (%) 220 (71,4) 14 (51,9) Positive 220 (71,4) 14 (51,9) Negative 88 (28,6) 13 (48,1) Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 2-3 113 (32,4) 14 (46,7) ≥4 19 (5,4) 15 (50) Donor type, n (%) 66 (18,9) 3 (10,0) 10/10 unrelated 66 (18,9) 3 (10,0) 10/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 49 (14,0) 0 (0,0) Myeloablative 49 (14,0) 30 (100,0) Stem cell source, n (%) 273 (78,	Sex, n (%)			0,6
Secondary acute myeloid leukemia, n (%) No Yes Risk ELN 2022, n (%) Favorable Intermediate Adverse Adverse Measurable residual disease status, n (%) No Positive Negative Simplified comorbidity index, n (%) 0-1 2-3 2-3 113 (32,4) 14 (46,7) 24 19 (5,4) 15 (50) Donor type, n (%) 10/10 related 10/10 unrelated 1131 (37,6) 110/10 unrelated 1131 (37,6) 13 (43,4) 14 (46,7) 15 (50) Conditioning regimen intensity, n (%) Myeloablative Reduced-intensity Stem cell source, n (%) Mobilized peripheral blood stem cells 0,03 0,03 0,03 0,003 0,003 0,003 0,000 0,000 0,000 0,000 0,003 0,003 0,003 0,000 0,003 0,000 0,003 0,003 0,003 0,003 0,004 0,003 0,	Female	187 (53,6)	18 (60,0)	
No Yes 305 (87,4) 21 (70,0) 9 (30,0) Risk ELN 2022, n (%)	Male	162 (46,4)	12 (40,0)	
Yes 44 (12,6) 9 (30,0) Risk ELN 2022, n (%) 0,44 Favorable 20 (5,8) 0 (0,0) Intermediate 280 (80,2) 27 (90,0) Adverse 49 (14,0) 3 (10,0) Measurable residual disease status, n (%) 220 (71,4) 14 (51,9) Positive 220 (71,4) 14 (51,9) 0,057 Negative 88 (28,6) 13 (48,1) Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 1 (3,3) 1 (32,4) 14 (46,7) 24 19 (5,4) 15 (50) 0,63 Donor type, n (%) 66 (18,9) 3 (10,0) 0,63 0,63 0,63 0,63 0,63 0,63 0,63 0,00 0,63 0,63 0,00 0,00 0,63 0,00 0,0	Secondary acute myeloid leukemia, n (%)			0,03
Risk ELN 2022, n (%) Favorable Intermediate Adverse Measurable residual disease status, n (%) Positive Negative Simplified comorbidity index, n (%) 217 (62,2) 21 (3,3) 2-3 2-3 113 (32,4) 24 19 (5,4) 15 (50) Donor type, n (%) 10/10 related 10/10 unrelated 466 (18,9) 13 (43,4) 19 (50,4) 13 (43,4) 19 (72,3) 13 (43,4) 14 (46,7) 15 (50) 0,63 10/10 related 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) Myeloablative Reduced-intensity Stem cell source, n (%) Mobilized peripheral blood stem cells 20 (5,8) 0 (0,0) 280 (80,2) 27 (90,0) 27 (90,0) 280 (80,2) 27 (90,0) 227 (90,0) 0,057 0,057 0,057 0,057 0,057 0,057 0,057 0,057 0,057 0,057 0,057 0,057 0,001 0,011 0-1 13 (37,6) 13 (43,4) 14 (46,7) 15 (50) 0,63 0,63 0,63 0,001 0,002 0,002 0,002	No	305 (87,4)	21 (70,0)	
Favorable 20 (5,8) 0 (0,0) 280 (80,2) 27 (90,0) 3 (10,0) 49 (14,0) 3 (10,0)	Yes	44 (12,6)	9 (30,0)	
Intermediate Adverse 280 (80,2) 27 (90,0) 3 (10,0)	Risk ELN 2022, n (%)			0,44
Adverse 49 (14,0) 3 (10,0) Measurable residual disease status, n (%) Positive 220 (71,4) 14 (51,9) Negative 88 (28,6) 13 (48,1) Simplified comorbidity index, n (%) 0-1 217 (62,2) 1 (3,3) 2-3 113 (32,4) 14 (46,7) 24 19 (5,4) 15 (50) Donor type, n (%) 10/10 related 66 (18,9) 3 (10,0) 10/10 unrelated 9/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) Myeloablative 49 (14,0) 0 (0,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) Mobilized peripheral blood stem cells 273 (78,2) 27 (90,0)	Favorable	20 (5,8)	0 (0,0)	
Measurable residual disease status, n (%) 220 (71,4) 14 (51,9) 0,057 Positive 220 (71,4) 14 (51,9) 13 (48,1) Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 20,001 0-1 217 (62,2) 1 (3,3) 14 (46,7) <td>Intermediate</td> <td>280 (80,2)</td> <td>27 (90,0)</td> <td></td>	Intermediate	280 (80,2)	27 (90,0)	
Positive Negative 220 (71,4) 14 (51,9) 13 (48,1) 13 (48,1) Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 14 (46,7) 14 (46,7) 19 (5,4) 15 (50) 0,001 D-1 217 (62,2) 1 (3,3) 14 (46,7) 19 (5,4) 15 (50) 15 (50) 0,63 Donor type, n (%) 66 (18,9) 3 (10,0) 13 (43,4) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 13 (43,4) 14 (46,7) 14 (46,7) 15 (50	Adverse	49 (14,0)	3 (10,0)	
Negative 88 (28,6) 13 (48,1) Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 0-1 217 (62,2) 1 (3,3) 2-3 113 (32,4) 14 (46,7) ≥4 19 (5,4) 15 (50) Donor type, n (%) 66 (18,9) 3 (10,0) 10/10 related 66 (18,9) 3 (10,0) 10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 49 (14,0) 0 (0,0) Myeloablative 49 (14,0) 30 (100,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 273 (78,2) 27 (90,0)	Measurable residual disease status, n (%)			0,057
Simplified comorbidity index, n (%) 217 (62,2) 1 (3,3) 2-3 113 (32,4) 14 (46,7) ≥4 19 (5,4) 15 (50) Donor type, n (%) 66 (18,9) 3 (10,0) 10/10 related 66 (18,9) 3 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 49 (14,0) 0 (0,0) Myeloablative 49 (14,0) 30 (100,0) Stem cell source, n (%) 300 (86,0) 30 (100,0) Mobilized peripheral blood stem cells 273 (78,2) 27 (90,0)	Positive	220 (71,4)	14 (51,9)	
0-1 2-3 2-3 113 (32,4) 14 (46,7) 24 19 (5,4) 15 (50) Donor type, n (%) 10/10 related 66 (18,9) 10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) Myeloablative Reduced-intensity 300 (86,0) Stem cell source, n (%) Mobilized peripheral blood stem cells 217 (62,2) 1 (3,3) 14 (46,7) 15 (50) 0,63 0,63 13 (43,4) 7 (23,3) 0 (0,0) 0,02 0,02	Negative	88 (28,6)	13 (48,1)	
2-3 ≥4 113 (32,4) 14 (46,7) 19 (5,4) 15 (50) Donor type, n (%) 10/10 related 66 (18,9) 10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) Myeloablative Reduced-intensity 49 (14,0) Reduced-intensity 300 (86,0) Stem cell source, n (%) Mobilized peripheral blood stem cells 113 (32,4) 14 (46,7) 15 (50) 0,63 46 (18,9) 7 (23,3) 7 (23,3) 0,02 0,02	Simplified comorbidity index, n (%)			<0,001
≥4 19 (5,4) 15 (50) Donor type, n (%) 10/10 related 66 (18,9) 3 (10,0) 10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) Myeloablative 49 (14,0) 0 (0,0) Reduced-intensity Stem cell source, n (%) Mobilized peripheral blood stem cells 19 (5,4) 15 (50) 0,63 0,63 13 (43,4) 7 (23,3) 0 (23,3) 0 (0,0) 0,02 0,02 0,2	0-1	217 (62,2)	1 (3,3)	
Donor type, n (%) 0,63 10/10 related 66 (18,9) 3 (10,0) 10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 0,02 Myeloablative 49 (14,0) 0 (0,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 273 (78,2) 27 (90,0)	2-3	113 (32,4)	14 (46,7)	
10/10 related 66 (18,9) 3 (10,0) 10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 49 (14,0) 0 (0,0) Myeloablative 49 (14,0) 30 (100,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 273 (78,2) 27 (90,0)	≥4	19 (5,4)	15 (50)	
10/10 unrelated 131 (37,6) 13 (43,4) 9/10 unrelated 86 (24,6) 7 (23,3) Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 0,02 Myeloablative 49 (14,0) 0 (0,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 273 (78,2) 27 (90,0)	Donor type, n (%)			0,63
9/10 unrelated 86 (24,6) 7 (23,3) 7 (23,3) 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 9/10 unrelated 66 (18,9) 9/10 unrelated 66 (18,9) 9/10 unrelated 7 (23,3) 9/10 unrelated 66 (18,9) 9/10 unrelated 66 (18	10/10 related	66 (18,9)	3 (10,0)	
Haploidentical 66 (18,9) 7 (23,3) Conditioning regimen intensity, n (%) 0,02 Myeloablative 49 (14,0) 0 (0,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 273 (78,2) 27 (90,0)	10/10 unrelated	131 (37,6)	13 (43,4)	
Conditioning regimen intensity, n (%) Myeloablative Reduced-intensity Stem cell source, n (%) Mobilized peripheral blood stem cells O,02 49 (14,0) 300 (86,0) 30 (100,0) 0,2 273 (78,2) 27 (90,0)	9/10 unrelated	86 (24,6)	7 (23,3)	
Myeloablative 49 (14,0) 0 (0,0) Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 0,2 Mobilized peripheral blood stem cells 273 (78,2) 27 (90,0)	Haploidentical	66 (18,9)	7 (23,3)	
Reduced-intensity 300 (86,0) 30 (100,0) Stem cell source, n (%) 0,2 Mobilized peripheral blood stem cells 273 (78,2) 27 (90,0)	Conditioning regimen intensity, n (%)			0,02
Stem cell source, n (%) Mobilized peripheral blood stem cells 273 (78,2) 27 (90,0)	Myeloablative	49 (14,0)	0 (0,0)	
Mobilized peripheral blood stem cells 273 (78,2) 27 (90,0)	Reduced-intensity	300 (86,0)	30 (100,0)	
	·			0,2
Bone marrow 76 (21,8) 3 (10,0)	Mobilized peripheral blood stem cells	• • •	, ,	
	Bone marrow	76 (21,8)	3 (10,0)	