Efficacy, safety, and health-related quality of life in transplant-ineligible newly diagnosed multiple myeloma patients receiving bortezomib maintenance therapy: a study of the Korean Multiple Myeloma Working Party KMMWP-174 study

Authors

Jung Yeon Lee,^{1,2*} Seungpil Jung,^{3-5*} Suein Choi,³⁻⁵ Sung-Soo Park,¹ Jin Seok Kim,² Je-Jung Lee,⁶ Seong Kyu Park,⁷ Hyo Jung Kim,⁸ Gyeong-Won Lee,⁹ Young Hoon Park,¹⁰ Hyeon-Seok Eom,¹¹ Jeong-A Kim,¹² Min Kyoung Kim,¹³ Yundeok Kim,¹⁴ Ho-Jin Shin,¹⁵ Ho Sup Lee,¹⁶ Jihyun Kwon¹⁷ and Chang-Ki Min;¹ for the Korean Multiple Myeloma Working Party (KMMWP)

¹Department of Hematology, Catholic Hematology Hospital, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul; ²Division of Hematology, Department of Internal Medicine, Yonsei University College of Medicine, Severance Hospital, Seoul; ³Pharmacometrics Institute for Practical Education and Training (PIPET), College of Medicine, The Catholic University of Korea, Seoul; ⁴Department of Pharmacology, College of Medicine, The Catholic University of Korea, Seoul; 5Division of Data Science, Catholic Research Network for Multiple Myeloma; ⁶Department of Hematology-Oncology, Chonnam National University Hwasun Hospital, Chonnam National University Medical School, Hwasun, Jeollanam-do; ⁷Department of Internal Medicine, Soonchunhyang University Bucheon Hospital, Soonchunhyang University College of Medicine, Seoul; *Department of Hematology-Oncology, Hallym University Medical Center, Hallym University College of Medicine, Anyang; ⁹Division of Hematology-Oncology, Department of Internal Medicine, Gyeongsang National University Hospital, Gyeongsang National University College of Medicine, Jinju; 10 Division of Hematology-Oncology, Department of Internal Medicine, Ewha Womans University Medical Center Mokdong Hospital, Seoul;

¹¹Department of Hematology-Oncology, Center for Hematologic Malignancy, National Cancer Center, Goyang; ¹²Department of Internal Medicine, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Seoul; ¹³Division of Hemato-Oncology, Department of Internal Medicine, Yeungnam University College of Medicine, Daegu; ¹⁴Division of Hemato-Oncology, Department of Internal Medicine, Wonju Severance Christian Hospital, Wonju; ¹⁵Division of Hematology-Oncology, Department of Internal Medicine, Biochemical Research Institution, Pusan National University Hospital, Pusan National University School of Medicine, Busan; ¹⁶Department of Internal Medicine, Kosin University College of Medicine, Kosin University Gospel Hospital, Busan and ¹⁷Department of Internal Medicine, Hematology and Oncology, Chungbuk National University, College of Medicine, Chungbuk, Republic of Korea

*JYL and SJ contributed equally as first authors.

Correspondence:

C-K MIN - ckmin@catholic.ac.kr

https://doi.org/10.3324/haematol.2025.287889

Received: March 22, 2025. Accepted: July 29, 2025. Early view: August 7, 2025.

©2026 Ferrata Storti Foundation

Published under a CC BY-NC license

Table S1. Induction chemotherapy and Bortezomib maintenance therapy

Variables	Total		
variables	(N=78)		
Induction chemotherapy regimen, number (%)			
VMP	73 (93.6%)		
VTD	3 (3.8%)		
VD	1 (1.3%)		
MP	1 (1.3%)		
Induction chemotherapy response, number (%)			
CR	18 (23.1%)		
VGPR	36 (46.2%)		
PR	24 (30.8%)		
Bortezomib maintenance therapy cycles, number, median (range)	9.5 (1-26)		
Bortezomib maintenance therapy duration, months, median (range)	9.4 (0.9-26.4)		

^{*}Abbreviations: VMP, bortezomib-melphalan-prednisone; VTD, bortezomib-thalidomide-dexamethasone; VD, bortezomib-dexamethasone; MP, melphalan-prednisone; CR, complete response; VGPR, very good partial response; PR, partial response

Table S2. EORTC-QLQ-C30 and EORTC-QLQ-MY20 scores of MM patients at baseline and end of treatment

Variables ¹	Baseline (N = 78)	EoT (N = 73)	P-value ²	
Global health status / QoL	61.32 (18.94)	56.05 (20.85)	0.040	
Functional scales	78.68 (15.95)	74.51 (15.65)	0.006	
Physical functioning	74.89 (20.35)	73.70 (17.42)	0.210	
Role functioning	74.79 (23.07)	71.69 (20.16)	0.045	
Emotional functioning	84.72 (16.96)	78.54 (21.33)	0.005	
Cognitive functioning	82.91 (15.19)	75.80 (20.04)	< 0.001	
Social functioning	75.64 (23.68)	69.86 (25.25)	0.037	
Symptom scales / items	18.47 (14.53)	20.05 (12.06)	0.243	
Fatigue	27.78 (20.94)	31.05 (17.66)	0.084	
Nausea and vomiting	4.06 (11.45)	4.34 (8.35)	0.748	
Pain	24.57 (25.44)	23.97 (21.51)	0.948	
Dyspnea	20.51 (29.04)	21.00 (23.90)	0.704	
Insomnia	20.09 (25.39)	20.55 (25.23)	0.795	
Appetite loss	17.52 (24.46)	17.81 (23.62)	0.683	
Constipation	15.81 (25.61)	15.98 (22.30)	0.726	
Diarrhea	6.41 (16.17)	7.41 (16.99)	0.829	
Financial difficulties	19.23 (24.33)	28.24 (28.34)	0.009	
EORTC-QLQ-MY20				
Disease symptoms	17.82 (14.66)	20.09 (13.88)	0.187	
Side-effects of treatment	14.64 (12.97)	16.44 (10.86)	0.124	
Body image	78.21 (24.52)	73.06 (26.44)	0.080	
Future perspective	69.94 (22.73)	63.17 (26.64)	0.030	

¹All variables are summarized by Mean (SD)

²Paired t-test of 73 patients

^{*}Abbreviations: EORTC, European Organization for Research and Treatment of Cancer; QLQ-C30: Quality of Life Questionnaire Core-30; QLQ-MY20, Quality of Life Questionnaire Myeloma Module (QLQ-MY20); SD, Standard Deviation; QoL, Quality of Life; EoT, End of Treatment;

Figure S1. Forest plot for comparing 2-year survival rate of each group

Variable	2-Year PFS (%)		2-Year PFS2 (%)		2-Year OS (%)	
Overall	53.4 (43.3, 65.8)	-	85.2 (77.5, 93.7)	-	94.6 (89.6, 99.9)	-
Age						
<70	56.0 (39.6, 79.3)	-	83.8 (70.5, 99.7)	-	96.0 (88.6, 100.0)	-
70-74	47.1 (32.9, 67.2)	-	87.8 (77.2, 99.8)	-	93.8 (85.9, 100.0)	-
≥75	61.5 (42.7, 88.6)	_	82.4 (66.1, 100.0)	-	94.1 (83.6, 100.0)	-
Gender						
Female	57.7 (42.0, 79.1)		81.5 (68.1, 97.5)	-	92.6 (83.2, 100.0)	-
Male	51.0 (38.8, 67.1)	-	87.3 (78.3, 97.3)	-	95.8 (90.2, 100.0)	
Type of myeloma						
lgG	52.8 (39.4, 70.7)	-	84.6 (74.0, 96.7)	-	97.4 (92.6, 100.0)	
Non-IgG	54.1 (40.2, 72.8)	-	85.8 (75.0, 98.2)	-	91.6 (82.9, 100.0)	-
ISS						
Ĭ	55.0 (37.0, 81.8)	-	80.0 (64.3, 99.6)	-	95.0 (85.9, 100.0)	-
2	56.7 (40.3, 79.7)	-	88.0 (76.0, 100.0)	-	92.0 (81.9, 100.0)	-
3	53.3 (38.2, 74.5)	-	85.7 (73.6, 99.7)	-	96.3 (89.4, 100.0)	-
Cytogenetic profile						
High risk	55.0 (37.0, 81.8)		84.4 (69.7, 100.0)	-	95.0 (85.9, 100.0)	-6
Standard risk	50.0 (32.3, 77.5)		78.3 (61.5, 99.6)	-	88.9 (75.5, 100.0)	
Unknown	54.3 (40.4, 73.0)		89.0 (79.3, 99.8)	-	97.3 (92.2, 100.0)	
GFR						
<30	60.0 (36.2, 99.5)	_	88.9 (70.6, 100.0)	-	88.9 (70.6, 100.0)	-
30-59	64.9 (45.8, 92.0)	-	76.5 (58.7, 99.5)	-	100.0 (100.0, 100.0)	
≥60	48.0 (36.0, 64.1)	-	87.5 (78.6, 97.4)	-	93.7 (87.1, 100.0)	-
Induction chemotherapy regimen						
Non-VMP	40.0 (13.7, 100.0)	-	100.0 (100.0, 100.0)	9	100.0 (100.0, 100.0)	
VMP	54.3 (43.9, 67.1)	-	84.2 (76.1, 93.2)	-	94.3 (89.0, 99.9)	
Induction chemotherapy response						
CR	83.3 (67.8, 100.0)		94.4 (84.4, 100.0)	-	100.0 (100.0, 100.0)	
PR	52.4 (35.5, 77.3)	-	86.4 (73.2, 100.0)	-	90.9 (79.7, 100.0)	
VGPR	38.9 (25.8, 58.6)	-	79.7 (67.4, 94.3)		94.3 (86.9, 100.0)	-
		0 25 50 75 1	1 00	0 25 50 75 10	00	0 25 50 75 10