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Evaluating Nutritional Indicators and Time to Next Treatment (TTNT) in Patients With Multiple Myeloma Undergoing Stem Cell Transplant: Real-World Data

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BACKGROUND

Nutritional status affects treatment and recovery in Multiple Myeloma (MM), especially for patients receiving Autologous Stem Cell Transplant (ASCT). Biomarkers such as albumin, lymphocytes, and cholesterol help predict outcomes, but their impact on Time to Next Treatment (TTNT) is less clear.

PURPOSE

This study aimed to evaluate the impact of peri-ASCT nutritional status on Time to Next Treatment (TTNT) in patients with Multiple Myeloma.

METHODOLOGY

This retrospective cohort study analyzed MM patients who underwent first-line ASCT, using the HealthTree Registry (PMID: 35271305). Subjects were classified according to calculated CONUT scores into normal, mild or moderate undernutrition groups using biomarkers extracted before ASCT and up to the start of the next-line of therapy. Baseline characteristics were compared using Kruskal-Wallis and Fisher's test, while TTNT was evaluated using Cox regression models.

RESULTS

A total of 380 patients with MM who underwent first-line ASCT were evaluated. The median age at ASCT was 61 years, and 53% were female. Overall, 63% of the cohort had R-ISS Stage II/III disease.

Based on CONUT scores, 11% patients were classified as normal, 68% with mild and 21% with moderate undernutrition. Patients with moderate undernutrition were more likely to have R-ISS stage II **(Table 1).**

The median TTNT for the entire cohort was 37.9 months, while the median TTNT was 48.4 months for the normal cohort, 35.7 months for the mild cohort, and 42.1 months for the moderate cohort **(Figure 1).**

Evaluating CONUT score as a continuous variable revealed a strong trend toward inferior TTNT. Specifically, every 1-point increase in the CONUT score was associated with a nearly 20% increased hazard for requiring subsequent therapy (Hazard Ratio [HR], 1.20; 95% CI, 1.00-1.44; p = 0.056).

CONCLUSION

Incorporating albumin, cholesterol, and lymphocyte counts for pre-ASCT nutritional assessment and post-ASCT follow-up identify malnutrition in MM, providing a window for targeted nutritional interventions that may positively impact TTNT.

Figure 1. Kaplan-Meier Estimates of Time to Next Treatment (TTNT) Stratified by Baseline Nutritional Status, with Number at Risk.

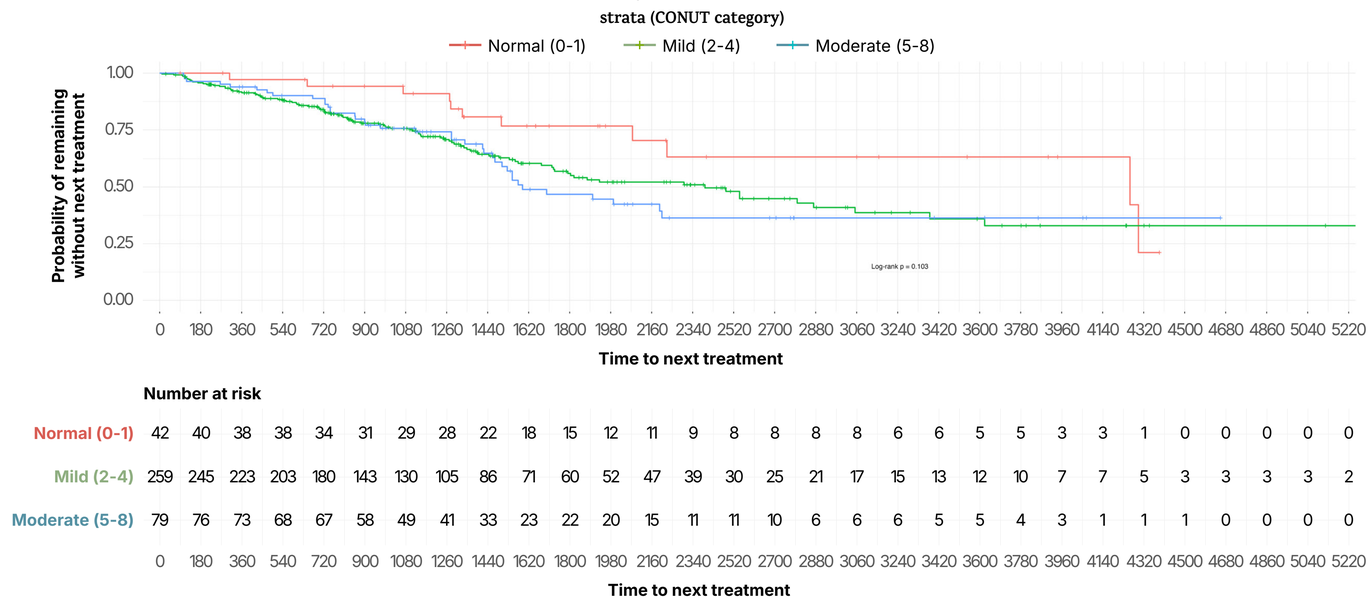

Table 1. Baseline Patient Characteristics Stratified by Pre-ASCT CONUT Score Category

CHARACTERISTIC	NORMAL (0-1) N = 42[1]	MILD (2-4) N = 259[1]	MODERATE (5-8) N = 79[1]	OVERALL N = 380[1]	P-VALUE[2]
AGE AT TRANSPLANT (YEARS)	59 (54, 63)	60 (54, 65)	64 (58, 69)	61 (55, 66)	0.001
GENDER					0.2
Female	23 (55%)	144 (56%)	35 (44%)	202 (53%)	
Male	19 (45%)	115 (44%)	44 (56%)	178 (47%)	
RACE					0.046
White	35 (83%)	233 (90%)	72 (91%)	340 (89%)	
Black or African American	4 (9.5%)	18 (6.9%)	3 (3.8%)	25 (6.6%)	
Other Race	0 (0%)	5 (1.9%)	0 (0%)	5 (1.3%)	
Asian	2 (4.8%)	2 (0.8%)	1 (1.3%)	5 (1.3%)	
Character (0)	1 (2.4%)	0 (0%)	2 (2.5%)	3 (0.8%)	
American Indian or Alaska Native	0 (0%)	0 (0%)	1 (1.3%)	1 (0.3%)	
Native Hawaiian or Other Pacific Islander	0 (0%)	1 (0.4%)	0 (0%)	1 (0.3%)	
R_ISS_STAGE					0.002
R-ISS Stage 1	3 (13%)	38 (23%)	8 (15%)	49 (20%)	
R-ISS Stage 2	15 (63%)	110 (67%)	45 (85%)	170 (71%)	
R-ISS Stage 3	6 (25%)	16 (9.8%)	0 (0%)	22 (9.1%)	
Unknown	18	95	26	139	
HR_CYTOGENETICS					0.057
High-risk feature present	23 (100%)	96 (82%)	25 (83%)	144 (85%)	
No canonical HR feature detected	0 (0%)	21 (18%)	5 (17%)	26 (15%)	
Unknown	19	142	49	210	
DEL_17P					0.2
Negative	12 (63%)	100 (76%)	30 (83%)	142 (76%)	
Positive	7 (37%)	32 (24%)	6 (17%)	45 (24%)	
Unknown	23	127	43	193	
GAIN_AMP_1Q					0.3
Negative	6 (27%)	49 (44%)	16 (47%)	71 (43%)	
Positive	16 (73%)	62 (56%)	18 (53%)	96 (57%)	
Unknown	20	148	45	213	
T_4_14					0.032
Negative	6 (40%)	61 (71%)	16 (80%)	83 (69%)	
Positive	9 (60%)	25 (29%)	4 (20%)	38 (31%)	
Unknown	27	173	59	259	
T_14_16					0.3
Negative	6 (100%)	54 (79%)	15 (94%)	75 (83%)	
Positive	0 (0%)	14 (21%)	1 (6.3%)	15 (17%)	
Unknown	36	191	63	290	
T_14_20					>0.9
Negative	2 (100%)	32 (86%)	6 (100%)	40 (89%)	
Positive	0 (0%)	5 (14%)	0 (0%)	5 (11%)	
Unknown	40	222	73	335	
T_11_14					0.8
Negative	7 (58%)	72 (64%)	16 (59%)	95 (63%)	
Positive	5 (42%)	41 (36%)	11 (41%)	57 (38%)	
Unknown	30	146	52	228	
SCT_BEST_RESPONSE					
CR	21 (50%)	101 (39%)	32 (41%)	154 (41%)	
sCR	11 (26%)	73 (28%)	25 (32%)	109 (29%)	
VGPR	6 (14%)	55 (21%)	16 (20%)	77 (20%)	
PR	3 (7.1%)	20 (7.7%)	3 (3.8%)	26 (6.8%)	
PD	1 (2.4%)	10 (3.9%)	3 (3.8%)	14 (3.7%)	
EVER_CHOLESTEROL_MED	18 (43%)	98 (38%)	45 (57%)	161 (42%)	0.011
CONUT SCORE					
0	20 (48%)	0 (0%)	0 (0%)	20 (5.3%)	
1	22 (52%)	0 (0%)	0 (0%)	22 (5.8%)	
2	0 (0%)	45 (17%)	0 (0%)	45 (12%)	
3	0 (0%)	137 (53%)	0 (0%)	137 (36%)	
4	0 (0%)	77 (30%)	0 (0%)	77 (20%)	
5	0 (0%)	0 (0%)	48 (61%)	48 (13%)	
6	0 (0%)	0 (0%)	20 (25%)	20 (5.3%)	
7	0 (0%)	0 (0%)	8 (10%)	8 (2.1%)	
8	0 (0%)	0 (0%)	3 (3.8%)	3 (0.8%)	
ALBUMIN (g/dL)	4.00 (3.80, 4.30)	4.00 (3.70, 4.20)	3.40 (3.20, 4.00)	3.90 (3.70, 4.20)	<0.001
ABSOLUTE LYMPHOCYTE COUNT (/mm3)	1,800 (1,460, 2,500)	400 (190, 820)	300 (100, 570)	410 (190, 1,000)	<0.001
TOTAL CHOLESTEROL (mg/dL)	193 (182, 211)	187 (165, 217)	137 (115, 174)	182 (155, 211)	<0.001
TTNT AFTER ASCT (DAYS)	1,472 (899, 2,222)	1,085 (600, 1,771)	1,281 (859, 1,992)	1,155 (698, 1,830)	0.011

[1] Median (Q1, Q3); n (%).
[2] Kruskal-Wallis rank sum test; Fisher's exact test; N/A.