The importance of physical function in patients with multiple myeloma for improving quality of life

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Background

Multiple myeloma is a hematologic cancer of the plasma cells associated with a heavy symptom burden that reduces overall health-related quality of life.

(Thierry Facon, 2017)

Quality of life and physical function of patients with multiple myeloma are deteriorated.

(Shirin Shallwani, 2015)

Although there is a growing interest in the quality of life of patients with multiple myeloma, there are still few studies comparing them with other cancers.

Objective

To find out the relation between physical function and quality of life in multiple myeloma patients.

Methods

- Retrospective cross-sectional study
- Inclusion criteria
 - 2017.10~2018.05
 - Multiple myeloma patient
 - Consulted to the department of rehabilitation medicine
- Clinical factor
 - Patient-related : age, sex
 - Disease, treatment-related : disease duration, transplantation status, cancer stage (ISS and DSS stage), baseline and current laboratory findings (hemoglobin, calcium, creatinine, albumin)
- Assessment
 - Quality of life : QLQ-C30, QLQ-MY20
 - Physical function : mini-balance evaluation systems (mini-BESTest)
 - Others : Fatigue severity score, Beck depression index (BDI)
- Statistical analysis
 - Bivariate correlation analysis was used to estimate the relation between physical function and quality of life and other clinical factors. Associations were estimated with correlation coefficient (R).
 - Using age-based normative value of mini-BESTest (Kathryn M. Sibley, 2014), compare clinical factors of two groups (good-function group vs poor-function group) via student T-test.

Results

Table 1. Demographic and Clinical Characteristics

Characteristic	All (N=63)	Good-function group (N=33)	Poor-function group (N=30)
Age (y)	63.78 ± 9.45	64.06 ± 8.83	63.47 ± 10.24
Male sex	33 (52.4 %)	16 (48.5 %)	17 (56.7 %)
Disease duration (d)	1103.78 ± 975.32	1343.48 ± 1057.68	840.10 ± 813.62
Baseline laboratory findings			
Hemoglobin	10.52 ± 2.51	10.21 ± 2.30	10.86 ± 2.72
Calcium	9.36 ± 1.47	9.42 ± 0.75	9.30 ± 1.20
Creatinine	1.30 ± 1.12	1.51 ± 2.36	1.07 ± 0.74
Albumin	3.85 ± 3.89	4.00 ± 0.65	3.68 ± 1.46
β2-microglobulin	3.95 ± 3.90	3.82 ± 4.13	4.11 ± 3.69
Current laboratory findings			
Hemoglobin	11.29 ± 1.89	11.85 ± 1.86 *	10.68 ± 1.75 *
Calcium	8.86 ± 0.65	8.98 ± 0.54	8.73 ± 0.74
Creatinine	1.02 ± 0.62	1.01 ± 0.52	1.02 ± 0.71
Albumin	3.88 ± 0.51	4.06 ± 0.43 *	3.67 ± 0.52 *
ISS stage	1.67 ± 0.92	1.64 ± 0.78	1.70 ± 1.06
D-S stage	2.86 ± 0.44	2.85 ± 0.44	2.87 ± 0.43
Transplant patient (N)	34 (54 %)	19 (57.6 %)	15 (50%)

ISS stage : International Staging System, DS stage : Durie-Salmon Staging System
* P value < 0.05

Figure 1. Subjective functional, psychological status of good-physical function and poor-physical function group
QoL : Global health status / Quality of life, SE of treatment : side effect of treatment, * P value < 0.05

Figure 2. Demographic, clinical factor of two groups of good-physical function and poor-physical function group
* P value < 0.05

Table 2. Pearson correlation coefficients for the relation between mini-BESTest and subjective functional status and psychosocial status

	QLQ-C30						QLQ-MY20			
	Quality of Life	Physical function	Role function	Emotional function	Cognitive function	Social function	Disease symptom	Treatment side effect	Fatigue severity scale	Beck depression index
Pearson coefficient	.378	.684	.540	.369	.342	.589	-.390	-.411	-.391	-.538
p value	.002	.000	.000	.003	.006	.000	.002	.001	.002	.000

Table 3. Pearson correlation coefficients for the relation between mini-BESTest and demographic and clinical factors

	Age	Disease Duration	Baseline Hb	Baseline Calcium	Baseline Cr	Baseline Albumin	ISS stage	D-S stage	Current Hb	Current Calcium	Current Cr	Current Albumin
Pearson coefficient	-.363	.071	-.051	-.211	.038	.079	-.184	-.054	.396	.211	-.127	.440
p value	.003	.578	.689	.097	.765	.539	.148	.673	.001	.096	.321	.000

Primary outcome - Physical function and Quality of life

- MiniBESTest score and 'Global health status & Quality of life' question of QLQ-C30 had significant positive correlation (Pearson coefficient 0.378, P value 0.002)
- Good-physical function group had higher QLQ-C30 score than poor-physical function group, in all domains except 'cognitive function'.

Results of other analysis

1) Physical function and clinical factor

- Current hemoglobin, albumin level had positive correlation with miniBESTest score.

2) Demographic factor and subjective functional status

- Disease duration and 'Global health status & Quality of life' in QLQ-C30 had positive correlation (Pearson coefficient 0.275, P value 0.03)
- Age and 'Physical function' in QLQ-C30 had negative correlation (Pearson coefficient -0.297, P value 0.18)

3) Subdomain of miniBESTest and subjective functional status

- Sensory orientation and 'Side effects of treatment' in QLQ-MY20 had positive correlation (Pearson coefficient 0.294, P value 0.02)
- No subdomain had a significant correlation with 'Global health status & Quality of life' in QLQ-C30

Conclusion

In patients with multiple myeloma, physical function has a significant relationship with quality of life. Clinical factors - low hemoglobin and albumin level - have association with poor physical function.

So, both medical supportive care and physical rehabilitation are important for patients' quality of life.