Importance of monitoring physical function for quality of life assessments In hematopoietic stem cell transplantation patients

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Background

Despite these clear benefits, HSCT is also associated with physical (e.g., reduced strength, fatigue, and diminished cardiovascular function) and psychological (e.g., depression, anxiety, stress, and reduced self-esteem) consequences, which adversely influence quality of life.

(Hayes S et al., 2004)

Physical function is known to decrease after HSCT, with the most substantial impairment noted at 90 days post-transplant, and pre-transplant levels of functioning tend to return within 1 year.

(Shirin Shallwani, 2015)

However, little is known about the natural course of physical function during the acute post-transplant period.

Objective

To monitor the changes in physical function through serial evaluations of the DEMMI, and identify the effect of physical function on QoL during the acute post-transplant period..

Methods

- Prospective cohort study
- Inclusion criteria
 - 2016.08~2017.05
 - Over 18 years old
 - Planning autologous or allogeneic HSCT
- Monitoring physical function

- Assessment
 - Quality of life : QLQ-C30
 - Physical function : De Morton Mobility Index (DEMMI)
 - Others : VAS, Zung Self-rating Depression Scale (SDS)
- Group
 - Good PF : less 2 points decrements of DEMMI
 - Poor PF : minimal 2 points decrements of DEMMI

(New PW et al, 2016)

Results

Table 1. General patient characteristics

	Good PF (N=31)	Poor PF (N=10)	p value
Age (y)	47.87 ± 14.44	50.96 ± 13.55	0.501
Male sex	18 (58.1 %)	5 (50.0 %)	0.724
Disease duration (d)	1103.78 ± 975.32	1343.48 ± 1057.68	840.10 ± 813.62
Type of Cancer (n)			0.791
Multiple myeloma	8	3	
Lymphoma	7	4	
Myelodysplastic syndrome	8	1	
AML	5	1	
ALL	1	1	
Others	2	0	
Type of HSCT (n)			0.469
Autograft	13	6	
Allograft	18	4	
Previous chemotherapy (times)	6.71 ± 5.84	7.30 ± 3.16	0.200
Complete remission (n)	16	4	0.701
Radiotherapy (n)	3	1	1.000

Age and previous chemotherapy were analyzed with the Mann-Whitney test. Sex, type of cancer, type of HSCT, complete remission, radiotherapy, and rehabilitation treatment were analyzed with Fisher's exact test.

Figure 1. DEMMI scores as a measurement of physical function after HSCT. The impaired physical function group showed a decreased DEMMI score after 1 week, which significantly decreased from the baseline after 2 weeks ($p < 0.05$)

Figure 2. Decrement of DEMMI scores in both groups after HSCT. Compared with the good physical function group, the impaired physical function group showed a decreased DEMMI score after 1 week ($p < 0.05$)

Table 2. Relation of quality of life with physical impairment

	Good PF (N=31)	Poor PF (N=10)	p value
VAS			
Admission	2.77 ± 2.07	2.40 ± 1.84	0.643
Discharge	3.29 ± 2.13	4.10 ± 2.33	0.300
EORTC C-30			
Physical functioning			
Admission	72.26 ± 14.92	53.33 ± 19.88	0.006
Discharge	71.40 ± 13.24	45.33 ± 23.89	0.002
Role functioning			
Admission	65.59 ± 26.15	50.00 ± 27.22	0.143
Discharge	67.74 ± 23.15	43.33 ± 31.62	0.039
Emotional functioning			
Admission	72.31 ± 22.09	50.83 ± 32.74	0.036
Discharge	76.08 ± 18.35	58.33 ± 29.92	0.046
Cognitive functioning			
Admission	80.65 ± 14.34	66.67 ± 13.61	0.018
Discharge	82.26 ± 15.48	68.33 ± 18.34	0.042
Social functioning			
Admission	57.53 ± 26.12	48.33 ± 34.65	0.520
Discharge	62.37 ± 23.16	50.00 ± 33.33	0.329
SDS			
Admission	41.39 ± 6.46	47.44 ± 9.37	0.055
Discharge	39.00 ± 6.36	47.70 ± 9.46	0.014

Laboratory findings related with physical function

There were no significant differences in the change of all laboratory variables from D0 to D7 between the groups

Conclusion

Patients during acute post-transplant period had physical impairment and QoL of pre-transplantation was considered as a predictive factor for physical impairment. The physical impairment can be detected in early period after HSCT. Therefore, monitoring of standardized functional outcome measures score is important to maintain the physical impairment during HSCT.