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General Characteristics and Functional Outcomes in the Elderly Patients with Spinal Cord Injury

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Objectives

To investigate the general characteristics and functional outcomes of the spinal cord injury (SCI) in elderly compared with younger patients.

Methods

We reviewed the medical records of the SCI patients who treated and discharged from inpatient rehabilitation clinic service of a tertiary medical institution, retrospectively. A total of 127 patients were enrolled, and divided into two groups according to age; 53 of elderly group (≥60 year) and 73 of younger group (<60 year). Demographics and clinical datas were collected such as age, gender, time since injury, length of hospital stay, cause of injury, severity and level of injury etc. The functional outcomes at admission and discharge were also analyzed; the Korean version of the modified Barthel Index (K-MBI), Spinal Cord Independence Measure II (SCIM II), Walking Index for Spinal Cord Injury (WISCI).

Results

The mean age of the elderly group was 68.3 ± 6.5 years, and younger group was 45.7 ± 11.6 years. In the elderly group, 30 males and 23 females were found, and 61 males and 12 females in the young group, there was a significant difference in the sex ratio. Marital and employment status, and discharge place were also significantly different between two groups. On the other hand, the hospital day was significantly shorter in the elderly group (25.4 ± 11.0) than in the younger group (31.4 ± 13.9) (Table 1). In the elderly group, with traumatic SCI 60.4% non-traumatic SCI 39.6%, the proportion of non-traumatic SCI was higher than the young group (Traumatic SCI: 76.3%, Non-traumatic SCI: 23.3%) (Table 1). Falls were the most frequent etiology (56.3%), general falls predominated (50.0%) in the elderly group. In contrast, transport accidents (44.6%) was the main cause in younger groups. In non-traumatic causes, spinal stenosis (23.8%) was most frequent in elderly group (Table 2). The functional outcomes at discharge were improved in both groups compared to admission. In elderly group, K-MBI (29.3 ± 22.0) and SCIM II (33.0 ± 23.1) at admission point were lower than younger group. After rehabilitation, the elderly group showed greater improvement in the K-MBI (elderly group: 14.9 ± 13.4, young group: 10.2 ± 9.9) than the younger group. In addition, the SCIM II was significantly more improved in the elderly group (elderly group: 13.0 ± 15.7, young group: 6.7 ± 11.1) (Table 3).

Conclusions

The present findings showed that the elderly SCI patients differed from young SCI patients in the demographic characteristics, etiology and clinical features. Also, more intensive and adjusted rehabilitation therapy may be needed for the elderly SCI patients.

Table 1.Demographic characteristics and baseline values of participants

Variables	Age≥60	Age <60	*p*-value
Age (years)	68.3 ± 6.5	45.7 ± 11.6	0.000
Sex			
Male, n (%)	30 (55.6)	61 (83.6)	0.001
Female, n (%)	23 (43.4)	12 (16.4)	
Marriage			
Married, n (%)	45 (84.9)	48 (65.8)	0.000
Single, n (%)	1 (1.9)	23 (31.5)	
Other	7 (13.2)	2 (2.7)	
Employed			
Employed, n (%)	18 (34.0)	49 (67.1)	0.000
Non-employed, n (%)	35 (66.0)	24 (32.9)	
Month of injury			
January, n (%)	2 (3.8)	9 (12.3)	
February, n (%)	6 (11.3)	5 (6.8)	
March, n (%)	4 (7.5)	3 (4.1)	
April	7 (13.2)	5 (6.8)	
May	4 (7.5)	11 (15.1)	
June	5 (9.4)	3 (4.1)	0.299
July	6 (11.3)	9 (12.3)	
August	4 (7.5)	3 (4.1)	
September	4 (7.5)	10 (13.7)	
October	6 (11.3)	5 (6.8)	
November	1 (1.9)	6 (8.2)	
December	4 (7.5)	4 (5.5)	
Day of injury			
Monday, n (%)	7 (13.2)	8 (11.0)	
Tuesday, n (%)	5 (9.4	5 (6.8)	
Wednesday	8 (15.1)	13 (17.8)	0.899
Thursday	10 (18.9)	9 (12.3)	
Friday	10 (18.9)	14 (19.2)	
Saturday	8 (15.1)	16 (21.9)	
Sunday	5 (9.4)	8 (11.0)	
Duration since injury	34.5 ± 41.2	36.6 ± 44.1	0.79
Discharge place			
Private residence, n (%)	10 (18.9)	11 (15.1)	
Other hospital, n (%)	30 (56.6)	53 (72.6)	0.041
Sanatorium	7 (13.2)	1 (1.4)	
Other	6 (11.3)	8 (11.0)	
Hospital day	25.4 ± 11.0	31.4 ± 13.9	0.010
Bladder management			
Self, n (%)	31 (58.5)	40 (54.8)	
CIC, n (%)	4 (30.8)	9 (12.3)	0.682
Foley	18 (34.0)	24 (32.9)	
Surgery type			
No	11 (20.8)	9 (12.3)	
PIF	4 (7.5)	11 (15.1)	
Laminoplasty	4 (7.5)	6 (8.2)	
Laminectomy	21 (39.6)	18 (24.7)	0.245
Screw fixation	4 (7.5)	13 (17.8)	
Tumor resection	1 (1.9)	1 (1.4)	
Discectomy	8 (15.1)	13 (17.8)	
other	0 (0.0)	2 (2.7)	
Cause of injury			
Traumatic	32 (60.4)	56 (76.7)	0.049
Non-traumatic	21 (39.6)	17 (23.3)	
Level of injury			
Cervical	38 (71.7)	45 (61.6)	0.018
Thoracic	5 (9.4)	21 (28.8)	
Lumbosacral	10 (18.9)	7 (9.6)	
AIS grade			
A	1 (1.9)	11 (15.1)	
B	5 (9.4)	6 (8.2)	0.100
C	11 (20.8)	12 (16.4)	
D	36 (67.9)	44 (60.3)	

Table 2. Etiology of traumatic and non-traumatic SCI

Variables	Age≥60	Age <60	*p*-value
Traumatic SCI			
Transport accident, n (%)	11 (34.4)	25 (44.6)	0.517
Motorcycle	2 (18.2)	2 (8.0)	
Car	6 (54.5)	18 (72.0)	0.537
Other	3 (27.3)	5 (20.0)	
Slipping, fall, n (%)	18 (56.3)	23 (41.1)	0.517
General falls	9 (50.0)	17 (73.9)	
Fall from scaffolding	1 (5.6)	1 (4.3)	0.279
Fall from ladder	1 (5.6)	2 (8.7)	
Fall from own height	7 (38.9)	3 (13.0)	
Assault	0	0	
Diving	0	0	0.517
Sports injury	0	1 (1.8)	
Other	3 (9.4)	7 (12.5)	
Non-traumatic SCI, n (%)			
HIVD	1 (4.8)	4 (23.5)	
Spinal stenosis	5 (23.8)	0 (0.0)	
Neoplasm	4 (19.0)	6 (35.3)	
Abscess	1 (4.8)	0 (0.0)	0.087
Vascular origin	4 (19.0)	1 (5.9)	
Transverse myelitis	4 (19.0)	2 (11.8)	
syringomyelia	0 (0.0)	0 (0.0)	
Other	2 (9.5)	4 (23.5)	

Values are presented as the mean value ± standard deviation or number (%).

*p<0.05

Table 3. Functional outcomes

Variables	Age≥60	Age <60	*p*-value
Admission MBI	29.3 ± 22.0	38.6 ± 27.0	0.042
Admission SCIM	33.0 ± 23.1	42.7 ± 28.5	0.041
Admission WISCI	4.4 ± 6.7	5.4 ± 7.3	0.436
Discharge MBI	44.2 ± 24.2	48.7 ± 26.6	0.331
Discharge SCIM	45.9 ± 24.9	49.4 ± 28.4	0.470
Discharge WISCI	8.6 ± 8.4	8.5 ± 8.1	0.958
Changes of MBI	14.9 ± 13.4	10.2 ± 9.9	0.024
Changes of SCIM	13.0 ± 15.7	6.7 ± 11.1	0.009
Changes of WISCI	4.2 ± 5.7	3.2 ± 4.5	0.238

Values are presented as the mean value ± standard deviation or number (%).