

The Aspect of Cachexia and Weight Change following Rehabilitation Treatment in Spinal Cord Injury

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Introduction

Cachexia is a loss of lean tissue mass, involving a weight loss greater than 5% of body weight in 12 months or less. It is prevalent in most major diseases and is related with mortality and morbidity as well as poor quality of life. Many patients with spinal cord injury (SCI) experience rapid weight loss after injury, which might be associated with increased metabolic demand from severe trauma. Respiratory failure, decreased caloric intake related with swallowing difficulty and psychological factors may also contribute to weight loss after SCI. However, in these rehabilitation processes, the importance of weight management is frequently neglected. Therefore, this study aims to reveal the prevalence of cachexia in adults with SCI and weight changes and its associated factors following intensive rehabilitation therapy.

Methods

The medical chart of SCI patients who were admitted to tertiary university hospital for rehabilitation treatment from 2016 to 2017 was reviewed. Patients within 6 months after the onset, with available records of initial and follow-up body weight and body composition analysis by bioelectrical impedance were included. Finally 114 SCI patients were included. Patients were divided into 3 groups by disease chronicity: acute (≤ 2 weeks), subacute (between 2-8 weeks), and chronic (> 8 weeks). Participants were also classified into 3 groups based on the weight change after the injury by comparing body weight prior to and after the injury at admission. The groups were defined as follows: cachexia, weight loss $\geq 5\%$ body weight; precachexia, weight loss $< 5\%$, and no weight loss. The prevalence of cachexia and precachexia, weight change after rehabilitation and its associated factors were analyzed.

Results

About 60% of subacute (63.7%) and chronic (59.3%) SCI patients and 25.0% of acute SCI patient within 2 weeks after onset showed cachexia (Fig. 1). After an intensive rehabilitation treatment including nutritional care, cachexia group showed significant weight change (gain) compared to both precachexia and no-wt. gain groups ($p < 0.01$). In cachexia group, percentage of weight change (weight gain) was negatively associated with the initial body weight ($r = -0.412$, $p = 0.001$) and BMI ($r = -0.482$, $p = 0.000$), and significantly positive association with the percentage increase of skeletal muscle mass ($r = 0.370$, $p = 0.002$).

Conclusions

The percentage of cachexia was consistently high in all groups of SCI. These Results imply more concern on nutritional supplement is necessary in SCI patients depending on their metabolic demand in relation to physical condition and intensity of rehabilitation therapy. Further studies with more patients with various features of SCI injury (level, severity and chronicity) are necessary to demonstrate the risk factors of cachexia and related factors for better outcome.

Characteristics	Cachexia	Precachexia	No weight loss
Age	48.3±16.3	53.1±15.1	50.3±20.6
Sex (%)			
M/F	59/7(89.4/10.6)	12/5(70.6/29.4)	19/12(61.3/38.7)
Level of Injury (%)			
Tetra/Para	45/21(68.2/31.8)	11/6(64.7/35.3)	19/12(61.3/38.7)
ASIA(%)			
A/B/C/D	23/7/17/19 ^{††} (34.8/10.6/25.8/28.8)	6/2/4/5 (35.3/11.8/23.5/29.4)	5/0/7/19 (16.1/0.0/22.6/61.3)
Severity of injury			
Complete/Incomplete (%)	23/43(34.8/65.2)	6/11(35.3/64.7)	5/26(16.1/83.9)
Disease duration (day)	61.6±48.6	41.2±30.9	58.3±50.9
Disease chronicity			
Acute/Subacute/Chronic (%)	4/37/25(6.1/56.1/37.9)	3/11/3(17.6/64.7/17.6)	9/10/12(29.0/32.3/38.7)
Body weight (kg)			
Before injury	70.0±13.4	71.1±8.6	64.2±11.4
Initial at admission	62.3±11.5	68.8±8.5	66.4±11.3
F/U at discharge	63.8±11.1	68.3±8.9	64.9±10.6
Weight change			
After injury (kg)	-7.8±3.7	-3.3±0.4	+0.2±0.3
After injury (%)	-10.7±4.1 ^{**††}	-3.1±1.1 ^{††}	+3.6±3.9
After rehabilitation (kg)	+1.5±2.7 ^{**††}	-0.5±2.3	-1.5±3.9
After rehabilitation (%)	+2.7±5.1 ^{**††}	+0.7±3.5	-1.9±5.7
BMI			
Before injury	24.1±3.2 [†]	25.2±2.4 ^{††}	22.7±2.8
Initial at admission	21.5±2.9	24.4±2.3	23.5±2.7
F/U at discharge	22.0±2.6	24.2±2.3	23.0±2.5

p<0.05 compared with precachexia*, No-Wt loss[†]

P<0.01 compared with precachexia**, No-Wt loss^{††}

The demographic and clinical characteristics of participants

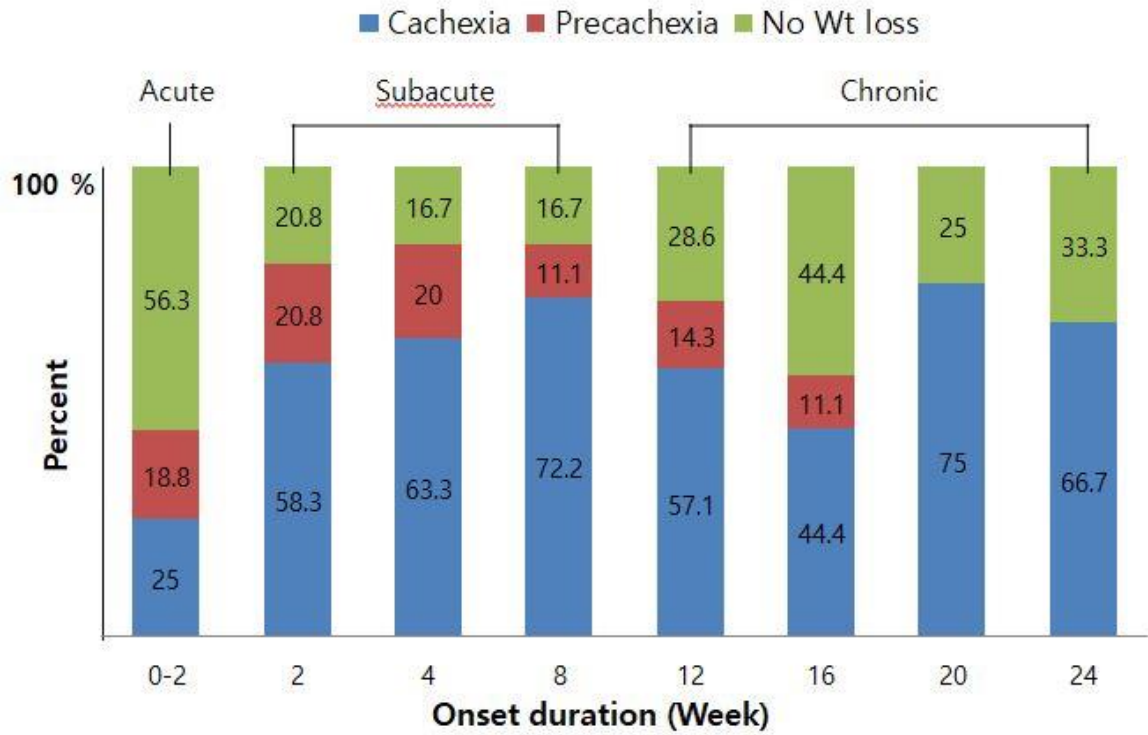


Fig 1. Frequency of cachexia and precachexia according to duration after the spinal cord injury