

Abstract

Effects of Treadmill Training on Hyperextension of the Knee and Cadence in Patients With Hemiplegia

Park Chul-hong, B.H.Sc., P.T.

Dept. of Physical Therapy, Seoul Su Medical Center

Chung Bo-in, Ph.D.

Dept. of Rehabilitation Therapy, Collage of Health Science, Yonsei University

Institute of Health Science, Yonsei University

This study addresses the effects of treadmill training on hyperextended knee and cadence in patients with hemiplegia. A single subject research design with multiple baselines across individuals was used for the study. Two patients with hemiplegia participated in the experiment. The experiment consisted of interventions where the patients were asked to ambulate for 15 minutes at a comfortable walking speed on the treadmill with 11% slope grade and were allowed to rest for 10 minutes. Patients, then, were asked to ambulated 20 meters at walkway. The number of occurrences of knee hyperextension and the total number of steps were recorded. The results showed that the occurrence of knee hyperextension decreased by approximately 30% after the first session of the treadmill training and continued to gradually decrease during the following sets of treadmill training. Meanwhile, there was a slight increase in the cadence to a negligible extent. These results suggest that the gait training on the sloped treadmill may be helpful for correcting the knee hyperextension in patients with hemiplegia.

Key Words: Treadmill training; Hyperextended knee; Cadence.

(muscle weakness), (abnormal muscle tone) (abnormal movement pattern) (Sharp Brouwer, 1997).

(gait velocity), (stride length), (stride width) (Brandstater, 1983)

(cadence), (step length), (Burridge, 1997).

(disability)가 (Duncan, 1994; Langton-Hower, 1990).

(stance phase) (Davis, 1985).

, 0 15° (Hassid, 1997; Hesse, 1999; Visintin, 1998). Waafjord (1990)가

(toe-off)가 (Hesse, 1999)가

(Sawner LaVigne, 1991).

가

가

가

1. Scale G1 Modified Ashworth 2

46

9

45

8

가

G1 (1).

2000 11 20 12 16

3 4

2. (single subject design) (multiple baseline across individuals design)

가. 2 3

6

가

가

20 m

가

500 m

Modified Ashworth

가 20 m

Scale G2

1.

	()	()	
1	46	9	G1
2	45	8	G1

15

가

100%

(%)

3.

(goniometer)

가

180°
micro-

(steps/min)

20 m
1 m

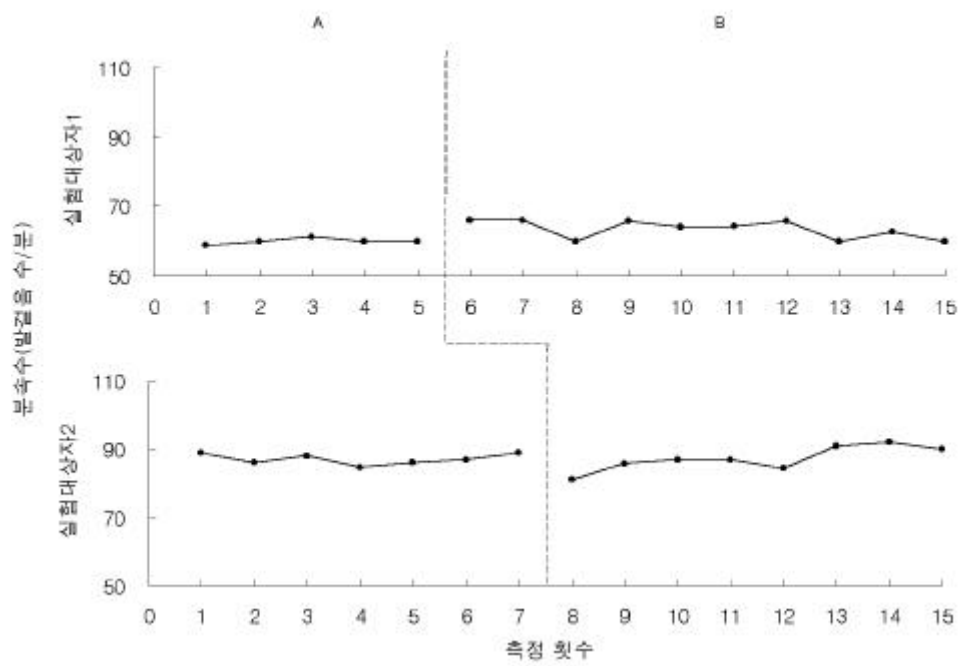
switch가

가

1

m

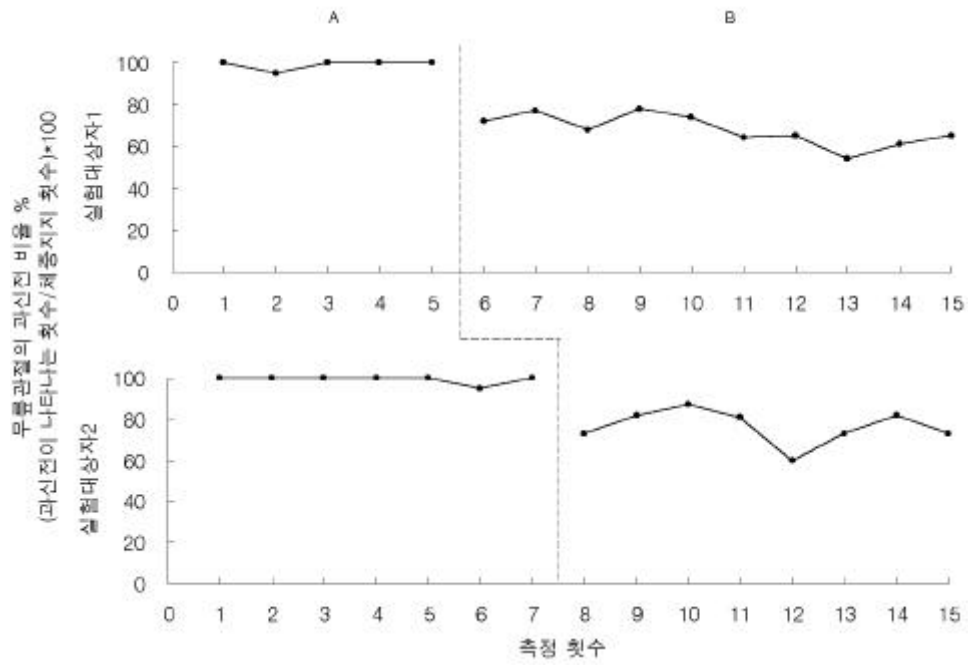
가



2.

2

(A: , B:)



1. 2
(A: , B:)

(sine) 100

11%

1

5

6

4.

Startrac
series. USA, 1997)

(ETL Co. Tr 4000

8
가

30

가

가

15
가

가

10

가

100 m

, 10%

5.

가

100 m

10 m

(visual analysis)

가

. Hesse (1999)

1 2

,

1

가

99.0%,

67.8%

2

99.3%,

. Winter(1989)

76.4%

2 2

,

(stepping),

1

60.0

steps/min,

63.4 steps

/min

2

87.2 steps/min,

87.3

steps/min

,

가

가

(Hassid

Knuttson Richards(1979)

, 1997).

가

(reciprocal innervation)

가

(Davies, 1990).

Sherrington(1913)

. Cipriani (1995)

10%

가

(initial contact)

가

가

가

Sherrington(1913)

가
 . 2
 1
 60.0 steps/min
 63.4 steps
 /min
 가
 가
 가
 가
 가
 가

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