

Comparison of the Self-selected to Maximal Levels of the Walking Index in Spinal Cord Injury (WISCI)



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BACKGROUND

Many individuals with SCI can ambulate with fewer adaptations than they typically do. WISCI is a capacity measure that describes and rates walking ability following SCI more precisely than conventional instruments. The objective of this study is to determine how often self-selected WISCI level (self-WISCI) differs from an individual's maximal level (max-WISCI), and compare gait efficiency and ambulatory velocity.

SUBJECT & METHOD

Fifty ambulatory individuals with traumatic motor incomplete SCI more than one year previously were enrolled. Subjects ambulated 100 meters or as far as possible, at the level utilized in the community (self-WISCI) and the highest level possible (max-WISCI). Continuous heart rate (HR) was collected. Levels were assigned by trained therapists. Ambulatory velocity (m/sec) = walking distance/the time lapsed, physiologic

cost index (PCI) = Δ HR/velocity, and total heart beat index (THBI) = THB/distance were calculated. Data from 36 subjects who had a higher max-WISCI than self-WISCI were analyzed to find differences between self and max-WISCI for velocity, PCI and THBI. Differences in parameters between self-WISCI and max-WISCI were compared using non-parametric paired t-test using SPSS Windows, 11th version.

RESULTS

Sex	Male 43, Female 7
Age	47.4 ± 13.2 yrs (range 21 ~ 72 yrs)
Level of Injury	Tetraplegia 28, Paraplegia 22

Those who have a higher max-WISCI than self-WISCI

	Velocity (m/sec)	PCI (beats/m)	THBI (beats/m)
Self-WISCI	0.68±0.29*	0.99±1.77*	3.39±0.57*
Max-WISCI	0.56±0.31	1.48±3.42	4.75±1.24

*P<0.05

CONCLUSION

Most subjects were able to walk at a higher WISCI level than their usual level, that is, with less use of devices and/or physical assistance. For these individuals, ambulation at the self-WISCI appeared to be more efficient as evidenced by greater velocity and lower energy cost. These findings have implications for assessing changes in ambulation in clinical trials.

REFERENCE

Hood VL, Granat MH, Maxwell DJ, Hasler JP: A new method of using heart rate to represent energy expenditure: The total heart beat index. Arch Phys Med Rehabil 83:1266-1273, 2002.

WISCI SCORING SHEET

LEVEL	DEVICES	BRACES	ASSISTANCE	DISTANCE
0	Patient is unable to stand and/or participate in assisted walking			
1	Parallel Bars	Braces	2 persons	< 10 meters
2	Parallel Bars	Braces	2 persons	10 meters
3	Parallel Bars	Braces	1 person	10 meters
4	Parallel Bars	No Braces	1 person	10 meters
5	Parallel Bars	Braces	No assistance	10 meters
6	Walker	Braces	1 person	10 meters
7	Two Crutches	Braces	1 person	10 meters
8	Walker	No Braces	1 person	10 meters
9	Walker	Braces	No assistance	10 meters
10	One Cane/Crutch	Braces	1 person	10 meters
11	Two Crutches	No Braces	1 person	10 meters
12	Two Crutches	Braces	No assistance	10 meters
13	Walker	No Braces	No assistance	10 meters
14	One Cane/Crutch	No Braces	1 person	10 meters
15	One Cane/Crutch	Braces	No assistance	10 meters
16	Two Crutches	No Braces	No assistance	10 meters
17	No Devices	No Braces	1 person	10 meters
18	No Devices	Braces	No assistance	10 meters
19	One Cane/Crutch	No Braces	No assistance	10 meters
20	No Devices	No Braces	No assistance	10 meters

FIGURES

