Spinal cord injured women treated with Lokomat® Robot

Considerations for improved treatment effectiveness

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Introduction.-

Spinal cord injury (SCI) is more prevalent and has a higher incidence in males. So, few specific studies about SCI in women are available, specially if functional results are considered .

Lokomat System (LS) is based on partial body weight discharge associated to a treadmill and a robotic device that reproduces mobilization of inferior extremities. LS is included in the group of gait re-education techniques that promote neuronal plasticity. Its mechanism of action is intended to provide an accurate sensitive input to the damaged nervous system in order to stimulate remaining medullar networks and to promote a continuous participation, even if above lesion input is harmed. **(Spinal cord is able to learn)**

Purpose.-

To know **functional** and epidemiologic characteristics of women that have undergone treatment program with Lokomat System® and to determinate the best moment for this therapy.

Method.-

A prospective study on consecutive women admitted in authors´ institution diagnosed of incomplete spinal cord injury (ISCI) from C1 to T12 and less than 6 months of evolution.

Exclusion criteria

Complete SCI / More than 6 months of evolution / Unstable fracture / Severe bronchial or cardiac pathology / Severe osteoporosis / Pressure ulcers / Arthropaty or flexion deformities / Dismetry > 2 cm / Weight > 150 kg or Height > 2m

Intervention

Forty 30-minute sessions, 5 days per week, beginning with a discharge of 60% of body weight and in a comfortable speed for the patient.

Outcome measures:

Demographic and lesion data / Lower extremity muscle strength (LEMS) / SCIM II (Spinal cord independence measure) / FIM (Functional independence measure) / WISCI II (Walking Index Spinal Cord Injury) Test 10m / Test 6´ / Up and Go / EuroQol 5D (percepción de calidad de vida)

Statistical analysis was performed with program SPSS 17, with monovariant study of means and frequencies and bivariant with x²- Paired means and independent means comparison ANOVA 1 factor . P<0,05

Results.-

N: 64
Mean age: 44 years (SD10)
Time of evolution: 109 days (SD57)

No significative differences were found when age and improvement after treatment were analysed (reference age: 65 and 70 years)

Before	After treatment	Mean	Std. Deviation	p
Pair 1	LEMS - f_LEMS	-8,10938	6,17244	,000
Pair 2	WISCIII - fWISCIII	-6,66667	5,97116	,000
Pair 3	10m - f10m	2,79538	36,87551	,702
Pair 4	seis – f_seis	-56,50333	73,74744	,001
Pair 5	upandgo - f_upango	-6,91667	47,58506	,736
Pair 6	i_FIM - f_FIM	-17,12727	14,64399	,000
Pair 7	FIM_I - f_FIM_I	-3,43636	3,11961	,000
Pair 8	SCIM- f_SCIM	-17,13333	14,84863	,000
Pair 9	SCIM_mov - f_SCIM_mov	-7,46667	6,80441	,000
Pair 10	Euroq100 - f_Euroq100	-11,692	25,510	,007

	Etiology	N	Mean (SD)	p
LEMS	Traumatic	18	6.1 (7.0)	>0.05
	Medical	45	8.7 (6.0)	
WISCI II	Traumatic	15	7.6 (6.3)	>0.05
	Medical	37	8.4 (5.4)	
6 min	Traumatic	12	67.5 (73.5)	0.034
	Medical	36	128.7 (121.6)	
Up-go	Traumatic	7	34.7 (35.0)	>0.05
	Medical	22	34.9 (29.6)	
FIM	Traumatic	15	14.3 (12.0)	0.04
	Medical	43	16.8 (15.7)	
SCIM	Traumatic	13	11.6 87.9)	0.02
	Medical	35	17.5 (16.6)	
EQ5D	Traumatic	12	.71(.2)	>0.05
	Medical	34	.64(.2)	

	Evolution time	N	Mean (SD)	p
LEMS	> 90 días	37	7.4 (7.5)	>0.05
	< 90 días	26	8.4 (4.0)	
WISCI II	> 90 días	31	5.9 (4.4)	0.01
	< 90 días	22	11.1 (5.7)	
6 min	> 90 días	27	68.8 (93.8)	0.01
	< 90 días	20	174.4 (115.5)	
Up-go	> 90 días	12	24.3 (29.1)	>0.05
	< 90 días	16	42.1 (30.7)	
FIM	> 90 días	31	12.6 (11.7)	0.01
	< 90 días	28	20.1 (16.7)	
SCIM	> 90 días	23	12.0 (12.9)	>0.05
	< 90 días	25	19.1 (15.5)	
EQ5D	> 90 días	23	0.7 (0.2)	>0.05
	< 90 días	23	0.6 (02)	

Conclusions.-

An improvement in inferior extremities strength, functional independence, gait ability and quality of life perception has been found in women treated with LS after 2 months of treatment. Every analysed variable has improved despite patient age. Better results for daily life activities independence and gait resistance can be obtained in patients with non-traumatic SCI. **Patients that begun treatment less than 3 months after lesion obtained better results in the speed test and in FIM-L.**

References:

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