뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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Feasibility test of SMART pegboard regarding upper extremity rehabilitation after stroke

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Objective

Pegboard training has been used for traditional upper limb rehabilitation, but the monotonous therapeutic characteristic prevents repetitive training. We developed the SMART pegboard (Neofect, Seongnam, Korea), adopting a gamified approach on the conventional pegboard and providing various upper limb training programs to increase the patients' motivation. The present pilot study aimed to assess the clinical feasibility of this newly developed rehabilitation apparatus device, the SMART pegboard for the upper limb training.

Methods

This study was an experimental pre-post design and conducted in a single rehabilitation hospital. The SMART pegboard training programs consist of 15 programs, the patients were received various rehab training properly according to individuals' level and status. The primary outcome was changed in the Fugl–Meyer assessment (FMA) score, and the secondary outcomes were changes in the Box and Block Test (BBT) score, and Jebsen-Taylor Hand Function Test (JTHFT) score. Evaluations were conducted twice before and after the intervention. The paired t-tests were used as the statistical methods for comparisons of repeatedly measured clinical scales. In addition, the usability test was performed to reflect the participants' satisfaction for the device.

Results

Nineteen hemiplegic stroke patients were participated and included in the analysis. All functional outcome measurements (FMA, BBT, and JTHFT) showed very significant improvements ($p < 0.001$) after the intervention which indicating that the great improvement in upper extremity functions including both proximal and distal parts. Also, the usability test showed high satisfaction with 4.9 out of 5 points, with the highest score being in the effects of recovery. The additional opinions for the intervention with the SMART pegboard were that the various programs encouraged the participation in rehabilitation and the level was appropriately challenging.

Conclusions

The SMART pegboard was a feasible intervention device for improving upper limb function. The SMART pegboard, providing training routines composed of functional game factors, would effectively reduce the burden of therapists while continually giving the patients motivation for rehabilitation. However, a further study which compares the conventional pegboard or conventional occupational therapy might be needed.

Table 1. Demographic characteristics of study subjects

Variable¶	n (%)	Variable	Mean ± SD
Sex : male	16 (84.2)	**Age (year)**	51.2 ± 8.6
Female	3 (15.8)		
Affected side : left	9 (47.4)	**Time from s8troke**	43.4 ± 53.7
Right	10 (52.6)	**(month)**	

¶*Values are mean ± SD (Standard Deviation), n (%)*

Table 2. Performance changes of study subjects using paired t-test

Variables¶ (n = 19)	Pre test	Post test	P - value	95% CI
Box and Block	21.9 ± 13.7	26.7 ± 15.8	<0.0001***	(-7.057495, -3.075839)
FMA_total	49.8 ± 12.6	54.8 ± 11.2	<0.0001***	(-7.031132, -3.902202)
FMA_proximal	28.8 ± 6.7	30.9 ± 5.9	<0.001**	(-3.629545, -1.303788)
FMA_distal	18.1 ± 5.7	20.1 ± 5.4	<0.001**	(-3.238256, -1.028410)
FMA_coordination	2.9 ± 1.6	3.8 ± 1.5	<0.001**	(-1.3736401, -0.3596933)
JTHFT_time	377.1 ± 277.2	325.9 ± 264.0	<0.001**	(23.13113, 81.14754)
JTHFT_score	21.7 ± 18.6	27.3 ± 23.1	<0.001**	(-7.753253, -2.913413)
JTHFT_gross	6.5 ± 6.3	7.6 ± 7.3	0.077	(-2.4558088, 0.1400193)
JTHFT_fine	15.3 ± 13.1	19.7 ± 16.2	0.001*	(-6.827308, -2.014797)

¶*Values are mean ± SD(Standard Deviation), CI (Confidence Interval)*