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Efficacy of intensive therapy program using therasuit method for pediatric rehabilitation patients

Seong Min Chun[1*], Ji Soo Choi[1], Hana Kim [1], Sujin Doo[1], Yeaeun Kim[1], Jung-Hee Doo[1], Jiyeon Hong[1†]

PURME Foundation NEXON Children`s Rehabilitation Hospital, Department of Rehabilitation Medicine[1]

Introduction

Pediatric patients with CP or other brain injuries demonstrate problems with body functions and structures, such as altered balance control, poor alignment, reduced muscle strength, and limited joint range of motion. Intensive therapy program using therasuit method (ITP) is a stretching and strengthening program based on individual`s level and need, during which the patient wears therasuit. Use of therasuit may able to modify joint alignment and reinforce certain muscle groups. However, evidence indicating functional benefit from participation in ITP is limited. In this study, the authors compared changes in gross motor function, balance parameters, and activities of daily living in pediatric patients with CP and other brain injuries who received ITP and conventional in-patient NDT therapy.

Method

Five patients participated in the pilot study. All patients had no history of newly developed neurological problems, musculoskeletal disorders, or botulinum toxin injections in the previous 6 months. Three patients were diagnosed with cerebral palsy, two patients were diagnosed brain tumor and intracranial hemorrhage, respectively. Each patient received in-patient NDT therapy for a period of 12 weeks, 5 times per week, in three half hour sessions per day. After a period of time, same patients admitted again and underwent ITP for a period of 8weeks, 5 times per week, in a one and half hour session per day. ITP included multiple movements combined with the wearing of a fitted suit, which provided resistance during activity. In addition, Each patient`s therapeutic program was individualized with the goal of advancing the patient to the next level of function or physical activity. Two major differences between ITP and in-patient NDT therapy were as follows: (1) one continuous session versus three intermittent sessions, (2) using therasuit and universe exercise unit versus no additional device. Outcome measures were gross motor function measure (GMFM-88), pediatric balance scale (PBS), functional independent measure (FIM). Outcome measures were assessed at admission and before discharge. Changes on the GMFM, PBS, FIM were compared between ITP and in-patient NDT therapy.

Results

Demographic characteristics of the five patients were provided in table 1. Duration of ITP was shorter than that of in-patient NDT therapy (48 days versus 92.4 days). All outcome measures improved in both therapies. Changes of GMFM score were 6.86% after ITP, 5.59% after in-patient NDT therapy. Changes of PBS score were 7.4 after ITP, 4.0 after in-patient NDT therapy. Changes of FIM were 4.8 after ITP, -0.6 in in-patient NDT therapy (Table 2).

Conclusion

This pilot study shows that the effect of ITP outweighs those of in-patient NDT therapy, especially on balance function. Follow-up study should be performed to demonstrate statistically significant difference between the therapies.

Acknowledgment

The study claims no conflicts of interest.

Table 1. Demographic data of five patients

	Sex	Age	Diagnosis	Duration of disease (Days)	GMFCS (Level)
Patient 1	Male	11	Athetoid CP		2
Patient 2	Female	6	Ataxic CP		1
Patient 3	Male	11	Brain tumor	902	
Patient 4	Female	7	ICH	207	
Patient 5	Male	6	Diplegic CP		1

Table 1. Demographic data of five patients

Table 2. Data of outcome measures

	ITP	in-patient physical therapy
GMFM_pre	79.5%	77.1%
GMFM_post	86.4%	82.7%
PBS_pre	32.8	33.3
PBS_post	40.2	37.3
FIM_pre	83.0	77.6
FIM_post	87.8	77.0

Table 2. Data of outcome measures