

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/333372923>

EFFECTS OF SELECTIVE PERCUTANEOUS MYOFASCIAL LENGTHENING AND FUNCTIONAL PHYSIOTHERAPY ON MOBILITY IN CHILDREN WITH CEREBRAL PALSY: A NON-RANDOMIZED CONTROLLED TRIAL

Poster · May 2019

DOI: 10.13140/RG.2.2.16578.84160

CITATIONS

0

READS

44

5 authors, including:



Vasileios C Skoutelis

National and Kapodistrian University of Athens

24 PUBLICATIONS 1 CITATION

SEE PROFILE



Stamatis Vrettos

5 PUBLICATIONS 2 CITATIONS

SEE PROFILE



Effects of Selective Percutaneous Myofascial Lengthening & Functional Physiotherapy on Mobility in Children with Cerebral Palsy: a Non-Randomized Controlled Trial



Vasileios C. Skoutelis¹, Anastasios Kanellopoulos², Stamatis Vrettos³, Efstratia Kalamvoki⁴, Vasileios Kontogeorgakos^{1,5}

¹Medical School, National & Kapodistrian University of Athens, Greece; ² Orthopedic Centre, *Iaso* Children's Hospital, Greece; ³E-N-A pediatric physiotherapy centre, Greece;

⁴*Paidokinisi* pediatric physiotherapy centre, Greece; ⁵First Department of Orthopedics, *Attikon* General University Hospital, Greece

Introduction

Spastic cerebral palsy (CP) is characterized as “*short-muscle disease*” because of the progressive development of musculotendinous contractures, between the age of 5 to 8 years.

Preexisting weakness and secondary fixed contractures affect the mobility of children, by discontinuing the gross motor development, or even declining motor capacity from the age of 7 years. Thus, muscle lengthening surgery is commonly inevitable and indispensable.

Selective percutaneous myofascial lengthening (SPML) procedure is a novel, minimally invasive surgery, typically combined with alcohol nerve blocks, which enables immediate strengthening physiotherapy programme.¹

Functional physiotherapy (FPT) is a task-specific strength training approach through functional activities, with family/parent involvement.²

However, reports about effects of SPML procedure combined with functional physiotherapy on gross mobility in children with CP are limited.

Purpose

To investigate the effectiveness of SPML procedure and post-surgical functional physiotherapy on gross mobility in school-aged children with CP.

Participants

Inclusion Criteria

- ➔ spastic uni/bilateral CP
- ➔ 5-7 years
- ➔ GMFCS levels II-IV
- ➔ Normal/good cognition
- ➔ Hip ext str > *grd* 2

Exclusion Criteria

- ➔ BoNT-A within last 6 months
- ➔ Previous orthopedic procedure
- ➔ Need for concomitant osteotomy

Methods

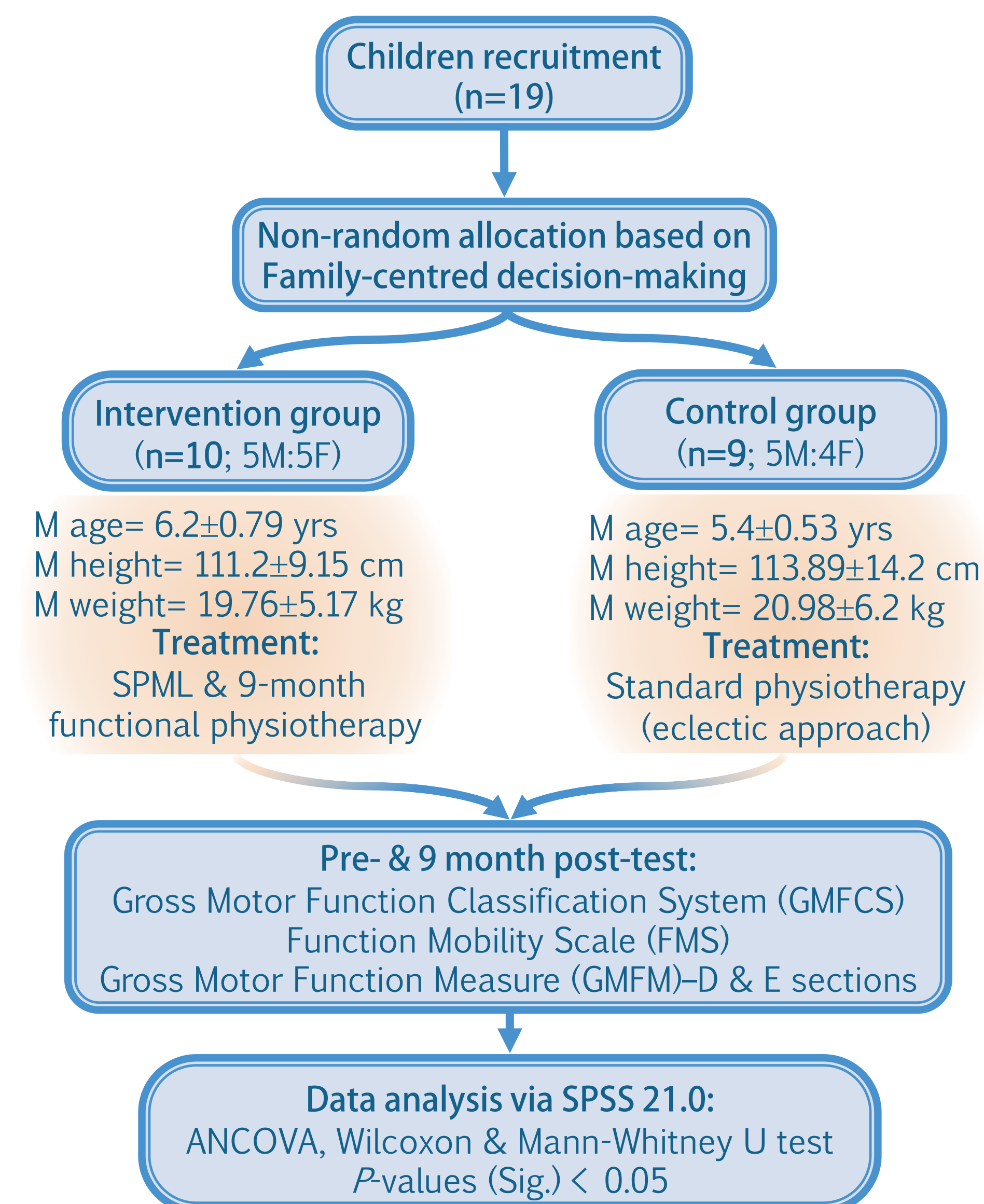


Figure 1 • Flow diagram of the study.

Results

Statistical analysis revealed that the children underwent SPML and functional physiotherapy presented significantly higher improvement in D and E dimensions of the GMFM, compared to control children ($p<0.05$, $\eta^2=0.26-0.33$).

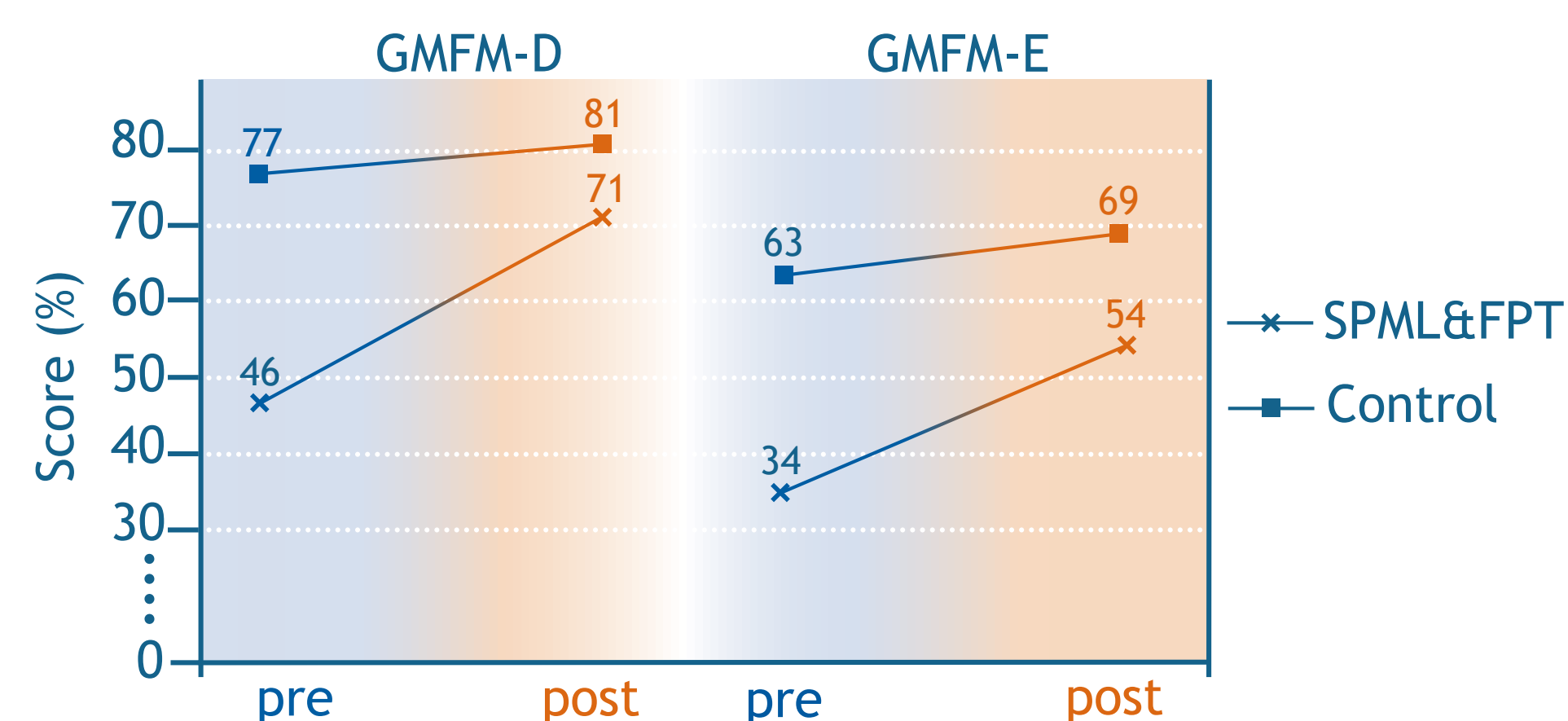








Figure 2 • Mean GMFM dimensions D & E scores before & after 9 months of intervention.

Results

The ratings in the GMFCS and FMS for each distance (5, 50 and 500 metres) were significantly improved in children received SPML procedure and functional physiotherapy ($p<0.01$), but not in the control children ($p>0.05$).

The comparison of the pre-post differences in the GMFCS and each FMS distance between the groups also demonstrated a significantly better improvement for the intervention compared to the control group ($p<0.001$).

FMS			6	5	4	3	2	1
								
FMS 5m	SPML & FPT	pre		3	2	1	4	
		post	3	4		3		
	Control	pre	1	7		1		
		post	1	7		1		
FMS 50m	SPML & FPT	pre		1	2	2	1	4
		post	3	1	3	1	2	
	Control	pre		6	2	1		
		post		7	1	1		
FMS 500m	SPML & FPT	pre		1	2	1		6
		post	3		4	1	1	1
	Control	pre		5	2	1		1
		post		5	2	1		1

GMFCS			I	II	III	IV	V
	SPML & FPT	pre		3	5	2	
		post	3	4	3		
	Control	pre		8	1		
		post		8	1		

Figure 3 • Changes in Functional Mobility Scale (FMS) & Gross Motor Function Classification System (GMFCS) between the intervention (SPML & FPT) & control groups.



Figure 4 • Motor status & progress of a child following SPML procedure & 9-month post-surgical functional physiotherapy.

Clinical Implications

The findings of this study bring a new prospect in the management of children with spastic CP.

This combination of SPML and functional physiotherapy seems to break the deadlock the clinicians often face for overcoming the plateau or decline of gross motor development in children with CP.

Conclusions

To our knowledge, this is the first controlled trial of SPML combined with functional physiotherapy.

This study provides preliminary evidence that SPML procedure and 9-month functional physiotherapy promotes the gross motor function in children with spastic CP, by increasing the degree of independent mobility.

Further investigation is currently in progress, with a larger sample size, to confirm these results.

References

1. Skoutelis V.C., Kanellopoulos A., Vrettos S., Gkrimas G., Kontogeorgakos V. Improving gait and lower-limb muscle strength in children with cerebral palsy following selective percutaneous myofascial lengthening and functional physiotherapy. *NeuroRehabilitation* 2018, 43(4): 361-368
2. Skoutelis V.C., Dimitriadis Z. The evolution of physiotherapy in the clinical management of children with cerebral palsy: A functional approach. *Arch Hell Med* 2016, 33(4): 532-541

Ethics Approval

Approved by the Scientific Council of the *Attikon* University General Hospital, Greece
(EBA 2199/14-03-2017)

Presented at the **WCPT CONGRESS 2019**, Geneva, Switzerland

Contact details: vskoutelis@gmail.com
Further information: www.kids2walk.com

