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## Purpose of the study

The overall aim of the study was to establish grip strength parameters, such as maximal grip strength, muscle coordination and muscle endurance of young adults with unilateral CP in relation to those of healthy subjects and to determine relations to performance of functional activities of the upper extremity.

## Subjects

26 healthy subjects and 26 young adults with unilateral CP, without severe learning disabilities.

Table 1. Characteristics of the subjects

	CP patients	Controls	p-value
Age (years)	20.6 (1.2)	21.6 (4.2)	0.18
Weight (kg)	66.2 (8.3)	69.1 (11.1)	0.29
Height (cm)	174.9 (8.7)	177.1 (9.5)	0.40
GMFCS I	100%		
MACS I	88%		

## Measurements

A Lode handgrip dynamometer (handle position 2) was used, which is similar to a Jamar dynamometer. Both hands were tested and each task was first performed with the dominant or uninvolved hand.

In the young adults with CP, functional activities were measured using a modified Melbourne assessment and the Abilhand Questionnaire.

## Analysis

Differences were determined by paired t-tests; differences between the patients and healthy subjects with independent-samples t-test. Relations between the grip strength parameters and the functional activities of the upper extremity were investigated using Pearson correlation coefficients.

## Results

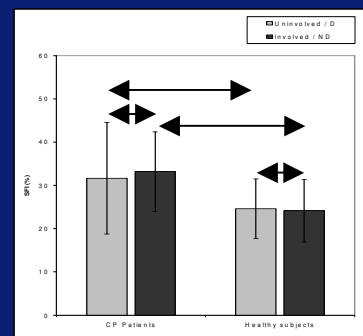
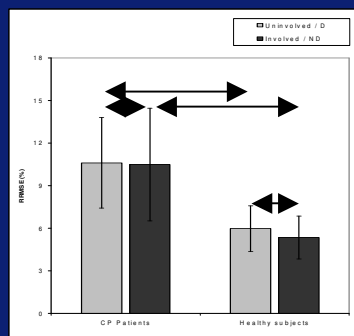
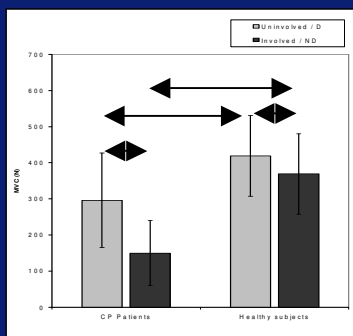


Figure 1. Mean values and standard deviation of the maximal grip strength, muscle coordination and muscle endurance of the healthy subjects and the patients with CP.

Table 2. Pearson correlation coefficients

	MVC	RRMSE	SFI	Melbourne	Abilhand
MVC	-	- 0.36	0.06	<b>0.63</b>	0.35
RRMSE		-	0.02	- 0.20	<b>- 0.45</b>
SFI			-	0.25	0.23
Melbourne				-	<b>0.49</b>
Abilhand					-

Printed in bold = statistically significant; MVC = maximal voluntary contraction; RRMSE = relative root mean square error; SFI = static fatigue index.

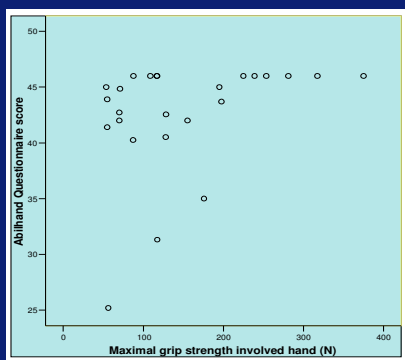


Figure 2. Scatterplot of the maximal grip strength and the score of the Abilhand Questionnaire.

## Conclusions

- all grip strength parameters of the uninvolved hand were reduced compared to healthy subjects
- in young adults with unilateral CP only maximal grip strength of the involved hand is reduced
- correlations between the grip strength parameters and limitations in functional activities were not linear