



Objective

● Aim of this study

- To determine the appropriate amount of comprehensive rehabilitation program for improvement of physical function and activities of daily living in children with cerebral palsy (CP)

Methods

● Subjects

- 73 children with CP between the ages of 2 and 12
- Retrospective study

● Comprehensive rehabilitation treatment

- consisted of 30 minutes of exercise therapy, 30 minutes of instrument therapy, and 30 minutes of occupational therapy

● Low amount group (n=41)

- Underwent a comprehensive rehabilitation program once a day for a total of 90 minutes for 2 months at the outpatient rehabilitation center

● High amount group (n=32)

- Admitted to the rehabilitation center of the general hospital and received a comprehensive rehabilitation program for 2 months, 5 times a week for a total of 180 minutes twice a day

● Evaluation of developmental status

- Gross Motor Function Measure-88 (GMFM-88)
- Functional Independence Measure for Children (WeeFIM)
- Quality of Upper Extremity Skills Test (QUEST)
- at the beginning and the end of the two-month comprehensive rehabilitation program

Results

Table 1. Demographic data of the children with CP

	Low amount group (n=41)	High amount group (n=32)	Total (n=73)
Age (month)	5.13±2.35	4.39±1.58	4.81±2.07
Group			
Under 36 months	11	5	16
Over 36 months	30	27	57
Gender			
Male: Female	28:13	18:14	46:27
GMFCS			
II	6	6	12
III	9	12	21
IV	19	4	23
V	7	10	17
Type			
Spastic diplegic	15	14	29
Spastic hemiplegic	4	6	10
Spastic quadriplegic	15	12	27
Dyskinetic	7	0	7
Ambulatory	15	18	33
Ambulatory			
Non-ambulatory	26	14	40
GMFM	56.82±24.01	47.87±30.67	52.97±27.24
WeeFIM	34.63±21.61	36.16±18.23	35.30±20.08
QUEST	63.73±19.94	69.29±17.80	66.01±19.05

GMFCS: Gross Motor Function Classification System, GMFM-88:Gross Motor Function Measure-88, WeeFIM: Functional Independence Measure for Children, QUEST: Quality of Upper Extremity Skills Test

Table 2. Comparisons of the improvement of GMFM-88, WeeFIM and QUEST between low and high amount groups

		Low amount group (n=41)	High amount group (n=32)	Total (n=73)	P value
GMFM	Total	4.73±4.18	5.24±4.03	4.95±4.09	0.47
	A	2.01±4.43	4.55±7.26	3.12±5.93	0.07
	B	4.92±8.79	3.55±4.23	4.32±7.16	0.97
	C	5.36±9.41	5.19±7.21	5.29±8.46	0.90
	D	7.44±9.78	8.01±9.84	7.69±9.74	0.88
	E	3.92±7.19	5.33±8.64	4.54±7.83	0.88
WeeFIM	Total	0.37±3.05	1.25±2.17	0.76±2.71	0.08
	QUEST	3.40±3.84	4.76±3.92	3.97±3.88	0.19
QUEST	A	0.50±2.01	1.86±5.65	1.07±3.96	0.10
	B	4.21±9.72	5.55±5.41	4.77±8.12	0.12
	C	2.82±5.61	2.25±4.43	2.58±5.09	0.40
	D	6.06±10.49	9.37±10.92	7.45±10.65	0.35

GMFM-88:Gross Motor Function Measure-88, WeeFIM: Functional Independence Measure for Children, QUEST: Quality of Upper Extremity Skills Test.

Table 3. Comparisons of the improvement of GMFM-88, WeeFIM and QUEST between low and high amount groups in ambulatory children with CP

		Low amount group (n=15)	High amount group (n=18)	Total (n=33)	P value
GMFM	Total	3.31±3.65	6.13±3.47	4.77±3.81	0.01*
	A	0.00±0.00	1.42±3.14	0.77±2.40	0.29
	B	0.44±0.99	3.52±4.91	2.12±3.96	0.13
	C	1.27±2.97	5.95±6.94	3.82±5.92	0.01*
	D	6.33±7.74	11.97±9.43	9.40±9.03	0.09
	E	7.68±10.43	7.79±9.09	7.74±9.57	0.96
WeeFIM	Total	1.07±4.59	1.89±2.56	1.51±3.59	0.33
	QUEST	2.93±3.57	5.04±4.11	4.07±3.94	0.15
QUEST	A	0.91±2.70	2.12±6.02	1.56±4.74	0.37
	B	5.25±10.77	5.29±4.97	5.27±7.99	0.40
	C	1.17±2.76	2.43±4.72	1.85±3.92	0.25
	D	4.40±5.36	10.31±11.34	7.58±9.41	0.35

GMFM-88:Gross Motor Function Measure-88, WeeFIM: Functional Independence Measure for Children, QUEST: Quality of Upper Extremity Skills Test.

- No significant difference in GMFM, WeeFIM and QUEST between low and high amount groups

- In the ambulatory children with CP

- total and C dimensions of GMFM-88 score : significantly improved in the high amount group compared with the low amount group (p=0.01)

- In the non-ambulatory children with CP

- A dimension of GMFM-88 score was improved (p=0.01)

- however, D dimension of GMFM-88 score: worsening (p=0.02) in high amount group

Discussion

- The high amount comprehensive rehabilitation might benefit gross motor function in ambulatory children with CP