

The impact of kinetotherapy in the improvement of functional capacity and self care of children with Sechelar Infantile Encephalopathy

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Abstract

The purpose of the study was to demonstrate the efficiency of kinetotherapy in the treatment of sechelar infantile encephalopathy (SIE). Methods: we studied 10 children with sechelar infantile encephalopathy, which were admitted in the Recovery Clinical Hospital in Băile Felix. They were submitted to a specific kinetotherapy program for one year. All subjects were assessed before and after this physical intervention. Results: following this application we obtained good results; all patients showed an improvement both in motion and respiratory abilities – inhaling and exhaling. The conclusion of this study was that this treatment proved to be very efficient, in improving functional and self-care capacities of SIE patients.

Key words: *sechelar infantile encephalopathy, kinetotherapy, functional and self care capacities.*

Rezumat

Scopul acestui studiu a fost demonstrarea eficienței kinetoterapiei în encefalopatia sechelară infantilă. Material și metodă: În lucrarea de față am luat în studiu un număr de 10 copii cu encefalopatie sechelară infantilă, care au fost internați la Spitalul de Recuperare din Băile Felix. Toti subiectii au fost supuși metodelor de kinetoterapie pe o perioada de 1 an fiind evaluați atât înaintea începerii programului de recuperare cât și la sfârșitul lui. Rezultate: În urma aplicării programului de kinetoterapie am obținut rezultate bune, pacienții obținând îmbunătățirea capacității motrice și a celei respiratorii – inspir și expir. Concluzia acestei lucrări este că în urma procedurilor de terapie aplicate, capacitatea funcțională și de autoîngrijire a persoanelor cu ESI s-a ameliorat.

Cuvinte cheie: *encefalopatia sechelară infantilă, kinetoterapie, capacitatea funcțională și de autoîngrijire.*

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Introduction

An essential thing a future mother can provide to her unborn child is the practice of physical exercise. For the maintenance of the body's harmony it's essential for the pregnant women to practice outdoor activities as much as possible. But also, medical gymnastics is important, providing some assistance in the actual birth (1).

After much participation in the practical programmes of the Recovery Clinical Hospital in Baile Felix – children's section, I've come to the following conclusions: I expect that the following kinetotherapeutic methods as FNP, stretching and hydrostretching, Bobath ball, to be more efficient than the means used in the classical kinetotherapeutic programmes.

Table I. Control group – patients presentation

No.	N. S.	Sex	Age (years)	Birth (months)
1	C.M.	F	3	7
2	F.A.	F	5	6
3	P.V.	F	4	7
4	N.D.	M	3	7
5	O.F.	M	3	6
Average:			3.6	6.6

Table II. Experimental group – patients presentation

No.	N. S.	Sex	Age (years)	Birth (months)
1	R.C.	M	3	7
2	R.A.	M	5	7
3	B.F.	F	5	6
4	S.A.	F	4	7
5	C.A.	F	5	6
Average:			4.4	6.6

Material and method

The study was made in the Recovery Clinical Hospital in Baile Felix – children's section from the climacteric spa 1 Mai in the following period 08.04.2007-20.04.2008, and was composed of two

groups of subjects. The control group (5 patients) with ages ranging from 3 to 5 years followed physiotherapy and physical exercises. The experiment groups (5 patients) with ages ranging from 3 to 5 years were under classical physical treatment and breathing exercises. All subjects were diagnosed with spastic tetraparesis.

As you can notice from table I and II the studied lots are homogeneous as:

- Diagnosis
- Age (averages being 3.6 years for the reference lot and 4,4 years for the experimental lot)
- Sex (3 girls and 2 boys in every lot)
- Birth month (averages being 6.6 in every lot).

Each subject was evaluated at the beginning of the physical kinetic program, at the beginning of April 2007.

Another evaluation was made after 6 months and the last at the end of the program in May 2008.

To evaluate the neuromotor outcome we used the following scale:

- 0 – the posture (movement) cannot be obtained;
- 1 – the posture (movement) can be obtained passively, but it cannot be maintained or made by the patient alone;
- 2 – the posture (movement) can be maintained if the patient was seated initially in it, the movement is passive-active;
- 3 – the patient can obtain the test posture (movement), but it's made unnaturally ;
- 4 – the posture (movement) can be obtained actively with minimum help;
- 5 – the posture (movement) is executed normally.

Assessment of cardiopulmonary system of each patient included the measure of his respiratory frequency and pulse before starting the exercise program, after finishing and 5 minutes after the end of program. The pulse is an indicator of the patient's health status, orienting about the therapy.

Also we evaluated the respiratory capacity (exhaling and inhaling) as follows:

- For the evaluation of inhaling capacity we used a special device – spirometer. The patient introduces the pipe into his mouth and pushes the device's ball as up as he can and keeps it there. The device has different graduations of difficulty. This measurement is a good test for the resistance of the respiratory flux.
- For the evaluation of the exhaling resistance we used a ping pong ball. The patient is asked to sit and to blow slowly and continuously towards the ball which is put on the table in front of him, with two pillows on the sides to prevent it from falling down. We can appreciate the exhaling capacity of the patient by measuring the length from the starting point until the stopping point.

All patients underwent a kinetotherapy program on a 12 month period. The objectives were: control of spasticity, obtaining of segment relaxation, obtaining of volunteer control (volunteer contraction), passing to quadruped position, obtaining stability in quadruped position, balance education in quadruped position, rising on the knees position, initializing the vertical position, obtaining orthostatic and respiratory education (2,3). The kinetic program followed the sequence of evolution of the neurological motor skill true: rolling, crawling, standing up, passing to quadruped position, movement in quadruped position, rising on the knees, orthostatic standing up, movement and breathing education (4,5). In every position, the facilities of the Margaret Rood and Vojta method (telescoping, brushing, stroking, stretching) played an essential role in the kinetic recovery program. In the spastic forms, pyramid shaped or mostly pyramid shaped, we used relaxation and mobility methods (6).

Results

Being aware of the specific modifications of secular infantile encephalitis we considered that using kinetic therapy, as correctly as possible, we will improve the functional capacity and self care of these patients. Further, after analyzing the results of our clinical trial I can affirm that we succeeded.

We used a series of evaluations, most of the time in the afternoon, the patients being extremely tired after the kinetic program applied in the morning (7:00 am) until lunch time (12:00 am). Then we compared the two lots: the experimental lot with which we actually worked with the reference lot made of subjects that didn't have constant activity.

The final conclusion is that after we applied the therapy procedures, the functional capacity and self care of persons with SIE was improved both in neurological motor skills and in respiratory function.

In table III and graph 1 we present a comparison between groups (the average of differences) referring to the evaluation of neurological motor skills – movement – rolling.

The experimental lot obtained at the initial testing, an average of 3.4 against 3.2 but at the end of the period the average obtained was equal in both groups 4.4. The difference between the averages of the two groups in the rolling evaluation is 0.2 for the experimental lot. During the intergroup comparison (table IV, graph 2) we can conclude that the exhaling capacity and the movable air volumes improved during the ping pong ball test (average of 0.2 cm). The difference between the averages of the lots is better for the experimental lot with 0.2.

During the intergroups comparison (table V, graph 3) we can conclude that the inhaling capacity and the movable air movement improved with an average of 0.8 cm (6.4 sec against 5.6 sec).

The difference between the averages of the lots was better for the experimental lot with 0.4.

Table III. Comparison reference lot/experimental – neurological motor skill evaluation – Movement – initial (I), final (F), difference (Dif)

	MOVEMENT														
	ROLLING			CRAWLING			QUADRUPED WALKING			KNEE WALKING			WALKING		
	I	F	Dif	I	F	Dif	I	F	Dif	I	F	Dif	I	F	Dif
Lot A	3.2	4.4	-1.2	2.4	3.6	-1.2	1.4	2.4	-1.2	1	2	-1	1	2.2	-1.2
Lot B	3.4	4.4	-1	2.4	3.6	-1.2	1.4	2.6	-1	1.2	2.6	-1.4	1	2.4	-1.4
Difference	-0.2	0	-0.2	0	0	0	0	-0.2	-0.2	-0.2	-0.6	-0.4	0.2	0.2	0

Graph 1. Comparison reference regarding neurological motor skill evaluation – movement – rolling -initial/final/difference

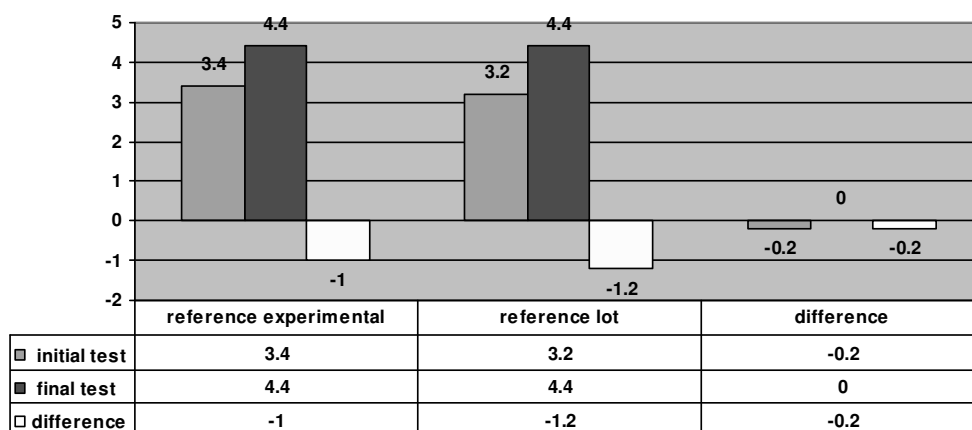


Table III. Evaluation of exhaling capacity – inter groups comparison (average of differences)

	Initial exhale	Final exhale	Difference
Experimental lot	8.2	12	3.8
Reference lot	8.2	11.8	3.6
Differences	0	0.2	0.2

Graph 2. Intergroup comparison regarding the evaluation of exhaling capacity (centimeters)

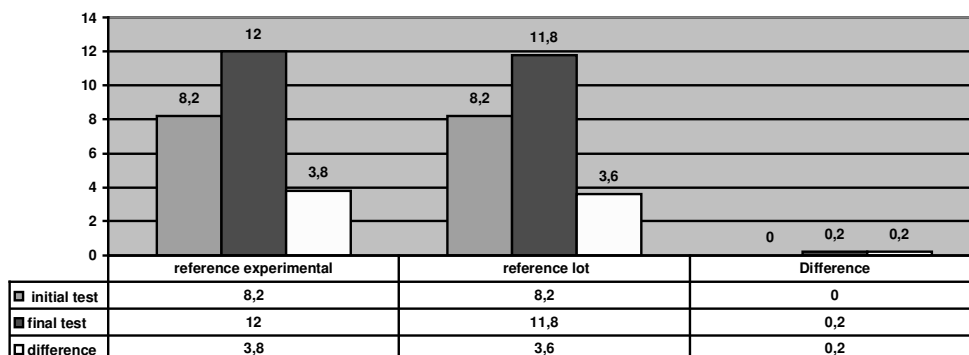
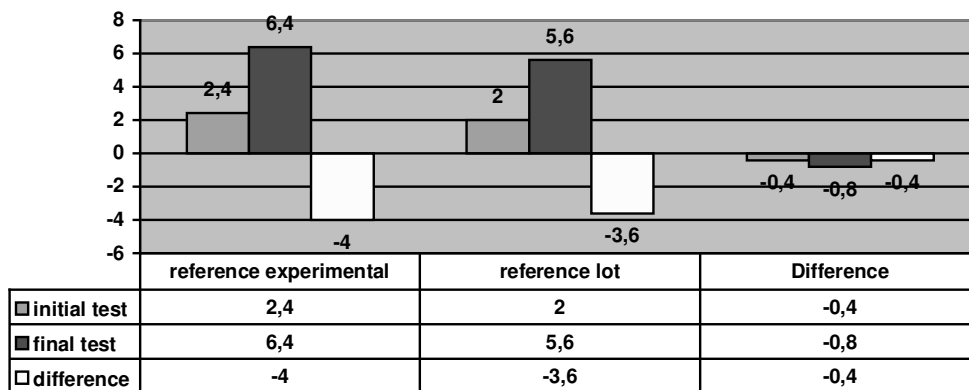


Table V. Evaluation of the inhaling capacity – inter group comparison (difference of averages)

	Initial inhaling (sec)	Final exhale (sec)	Difference
Exerimental lot	2.4	2	-0.4
Reference lot	6.4	5.6	-0.8
Difference	-4	-3.6	-0.4

Graph 3. Intergroup comparison regarding the evaluation of inhaling capacity (seconds)



Conclusions

Even if from quantity's point of view, the mathematical values we presented seem small, from qualities point of view we have to appreciate the huge performance obtained on the children taken in the study, on persons with SIE that present specific problems and in motor skills.

The rehabilitation treatment is a long run, a race against time, during many years, in which it must be worked on a daily basis with the child, according to the diagnosis, the objectives and the deficiencies found.

The basic idea is that, regarding the seriousness of the case and the diagnosis, there is no irrecoverable case, which should be abandoned.

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