HIPPOTHERAPY WITH CEREBRAL PALSY CHILDREN – OUR EXPERIENCE IN BULGARIA - A PILOT PROJECT

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/BULGARIA/

Cerebral Palsy /CP/ is a disease requiring management, including knowledge of different therapeutic methods, in compliance with the needs of the child at certain stage of his psycho-motor development. Hippotherapy offers to the children with Cerebral Palsy at the same time medicine, sport and pedagogy. For a first time in Bulgaria research was performed on the influence of hippotherapy on psycho-motor status in children with Cerebral Palsy.

The PURPOSE of this study was to measure range of the motor abilities, level of spasticity, body position in space and psychological functions after participation in a hippotherapy program.

M E T H O D

Participants

15 children with spastic /quadriparesis – 6; diparesis – 4; hamiparesis 5/Cerebral Palsy were involved in this study/. Children`s age varied between 2- 13 years, 8 of them boys and 7 girls.

Measures and assessments

We used the Holt test for child`s motor ability assessment, Development of the Gross Motor Function Classification System, Ashwohrt Scale for spasticity and the posture assessment scale allowed the rating therapist to visually assess and score alignment and symmetry of five body areas /Bertoti –1988/:1.Head and neck; 2.Shoulder and scapula; 3. Truck; 4. Spine; 5.Pelvis. We test also some psychological functions – emotional behavior activities include:

emotional stability, troublous level, motivation activity, and the components of attention.

Hippotherapy Programme

The child participated in a 10-12 week Hippotherapy included 12-14 procedures as total, once weekly, with duration 20-30 min. Hippotherapy programme Each child rode twice weekly. The horses were led only at a walking pace. The exercises on the horseback were in a prone, side –lying or siting position. In the seat position the child, stretched to touch his own toes, or rotated to reach for the horse tail, tried to raise his own arms into different positions to increased trunk extension, rotation, stretched to reach for the horse`s ears. The balance activity of the child was trained with the child sitting facing, either the front or the back of the horse. During the first sessions the horse was led in a straight forward direction, later the horse was led in circles or in a serpentine.

DATA ANALISIS

Results and discussion

The results are demonstrated in tables and graphics.
The number of children for each GMFCS level was – Level I /n=7/; Level II/n=5/; Level III/n=2/; Level IV/n=1/.Mean GMFCS score for I gr. –1,55;for II gr.- 1,66 ./tabl. 3/ At the end of the survey there is no change and transfer to an upper level. The said applies for the surveying of the degree of spasticity according to **Ashuart** - 4 of the children achieved a score of 3; 5 achieved a score of 2; 2 achieved a score of 1+ and 4 achieved a score of 1. ./tabl. 3/ The **IQ** showed no changes either. We consider that due to the lower dynamics of these indexes it is necessary to ensure a longer period of surveillance.
The **Holt test** demonstrated increased score in both age groups, more manifested in the group encompassing children from 2 to 7 years of age. The average score change according to Holt in the smaller age group /from 2 to 6 years of age/ increased from 109 in the beginning to 116,6 at the end of the test, and in the upper age group/from7to 13 years / from 137,5 to 139,6. The score increase on the Holt test is due

to the stabilization of gate, assuming standing position with other's assistance and climbing up and down stairs, which is done with support and stabilizing pace in children able to walk and improvement of the head control, erection of the torso and stable support at four points in children unable to walk. One may note that in small children the improvement is much more marked. The greater improvement in small children may be explained by the insufficient time to fix the pathological motor stereotypes and lack of secondary complications. In bigger children the deterioration in motor functions is linked to a great extent to the fixed motor contractures, strong spasm of a number of muscle groups, deformities being formed, as well as to the constant pathological regulation by the Central Nervous System./tabl. 1,fig.1/ We obtained a similar change in **Bertotti test**. The score increase in both age groups is due to the improved position of the head, the posture and erection of the torso during horseback riding and smaller improvement upon stabilization of the pelvis. The most considerable improvement was observed in children suffering from hemiparesis, followed by the ones with diparesis and most insignificant in children with quadriparesis. /tabl. 2,fig.2/

The analysis of attention span components in both age groups showed the following changes /Table 7, fig. 6 a,b/ - 20% of children distributed initially in the groups with considerable and moderate attention disturbance have been transferred to the groups of slight attention disturbance and normal as only one child remained unchanged, and the percentage of children having achieved normal parameters of attention at the end of the study reached 46,66%. It is important to mention that all components of attention have improved in both age groups.

The emotional and behavioral sphere is characterized by rather dynamic processes, since it is influenced by various factors. Thus making its assessment difficult. The inclusion of hyppotherapy in the complex rehabilitation of children suffering from Cerebral palsy showed the following changes at the end of the therapeutic course:

a/ the greatest improvement is noted for the emotional stability index - 40% of the children after the therapeutic course have been transferred to a borderline and stable state, and only 20% remain unstable (Table 4, fig. 3 a,b);

b/ the anxiety index showed a trend towards decrease from high to moderate and low, as 33,33% of children remained with high anxiety (Table 5, fig.4 a,b);

c/ behavioral motivation showed the same results as anxiety. The relation with the horse as a friend proved to be a real stimulus for the active involvement in the therapeutic program (Table 6, fig. 5 a,b);
Due to the small difference in the attention and the emotional and behavioral sphere indexes in smaller and bigger children we do not separate them by age.

CONCLUSION

The results of this study constituite the first objective analisis of the hippotherapy effects for the children with CP in Bulgaria.
The results show that:
1.Children with spastic CP demonstrated significant inprovement in posture control and motor abilityes after Hippotherapy programme;
2.More inprovement in the posture and motor abilityes are observed in the younger children, because they still don't have fixed constant pathological motional stereotypes.
3.There were not changes in **GMFCS** and Ashworth Scale after Hippotherapy programme in the two groupes.
4.There were positive effect on some emotional behaiviour activities - emotional stability, anxiety, behavioral motivation, and the componens of attention.

References:
1.Bertotti D.B. Effect of therapeutic horseback riding on posture in children with cerebral palsy. *Physical Therapy*1988 10;1505-12 ,
2.Holt KS. Child development: Diagnosis and Assessment. London: *Butterworth-Heinemann, 1991.*
3.Sterba J A, at all. Horseback riding in children with cerebral palsy: effect on gross motor function – *Development Medicine & Child Neurology* 2002, 44: 301-308

Motor tests

Tabl. 1 **Holt test/points**/

Age/years/	Beginning of the study		End of the study		d	t	p
	$\overline{x}$	s	$\overline{x}$	s			
2-6	108,67	45,67	115,89	44,50	7,22	2,95	<0,01
7-13	138,5	37,03	140,67	37,09	2,17	2,23	<0,05

Tabl. 2 **Bertotti test /points**/

Age/years/	Beginning of the study		End of the study		d	t	p
	$\overline{x}$	s	$\overline{x}$	s			
2-6	7,22	2,54	9,66	2,83	2,44	5,5	<0,001
7-13	7,83	1,94	9,50	2,09	21,67	3,59	<0,001

Tabl .3 **GMFCS and Ashworth Scale**

Age/years/	GMFCS					Ashworth Scale				
	Level I	Level II	Level III	Level IV	Level V	Grate1	Grate 1+	Grate 2	Grate 3	Grate 4
2-6	4	2	0	1	0	2	1	2	2	0
7-13	3	3	2	0	0	2	0	3	2	0

Emotional and behavioral scales

Table 4.

I. Emotional stability

Unstable			Borderline state			Stable		
in the beginning	in the end	difference	in the beginning	in the end	difference	in the beginning	in the end	difference
9	3	- 6	3	6	+ 3	3	6	+ 3
60,0 %	20,0%	40,0%	20,0%	40,0%	20,0%	20,0%	40,0%	20,0%

Table 5

II. Anxiety

High			Average			Low		
in the beginning	in the end	difference	in the beginning	in the end	difference	in the beginning	in the end	difference
7	5	- 2	3	3	0	5	7	+2
46,7%	33,3%	13,3%	20,0%	20,0%	0	33,3%	46,7%	13,3%

Table 6.

III. Behavioral motivation

Low			Average			High		
in the beginning	in the end	difference	in the beginning	in the end	difference	in the beginning	in the end	difference
7	5	- 2	3	5	+ 2	5	5	0
46,7%	33,3%	13,3%	20,0%	33,3%	13,3%	33,3%	33,3%	0

Table 7.

Attention surveillance

Considerably impaired			Moderately impaired			Slightly impaired			Normal		
in the beginning	in the end	difference	in the beginning	in the end	difference	in the beginning	in the end	difference	in the beginning	in the end	difference
5	1	+ 4	3	4	+ 1	3	3	0	4	7	+ 3
33,3%	6,6%	26,7%	20,0%	26,7%	6,6%	20,0%	20,0%	0	26,7%	46,7%	20,0%