OPTIMIZATION OF THE KINESITHERAPEUTIC PROGRAM BY THE USE OF HIPPOTHERAPY WITH CHILDREN WITH GENETIC SYNDROMES (PILOT STUDY)

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Abstract. The purpose of the current study was to optimize the kinesitherapeutic program with children having the syndromes of Dawn and Prader-Willi by the use of hippotherapy course.
There were 24 sessions of hippotherapy with 4 children children having syndromes of Dawn and Prader-Willi. We performed the following tests: Bertoti test, Holt test, Danzinger test.
The introduction of hippotherapy in rehabilitation of young patients having Dawn and Prader-Willi syndromes could to a great extent assist their psycho-physical development.
Key words: Dawn syndrome, Prader-Willi syndrome, kinesitherapy, horse riding, exercises

INTRODUCTION

The chromosome disease is spreading up as a result of chromosome mutations which change the normal number, or the structure of the chromosomes. The chromosome diseases develop whenever there is a quantity change in the heredity material. In our country there are about 420 children, born with chromosome diseases annually [2].The early diagnostics of chromosome anomalies and the prophylactics of children bom with genetic diseases has always been and still is an actual problem for the society and modern medicine [2, 10]. If born with such diseases the children are in need of constant cares throughout their whole lives.

The Down syndrome is the most common autozome anomaly. It occurs in 1, 5 of 1000 newborns. The Down syndrome is a chromosome anomaly which is characterized by the existence of 47 chromosomes, instead of the usual 46. It is characterized by heavy mental derangement IQ - 50 %. and acute hypotony. In 50% of the cases there is an inborn heart defect [9].

The Prader-Willi syndrome, caused by a genetic anomaly in 15 chromosomes has a frequency of occurrence 1:15000. It is characterized by apathy, slackness, muscle hypotony, hyperphagia, and the connected to it obesity, decreased motion activity and mental derangement [3,6,11J.

The application of kinesitherapy, in combination with medical therapy and skillful control of the diet could to a great extent help the improvement all of the psycho-physical condition of the patients. The assignment of the proper kinesitherapy is important not only for the parents but also provides a better and more complete information to teachers in connection to the teaching of such children. The children having genetic syndromes should perform at home and at school not only activities connected to the fine movements, for example drawing, reading and writing, filling out puzzles, which do not require special movement activity and a waste of energy. They should participate in various sport-disciplines for improvement of their common abilities to moveq and control over their body weight, especially with children having Prader-Willi[3,6,l 1].It is recommended to do some velo-training, swimming and sports elements, but they should avoid any exercises connected to prolonged jumping, jogging, etc.which strongly overtax the knee joints. In the literature available we have found some data for KT in the Down's syndrome and very scarce information for the application of kinesitherapy in PWS and hyppotherapy for the mentioned above diseases. We believe that the application of hippotherapy in combination with therapy programs could enrich the rehabilitation program of those types of impairments.

THE PURPOSE of the current study was to optimize the kinesitherapeutic program with children having the syndromes of Dawn and Prader-Willi by the use of hippotherapy course.

MATERIAL AND METHODS

During a period of two months we have performed 24 sessions of hypo therapy with children having the syndromes of Dawn and Prader-Willi. During that period the kids did not have any kinesitherapy.

The study was performed with 4 children - 3 with the syndrome of Dawn and 1 having the syndromes of Prader-Willi (Table. 1).

Tabled Distribution of children according to sex, age and syndrome

Indicators	Dawn syndrome	Prader-Willy syndrome.
Number of children	3	1
Sex	2 girls, 1 boy	1 girl
Age	From 2 to 5 years old (x = 4,5)	4 years

At the beginning and by the end of the treatment we performed the following tests:

- Specialized Bertoti test [l]for studying the position of the head, shoulders, shoulder-blades, body, spinal cord, and hips during horse-riding.

- Holt test [7] - is an valuation of the movement capabilities from various starting positions with kids having Cerebral Palsy, where the way of performance gives a specific number of points. We decided that the test could be applied to children with genetic syndromes. The test provides the opportunity for quantity evaluation of the movement capabilities of the child. The score of all points collected during the tests is taken into account.

- Test of Danzinger [4] for evaluation of the degree of dependence of people with impairments during horse riding - from 0 (full dependence from the assistants) to 8 (full independence).

The purpose of the hippotherapy was maximal stimulation of the psycho-physical development of the children and prevention of complications like obesity, diabetes, spinal deformations and deformations resulting from muscle hypotony, as well as development of psycho-depressive conditions, etc.

Our targets were as follows:

1. Assistance in the development of the components of the rough movements:
- Feeling for a better posture;
- Balance and coordination,
- Proprioreception,
- Stimulation of the hypotonic muscles and their strengthening - abdominal, back and limb-muscles;
2. Assistance for the development of the fine movements;
3. Creation and reassertion of continuity off the movement habits;
4. Avoiding of development of wrong movement habits and stereotypes;
5. The improvement of the psycho-emotional tonus of the child by balancing the processes of excitement and suppression;
6. Development of useful communication capabilities - therapists, course, parents, the other children, etc.

Usually the hippotherapy is performed twice weekly. Even though, in that case we decided to have them three times during the first week and every day during the following weeks, because of lack of other kinesitherapy procedures. The length of each separate session was from 20 to 30 minutes.

The hippotherapy program was directed towards: acquaintance to the new environment, creation of specific contact between child and horse, correction of incorrect posture and training of correct riding posture, horse riding in straight direction, in a curve, serpentines, stationary exercises with and without sports equipment, including of the abdominal, spinal, and buttocks muscles for coordination and balance; exercises against manual resistance for strengthening of the muscles of the lower and upper limbs. Having in mind the specifics of the diseases in the beginning the exercises were performed in an easy mode. The children were not allowed to be fatigued.

RESULTS AND DISCUSSIONS

As a result of the hippotherapy course we have observed the following changes in the indicators under observation by the end of the study, compared to the initial indicators (Table.2).

The Holt test showed an increase of 10 points for the short duration of the study which is very indicative for the positive effect of hippotherapy over the global movement functions of children having the Dawn syndrome. The increase of the points in the tests are exclusively resulting from the improvement

in the tests for strength of the lower limbs, walking, jumping, and going to up-and-down the stairs. The balance has been improved in all starting positions (sitting, knee support, straight stand). In regards to the coordination, the children performed the test movements much easier.

With the child having the syndrome of Prader-Willi there was a strengthening of the abdominal and spinal muscles, an improvement of the balance and improved stability during walking.

As it was evident in the table of the test of Bertoti there was a difference of 4,25 points, and towards the end of the course, and we had 12,5 points from 15 possible. The positive change in all children was resulting in a much improved straightening of the body, which we connect to the strengthening of the spinal and abdominal muscles, stabilization of the hips and creation of correct movement habits for correction of posture during horse riding.

Table.2 Changes in the indicators from the tests of Bertoti and Holt

Name	Test of Holt (points)			Test of Bertoti (points)		
	Beginning	End	Difference	Beginning	End	Difference
M.N	141	163	22	9	14	5
A.G	136	144	8	10	14	4
K.V.	110	129	19	8	10	2
V.P.	117	126	9	6	12	6
Average	126	140,5	14,5	8,25	12,5	4,25

The dependence and support during horse riding are in indirect connection to the movement and psychological condition of the children. When they improve their posture, they decrease the lateral deformation in forward-backward direction and get used to not being held constantly, because they have improved their balance capabilities and have increased the feeling for stability and security, and thus feeling unaided and independent. In the beginning of the course of treatment the children were leaning over the horse and could not straighten their bodies. As a result of stimulation and constant correction of the incorrect movement schemes by the kinesitherapists and the movement of the horseback, all children, as shown in the test of Bertoti have improved their postures on the horseback, and could longer keep their heads alongside and their bodies straight, had a better stand over the handles of the supplementary belt. The Danzinger test showed a decrease of the dependence from the assistants during horse riding, which is shown in table 3. It is evident that the child with PWC of 5 th degree, with two assistants have passed to the 7 th degree.(Table 3)

Table3. Distribution of the number of children according to the various degrees of Danzinger

Syndrome pop-up	n	Degrees of dependence in the beginning of the study								Degrees of dependence in the final of the study							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Dawn	3			1		2								1	1	2	
PWS	1					1										1	

CONCLUSION

The rare distribution of the PWS syndrome and the difficulties connected to the participation of children with Dawn syndrome in activities different from the ones offered in the institutions for medical and social care and other specialized institutions for children did not provide an opportunity for the application of the program of hippotherapy with greater number of patients, which could have led to trustworthiness of the results provided. We believe that the introduction of hippotherapy and rehabilitation of young patients having Dawn and PWS syndromes, in combination with diets, medicine therapy and the rest of the means of the kinesitherapy, could to a great extent assist not only their psycho-physical development and prophylactics, but also their social integration. The performed pilot experiment with such patient contingent could be enriched by any some over the psycho-emotional condition of the children which will be an object for our further studies.

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