

The Influence of Physical Rehabilitation Program on the Body Spatial Organization of the 8 Years Old Children with Posture Violation in the Frontal Plane and 1st and 2nd Degree Scoliosis

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Abstract: Research was devoted for an actual problem of correction scoliosis to deformation and infringements of a bearing in a frontal plane in conditions. General educational establishment at 8 years Iran children was performed. The author offered the original program physical rehabilitations with application of exercises on restoration of vestibular function in conditions of general educational establishment.

Key words: Scoliosis • Physical rehabilitation • Children

INTRODUCTION

Creation, preservation and strengthening of school health, healthy lifestyle, creating adequate conditions for their physical, intellectual and moral development, rehabilitation of existing variations in health status has always been and remained a priority problem of any society [1, 2].

In the researches of the lot of authors, the number of school-age children with different disabilities in the physical health is constantly increased [3-5]. This trend has been featured in many countries, including Ukraine, Russia, Iran, Palestine and Jordan. A material adverse effect on the child's body has a lot of school risk factors that contribute to the further health decreasing in the children and adolescents [2].

In school-age children, the most significant increase in the frequency of deviations in the motor system was four times more: as an incorrect posture, scoliosis, flat feet etc. Already, in the early stages of such deviations, in the students were observed delay and disturbance of bone formation, weakness ligamentous and motor system and it has a correlation with lack of muscles development, exacerbation of concomitant diseases, which can reduce the level of physical development and physical health of the child [2].

In many children with similar condition of weakened nervous system, slowed down the speed of thought

processes, decreased performance and increased fatigue and there was a delay in the motor skills development [3, 5].

The modern of physical education program problem in secondary school does not allow a child with disabilities in motor system fully maintain and restore their health [3, 5]. The mandatory measures are generally recognized: as the prevention of the motor system deformations, timely detection and elimination of the causes of incorrect posture and scoliosis, through the using of various tools and techniques. Here is one of the leading places would take a physical education and in particular, corrective exercises aimed at correcting spinal deformities [2, 6].

In Ukraine, children with a spinal diseases are educated in special boarding schools for children with motor or correctional schools, the learning mode right there are specially designed for this group of students. In Iran, there is no such institutions. The system of improvement measures and treatment of children with flat feet, impaired posture and scoliosis involves herself with medical procedures and individual lessons. There can be applied the methods of conservative treatment for scoliosis 1st and 2nd degree in 2-18% of cases, it does not provide a favorable outcome of the disease [7]. Mohammad Akbari [8] gave several different data that despite conducted conservative treatment in 16-22% of patients with scoliosis deformity continues to progress.

The objective of the present study lies on the need for the rational organization of diagnostic, remedial and recreational and therapeutic and preventive work with children in educational institution in order to achieve a maximum effectiveness of the rehabilitation, especially in the early stages of adverse deviations in the motor system.

MATERIALS AND METHODS

The present thesis work was done according to the plan of scientific research of the Physical Rehabilitation Department in NUPESU, consolidated plan of research in the field of physical culture and sports in 2006-2010 years. Tags: 4.1.5. "Modern principles of prevention and rehabilitation of disorders in the motor system", No 0106U010793 and on topic: 4.3.1. "Improvement of recreation and rehabilitation programs for the prevention and correction of dysfunctions caused by disturbances in the different body systems", No 0106U010794. The author carried out the section, devoted to the physical rehabilitation of school children 6-8 years old with impaired posture and scoliosis.

The aim of our research was to study the effect of physical rehabilitation programs for the primary school age children with incorrect posture in the frontal plane and scoliosis 1st and 2nd degree in educational institution of Iran, on the spatial organization of the 8 years old children bodies.

The Objectives:

- To develop and validate a physical rehabilitation program in a comprehensive school for primary school age children with scoliosis, living in Iran.
- To determine the effectiveness and the influence of the proposed physical rehabilitation tools and methods on the functional condition of the younger students' spine and the body, residing in the territory of Iran.

The methods used in our research are there follows: analysis of special scientific and methodical literature, educational experiment, photometry using the program «Ergo therapy», methods of mathematical statistics;

RESULTS

In this study, were used the familiar technique of the general developmental exercises for all muscle groups. Children were taught the performing technique of of

specific exercises, there was founded the basis for the formation of correct posture (the using of "aggressive" posture correction of existing defect in a standing position with the support of the wall, followed by unsupported position), was performed the increasing of the spinal mobility.

Each special exercise was repeated 4 or 6 times at a slow and medium pace. The total amount of exercise in the complex was 20-23 exercises, the number of which amounted to six sessions from 33 to 40 exercises. From the third class, there was used the method of repeated loads. Rest between sets was from 15 to 20 sec. At this time the child relaxes of the working muscles. Motor density classes do not exceed than 70%. Most of the studies carried out in the handling of an initial positions as a supine, prone, standing on all fours (with care), on their knees. Therapeutic exercises included the implementation of dynamic, static and dynamic exercises, relaxation exercises, breathing exercises, exercises in self - traction, gaming exercises. The studies duration at this stage was gradually increased from 20 to 45 minutes.

Corrective training period consisted from the 40 lessons of physical training and physical therapy for 40 sessions, which were held twice a week by the few-group (from 4 to 6 children per group).

The Tasks of the Period Were Follows:

- The muscular training;
- The correction of existing posture defect,
- The correction of a scoliosis,
- The cardiovascular system training to successively increasing physical exercise;
- The improving of the school children physical development.

In this period increase the part of special exercises, designed for training the muscular system, combined with corrective exercises and positions, skill training was carried out for proper posture in different positions. Each special exercise was repeated 12-20 times and more preferably in the middle and a slow pace by repeated or re-interval exercise.

There was an applied general developmental exercise in a standing position, breathing exercises and relaxation exercises in the supine position.

The main part of the session included an exercises with control of muscle-joint sense on the balancing platforms, pillows and paths for active proprioception for scoliosis correction.

Table 1: Dynamics of the spinal angular characteristics in the primary school age children with incorrect posture in the frontal plane and scoliosis 1st and 2nd degree

Groups		Head incline angle, °		Shoulder incline angle, °	
		Before	After	Before	After
Main group (n=29)	∞	3,27	1,12	7,75	4,66
	S	1,24	0,58	2,62	1,88
	m	0,23	0,11	0,50	0,36
Control (n=23)	∞	3,10	2,39	7,57	7,10
	S	1,62	0,92	2,29	2,35
	m	0,37	0,21	0,53	0,54
Student's t test	t	0,39	5,33	0,24	3,78
Groups		Scapulas incline angle, °		Pelvis incline angle, °	
		Before	After	Before	After
Main group No 3 (n=29)	∞	7,33	4,76	2,69	1,51
	S	1,03	1,27	0,89	0,92
	m	0,20	0,24	0,17	0,17
Control group No 3 (n=23)	∞	7,00	6,33	2,50	2,30
	S	1,75	1,15	0,79	0,55
	m	0,40	0,26	0,18	0,13
Крит. Стьюдента	t	0,73	4,40	0,78	3,66

The results are significant at $t > 2.00$ ($p < 0.05$)

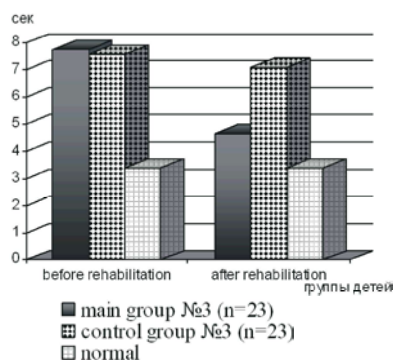


Fig. 1: Dynamics Of The Shoulder Incline Angle In 8 Years Old Children

Outdoor games, completing a major part, were consolidating for the progressing in class skills maintain, for the correct posture and maintain mental and emotional attitude of the children. The games were held mostly at a fast pace, as competitive games, relay races and cooperative games. The total number of exercises for the tenth lesson is between 40 and 45 exercises and it was maintained throughout the corrective training period.

The stabilization period consisted from the 20 sessions of a PE and 20 TE sessions, which were held three times a week, by the group method (from 8 to 12 children per group).

The total number of exercises in one session of the stabilization period was gradually reduced from 40-45 to 33-35 exercises.

The evaluation of the effectiveness the developed physical rehabilitation program aimed at correcting scoliosis and posture disorders in the primary school age children was conducted, compared changes in mean values of physiological curves of the spine of control group children after the pedagogical experiment (Table 1).

The analysis of the data leads to the conclusion that the majority of the studied parameters in the control group children and major group to carry out the basic pedagogic experiment, there wasn't statistically significant differences ($p > 0.05$). As a result of the work done for the correction of scoliosis and posture disorders in primary school age children were identified as follows: the main group of children 8 years old angle of the head was down on a 65.7% and it were close to normal changes, in the control group this significance were 22.9% ($p < 0.05$).

The angle of the shoulder has changed in the basic group number 3 by 39.9% and in the control group by 6%. The identified changes we can make a conclusion about the benefits of our proposed program in relation to the basic guidelines of the program «Ergo Therapy».

A physical rehabilitation program in the frames of a general educational institutions for primary school age children with scoliosis, live in Iran were included: theoretical classes, morning hygienic gymnastics, corrective exercises as part of physical education lessons, sport-pauses and physiotherapy sessions;

The physical rehabilitation course was divided into the three periods.

Adaptation period consisted of 10 physical training and 10 sessions of TE, which were carried out 2 times a week, few-group method (from 4 to 6 children per group). Start dates corresponded to the beginning of the 1st semester of the school, which started on September, 22nd. In the early period were performed various tests conducted by the medical commission of the school children, the pathologies identification, the groups formation.

General developmental and breathing exercises, self – traction performed in the originally standing position. Exercises have been used by the wall, the mirror in balancing (with the subject on the head on the pillows for proprioception with a reduced support area), in the equilibrium. We used in balance exercises the principle that the more changes the center of gravity, the more demands are placed on differentiating the muscles involved in balancing the body.

Exercises with muscle-joint sense control in the balancing platforms, pillows and tracks for proprioception are directed to perform an exercises with a different coordination, which combined the movement in th arms and legs, trunk, change the basic assumptions of one exercise (sitting, lying down, sitting, lying down focus-grouping - grouping).

If the dynamics of the angle of inclination of the head may experience some errors due to improper position of the body in photometry, the angle of the shoulder, blade and pelvis is a good indicator of the child vertical posture correction. As the analysis of experimental data, there is to decline in the angle of the blades was noted in the study and control groups with a significant ($p < 0.05$). At the same time, according to information received there was a significant difference when comparing the main and control groups.

During the comparing of the changes in the spinal position in the frontal plane, the main group compared with the control, it can be stated that the angle of the blades to change significantly ($p < 0.05$) 35.0%. Changes in the control group were not so great and made up 9.5%. Indicators angle pelvis during pedagogical experiment with changed significantly ($p < 0.05$) in the third main group, 43.8% in the control group by 8%.

DISCUSSION

The main and most difficult task that determines the success of rehabilitation, generally, is not mobilized and distortion correction and stabilization of the spine, for correcting the situation [3, 9]. The deformity correction is

not backed up by actions that ensure the spinal stabilization, it's not effective. Maintaining the correction by means of physical rehabilitation can be enhanced by the formation of a new static and dynamic stereotype, it adapted to the introduced changes in the levels of the spine. Changes in the static and dynamic stereotype is performed by the deliberating action on the upstream and downstream with respect to the curvature of the main links if the motor system and the regulation of the relations with tone paired in muscle groups involved in the posture formation [3].

The using of the therapeutic effect of physical exercises in scoliosis should be aimed primarily at preventing its progression and, if not contraindicated deformity correction, the curvature correction and rotation of the vertebral bodies [3, 6, 9].

The program evolved with a suit the individual characteristics of the child: as a severity of incorrect posture and scoliosis, sided flattening, results of tests, comorbidities, learning new exercises, psychological disposition for performing the special exercises and the whole complex, requiring considerable physical and willpower [4].

The Tasks of the Period Were Follows [5]:

- The adaptation to a gradually increasing physical activity;
- The adaptation to the possibility of correct posture maintaining;
- The increasing of the psycho-emotional tone;
- The improving of a blood and lymph circulation;
- The training of rational technique during special exercises.

The Tasks of the Period Were Follows:

- The strengthening of the correct posture and spinal stabilization in a familiar position, in different kinds of exercises and in the complicated conditions of their implementation;
- The gradual decreasing in overall physical activity;
- The formation of the independent exercise of special skill exercises.

During this period, had been perfected of specific exercises performing with a changing environment (outdoor games), whose share in employment is gradually reduced. Each special exercise was repeated from 8 to 10 times, at the average rate [2].

CONCLUSIONS

The performing studies have shown that the original physical rehabilitation program used for primary school age children with impaired posture in the frontal plane and scoliosis 1st and 2nd degree in educational institution containing the methodological and organizational approaches to the scoliosis correction, which takes into account quantitative traits of a posture disorders, contributes to a more effective correction of the body spatial organization and to neutralize the negative impact of school risk factors.

Prospects for further research. In further work we are planning for the development of physical rehabilitation programs for children with combined disabilities in the motor system.

REFERENCES

1. Balsevich, V.K., V.G. Bolshenkov and F.P. Rjabintsev, 1996. The concept of physical education in the improving orientation of primary school pupils in the secondary schools // *Physical Culture. Scientific and Methodic Journal*, 2: 13-18.
2. Uzdinova, O.I., L.A. Balabukha and A.A. Samkov, 2007. On the problem of differentiated physical education students in special medical group // *Bulletin of Adyghe State University*, 11: 3-14.
3. Autukhova, R.A., 2005. Learning lying. Training and education of primary school children with motor system disabilities in regular school // *Children's Health #20 (295)*, October, 16-31.
4. Bazarnyi, V.F., 2004. School stress and demographic catastrophe Russia. The collection of materials. The Academy of Medical Sciences, Siberian Branch of the Institute of Medical Problems of the North. Research and Innovation Laboratory physiological and health problems of education of the Administration of the Moscow region. Sergiev Posad.
5. Bezrukii, M.M., 2004. Difficulty during the learning in elementary school. Causes, diagnosis, treatment complex. AM AST, pp: 167.
6. Uncommitted Changes and Static Deformation of the Motor System: handbook / Ed. by G.E. Verich, R.A. Bannikova. Kiev Olympic Literature, 1998, pp: 30.
7. Sobhal Hasan, 2001. The studying of the anatomical abnormalities among school children (boys) in Yazd region. Tehran Pedagogical Institute, pp: 225.
8. Akbari and Mohammad, 1994. The identifying of the spine pathology level among pupils (11-15 years boys) in the city of Isfahan and recommendations for correction. University of Tehran, pp: 150.
9. Sohangui Yahiya Corrective Exercises. Tehran, 2003, pp: 498.