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Effectiveness of physical education for students of special medical groups withosteochondrosisof thecervical spine

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Abstract:

The *relevance of the study* is that the number of patients with osteochondrosis increases every year. The disease causes severe neurological and orthopedic disorders that lead to losing workability and disability. *Objective of the work:* to study the effectiveness of physical exercises applying due to the results of orthopedic research methods and talks with students of special medical groups who suffer from cervical spinal osteochondrosis. While organizing medical gymnastics trainings we should take into account etiopathogenetical processes of course of the disease and practice exercises aimed at muscles relaxation, increasing of stability of vestibular system, coordination, dynamic exercises for all muscle groups, special respiratory exercises, exercises on strengthening of muscles of neck and trunk. After the experiment students noticed that pain in neck disappeared, general state has improved; indices of movements in cervical spine have increased. All these facts prove the positive influence of medical gymnastics on organism and its functional abilities.

Key words:

medical gymnastics, range ofmotion, osteochondrosis of spine, general state, students, physical exercises, cervical spine.

Problem formation. In the structure of the spine diseases osteochondrosis has a special place. Multiple data from both domestic and foreign authors indicate that the number of patients with osteochondrosis increases every year. Osteochondrosis often causes severe neurological and orthopedic disorders that lead to losing efficiency and sometimes disabling, that is why the problem of its adequate treatment and prevention is of great medical and social importance. According to R. Gatchel more than 80% of the world's adult population is experiencing back pain. He has personal experience of treatment of neurological symptoms[6].

In most cases spine osteochondrosis is the result of muscle overstrains that occur while making similar type of physical movement. It mainly develops among individuals with weakened muscular system. Restoring of elastic properties of cartilaginous tissue promotes the use of special physical exercises that stretch intervertebral cartilages that improves their nutrition and oxygen supply.

Analysis of the recent research and publications. According to A. Knapic, E. Saulicz, M. Kuszewski, R. Plinta [7], various moderate physical activities favorably affect the spine and joints. Special exercises not only help to strengthen muscles, but also develop compensatory mechanisms aimed at restoring the broken condition of physiological balance of vertebral motor segments. Physical exercises are the primary means of healthful gymnastics.

Muscle relaxation exercises are important for treatment of patients with spinal osteochondrosis. They help to reduce compression of spinal cord roots, relieve fatigue, and improve blood and lymph circulation in overstrained muscles. Muscle relaxation in spinal osteochondrosis is being carried by reducing tension of the muscles that keep the head and torso upright; easy shaking of the relaxed part of the body; free wing movements of the upper limbs. Relaxing muscles of the shoulder girdle promote: starting position is lying down or sitting with support for the head, back and arms; static breathing exercises provided with no hands weight (put them on resistance); slight shake of the shoulder girdle area on the upper third of the shoulder; slight shaking hands in the slope; free lowering raised shoulder girdle fixation with hands on resistance. Free upper limb muscle relaxation can be achieved by slight shaking of hands; lowering the designated free hand; free fly motion with hands. According to R. Carney, K. Freedland, one of the key aspects of rehabilitation is dosed vertebrogenickinesitherapy [5].

Special coordination-based exercises help to improve blood supply to the roots throughout their length. Thus, simultaneous movements of joints of the limbs, and the movements can be performed either in one direction or in different directions both same and oppositely limbs.

Special breathing exercises play an important role in treatment of patients with spinal osteochondrosis as significant part of the respiratory muscles are in a state of fatigue, because of their prolonged overstrain. As the pain fades away diaphragmatic breathing should be included. Thus, the use of special breathing exercises in spinal osteochondrosis helps to reduce strain and improves blood circulation conditions to muscles of the neck, shoulder girdle and lower back. They are usually involved in the pathological process.

Exercises aimed to strengthen muscles of the neck and torso help to restore functioning of the spine, rehabilitation and prevent relapses. As for controlling muscle groups there are used mostly static exercises, their use is appropriate only after elimination of clinical case of the disease. Earlier application of the exercises in static muscle tension can cause exacerbation of the disease [1]. Strengthening muscles of the neck and torso should be performed in a standing position. Prolonged tension in the muscles lead to deteriorating terms of circulation and metabolism and that is why desired effect could not be achieved.

The work had the following **objective**: studying effectiveness of the developed techniques of normalization of motion in the cervical spine region is based on the results of orthopedic research methods for students with cervical spinal osteochondrosis enrolled in a special medical group.

To achieve the objectives it was applied the following **research methods**: analysis of scientific and technical literature; pedagogical supervision; orthopedic methods (determination of motion in the cervical spine, determine range of motion of the head and neck).

Presentation of the main material of the research. Experimental work was carried out during 2014–2015 at LesyaUkrainka Eastern European National University. In the experiment took part students aged 19–20 (16 boys and 20 girls), who for health reasons were attributed to a special medical group with the diagnosis — first degree of cervical osteochondrosis, characterized the beginning of destruction of the intervertebral discs, appearance of aching pain. There were no pain in some of the investigated, but the disease proceeded with noticeable discomfort in the neck.

Investigated were divided into two groups: control (8 boys and 10 girls) and experimental (8 boys and 10 girls). The control group was engaged in the studying according to traditional methods. Young boys and girls performed same exercises that were focused on strengthening the muscle corset, correcting posture, increasing flexibility copula-muscular system, increasing the stereotype of correct movements. Massage and self–massage were recommended to strengthen the muscles and to relieve tension in the neck area.

The methodology of the studies in the experimental group was based on the development of I. Kosheteva, M. Repnevska, D. Yakovenko. The feature of the developed technique was that a set of exercises for boys and girls was different. Exercises to strengthen side and front neck muscles, massage exercises that improve blood flow to the brain and exercises for formation of the correct posture while lying, standing, walking and sitting at a desk were to be carried out for students of both sexes. Exercises to stretch the spine, such as hang on the crossbar and exercises from the yoga arsenal did only the girls. Guys did exercises that develop muscles and support the spine, pull-ups, push-ups, and training on simulators. Along with traditional massage and self-massage was proposed to do an anesthetic honey massage-compress: put a little bit of honey on the heated neck and shoulder area, squeeze a hand to the sore spot, and then pick up sharply, wrap the sore spot and leave for an hour.

During the experimental work it was aimed to determine the efficacy of traditional and proposed methods, students were evaluated in the control and experimental groups: range of motion in the cervical spine (during the inspection was indicated the direction with a limited range of motion of head and neck).

The soil survey of students with spinal osteochondrosis requires thorough study methods of treatment based on the results of research of other experts. I. Kosheteva [2] gives conclusion on health and functional status of the organism of those under investigation and determines tolerance to physical activity according to evaluation of physical condition and physical performance. Her recommendations include adequate to health status types of physical activity and individual exercises. To reduce pain and improve overall health she recommends simple in performance exercises, therapeutic posture and massage techniques.

M. Repnevska et al [3] show that in cervical osteochondrosis spine extension is effective as well as compliance of general methodological principles. Working with students with spinal osteochondrosis in the initial and main periods of treatment active movement in the cervical spine are eliminated; all gymnastic exercises are alternating with relaxation exercises; introduce exercises to strengthen the neck muscles using resistance exercises and for maintenance of the head. Self–massage of the neck is recommended. These exercises helped to improve mobility of the neck and reduce pain when students bended and turned their heads.

The results of our study are related in many ways to research provided by I. Kotesheva, M. Repnevska et al. Mobility of the cervical spine in the experimental group is presented in Table 1.

Table 1

The results of the measurements of motion in the cervical spine of the students in the control group corresponding to a rate (%)

Range of motion (normal)	***Sex***	***At the beginning of the experiment***	***After the experiment***
Bending (60°)	B	37,5	50,0
	G	30,0	60,0
Extension (70°)	B	62,5	75,0
	G	50,0	70,0
Incline toward (45°)	B	50,0	75,0
	G	50,0	70,0
Maximum rotation	B	37,5	62,5
	G	30,0	50,0

In the experimental group of students during visual studies of motion in the cervical spine at the beginning of an experiment indicated that bending is normal (chin touched sternum) among 30,0 % of girls and 37,5 % of boys; extension (horizontal position of nape) – among 50,0 % of girls and 62,5 % of boys; incline toward (auricle touched shoulder) – among 50,0 % of girls and 50,0 % boys. The maximum rotation of chin touched the acromion only among 30,0 % of girls and 37,5 % boys. Summarizing the results of measuring the range of motion in the cervical spine at the beginning of the experiment, we can say that the majority of students had serious deviation from the generally recognized rules of motion in the cervical spine.

After the experiment, 50,0 % of boys were able to touch chest by the chin and take chin to the horizontal position of the neck (75,0 %), which is an evidence of normal function of flexion and extension. Bending among 60,0 % of girls and extension among 70,0 % of girls of the cervical spine in the neck were normal; at maximum rotation chin touched the acromion among 62,5 % of boys and 50,0 % of girls.

Range of motion in the cervical spine in the control group is presented in Table 2.

Table 2

The results of the measurements of motion in the cervical spine of the students in the control group corresponding to a rate (%)

Range of motion (normal)	***Sex***	***At the beginning of the experiment***	***After the experiment***
Bending (60°)	B	37,5	50,0
	G	30,0	40,0
Extension (70°)	B	62,5	62,5
	G	50,0	60,0
Incline toward (45°)	B	50,0	62,5
	G	50,0	60,0
Maximum rotation	B	37,5	50,0
	G	30,0	40,0

In the control group after the experiment the normal function of bending was recorded among 50,0 %, extension among 62,5 % of boys; respectively, girls – 40,0 % and 60,0 %. Head tilt was normal among 62,5 % of boys and 60,0 % of girls; maximum rotation among 62,5 % of boys and 50,0 % of girls. As you can see, according to the results of the research after the experiment better performance of motion in the cervical spine was observed in the experimental group of students.

Studying the method of complex effects in osteochondrosis D. Yakovenko [4] recommended organizing exercises that depend on the goals in a way that included general developmental exercises; special strength exercises for strengthening of back muscles, abdominal and leg press. He paid special attention to the development of flexibility and mobility in shoulder joints. To determine the effectiveness of the proposed method was carried out a pedagogical experiment in which were involved students in the special medical group. According to the study students noted increased mobility of in all parts of the spine. While organizing exercises in spinal osteochondrosis it is necessary to use relaxation exercises muscles to improve stability of the vestibular apparatus, coordination, dynamic exercises for all muscle groups, special breathing exercises,

exercises to strengthen the muscles of the neck and torso. Analyzing results of the research I. Kotesheva, M. Repnevska, D. Yakovenko and our own research we can see that special set of exercises in combination with massage – compress are more effective than traditional methods, which are used in cases of cervical spinal osteochondrosis.

Conclusions. The use of orthopedic research methods and interviews showed greater efficiency in normalization of motion in the cervical spine among students who did exercises according to our methodology, based on sets of exercises performed individually selected for girls and boys, along with using classical techniques of massage and self-massage anesthetic honey massage-compress in the neck region.

Prospects for further research are in developing a comprehensive program of physical education for students with cervical spinal first and second osteochondrosis degree.

References

1. Hreyda, B. P., Voynarovskyi, A. M., Bychuk, O. I, Hreyda, N. B. (2004). *Likuvalna fizychna kultura pry osteokhondrozakh khrebta* [Curative physical culture among the ill with spine osteochondrosis]. Lutsk: Vezha.

2. Kotesheva, I. A. (2002). *Ozdorovitelnaya metodika pri osteokhondroze. Rekomendatsii spetsialista* [Curative medicine among the ill with osteochondrosis. Recommendations of a specialist]. Moscow: Eksmo.

3. Repnevska, M. S., Filatova-Kucherak, H. P., Korenevska, O. M. (2010). *Metodika likuvalnoi fizychnoi kultury pry osteohondrozi khrebta u studentiv* [Methodology of curative physical culture among students with spine osteochondrosis]. Donetsk: DonNTU.

4. Yakovenko, D. V. (2008). Metodyka kompleksnoho vozdeystviya pri profilaktike osteokhondroza u studentov spetsialnykh meditsinskikh grupp [Methodology of complex influence in case of osteochondrosis prophylaxis among students of special medical groups]. *Uchenye zapiski Universiteta imeni P. F. Lesgrfta, 9 (43),* 113–117.

5. Carney, R., Freedland, K. (2008). Depression in patients with coronary heath disease. *Am. J. Med., 121*, 20–27.

6. Gatchel, R. J., Gardea, M. A. (1999). Lower back pain: psychosocial issues. Their importance in predicting disability, response to treatment and search for compensation. *Neurologik clinics*, *17*, 149–166.

7. Knapic, A., Saulicz, E., Kuszewski, M., Plinta, R. (2009). An analysis of relations between a self-assessment of health and active life-style. *Med. Sport, 13 (1)*, 17–21.

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