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Parameters Of Spine Mobility In Wrestlers-Veterans Of Sports With Osteochondrosis Of Lumbar Sacral Division Of The Spine.

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ABSTRACT

The purpose of the current study is to study the parameters of the biogeometric profile of spine of wrestlers - sports veterans suffering from lumbar sacral osteochondrosis to further develop a complex program of physical rehabilitation. The study was attended by 34 athletes veterans of high qualification, aged 36-45. To conduct research the contingent of the investigated was divided into two groups: main -19 people and control - 15 people. The morphofunctional features of the group were homogeneous. The survey results of index of movement of the spine backwards and forwards in the sagittal plane, left and right in the frontal plane, and Schober's test and Tomayer's test in both groups showed a statistically significant reduction of performance compared to conventional standards ($p < 0.05$), which has proved stage I and II of osteoarthritis of the lumbosacral spine.

Keywords: Osteochondrosis wrestlers - veterans of sport, spinal mobility, Schober's test, Tomayer's test.

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INTRODUCTION

Among the most common diseases in athletes-veterans, a significant place is occupied by osteochondrosis of the spine, primarily due to an increase in the amount of workload associated with the intensity of training loads in the past. Osteochondrosis, as the clinical form of the disease, is more common in athletes of those kinds of sports, where there is a permanent overload of the spine caused by micro-and macrotrauma. According to G.S. Yumashev (1977), V.S. Martynihin (2015) the lumbar spine accounts for 60% of injuries [5,6].

After the termination of active training, veterans-wrestlers have progressing degenerative-dystrophic processes of the spine, which can be explained by a sharp decrease in the volume of physical activity, a changed motor stereotype, and adverse social factors. In this regard, the problem of timely and effective restorative treatment of athletes - veterans in order to preserve their labor and social activity, improve their health, and improve their quality of life becomes a topical issue. Complex physical rehabilitation is an integral part of the improvement of the leading athletes who have stopped active sports training, their stage of retirement from higher achievements [8,11].

Recent years data on the effectiveness of treatment and prophylaxis in spinal osteochondrosis have shown that using a comprehensive approach to physical rehabilitation, one can not only resist osteochondrosis but also successfully treat it. With osteochondrosis of the lumbosacral spine are increasingly used non-drug treatments, which include various combinations of therapeutic physical training, massage and physical therapy [9,12, 13]. It remains to be seen what actions and their combination are more rational to use in one form or another of the disease depending on the clinical manifestations of osteochondrosis. The use of the complex of physical rehabilitation, which includes physical therapy, massage, postisometric relaxation, physiotherapy, hydrocolonotherapy, traction methods of treatment can significantly restore the functional state of athletes-veterans with osteochondrosis of the lumbar spine and improve the quality of their life [1-4]. However, providing some methodological recommendations, these authors do not offer programs for the integrated use of physical rehabilitation equipment for veterans of the sport suffering from lumbar sacral spinal osteochondrosis. To develop and apply a rehabilitation program, the rehab team must establish a rehabilitation diagnosis that consists of evaluating the biomechanical parameters of the spine, functional indicators of various systems of organism and patient quality of life. Clinical and anamnestic data, examination and palpation allow to estimate antiquity of the pathological process, main complaints, duration of pain syndrome; to assess the general condition and physical development of the patient, the condition of the tissues, according to the clinical signs to establish the stage of the disease; to assess the mobility of the spine using standardized methods and tests [5, 6]. Unfortunately, the works devoted to the complex approach to physical rehabilitation of wrestlers - veterans of sports, patients with osteochondrosis of the lumbar-sacral division of the spine for use in the training moving mode is not enough, they are distinct in nature, which determined the purpose of our work.

Purpose of the research:

To determine the parameters of the biogeometric profile of spine of wrestlers - sports veterans suffering from lumbosacral osteochondrosis to further develop a complex program of physical rehabilitation.

METHODS AND ORGANIZATION

Participation and design of study. The selection and examination of the subjects were conducted in the conditions of the problematic scientific laboratory of the Kharkov State Academy of Physical Culture. Formation of groups was carried out by careful questioning and review of patients, studying their clinical and anamnestic data, the general condition of the patient's tissues, and the biomechanical profile of the lumbar spine, in accordance with their inclusion criteria and design of investigation. All participants in the study received full information about the plan of physical examination rehabilitation and physical examination, and agreed to participate in the study.

The mobility of the lumbosacral division of the spine was studied by us according to the method of M. Weiss and A. Zembatoy [5,10].

Bending and unbending movements in the sagittal plane. During unbending measurement points are xiphoid process of the sternum and pubic symphysis. The difference between the starting position and the maximum inclination is in the normal conditions of 7-8 cm.

Movement with lateral inclinations in the front plane. Initial sitting position. Measure the distance from the highest point on the top of the ridge of the iliac bone to a vertical point above it on the last edge. The difference between the starting position and the maximum lateral inclination is 5-6 cm in normal conditions. Mobility of the lumbar spine was studied using tests of Schober: investigated person makes a incline forward with straightened knees, after which spends the second dimension. The difference in healthy people averaged 7 cm. Test of Tomayer serves to characterize the general possibility of the forward tilt in the sagittal plane. Measure the distance from the tip of the thumb of the hand to the floor.

The study was attended by 34 athletes - veterans aged 36-45 years, the kind of sport - the fight, namely sambo 14 people, judo 20 people. Sports qualification of athletes: Master of Sport - 25 people, Candidate of Master of Sport - 9 people. Clinical signs diagnosed the first stage of osteochondrosis of the lumbosacral division of the spine, according to the severity of vertebrogenic pain syndrome (according to I.P. Antonov), all the wrestlers - veterans were diagnosed with the I-II degree of pain syndrome. To conduct research the contingent of the people was divided into two groups: main (MG) 19 people and control (CG) 15 people. Disease duration of MG was $9,01 \pm 0,43$ years, of CG - $9,37 \pm 0,55$; periods of exacerbation in MG and CG were observed 1.47 ± 0.11 and 1.75 ± 0.11 times respectively .

Statistical analysis: Statistical data processing was performed using a statistical package STATISTICA 13.0 (StatSoft). The average arithmetic value was calculated - \bar{X} ; standard deviation- δ ; dispersion - D; Error of average arithmetic value - $\pm m$. Since the division of all the investigated quantitative indicators had no significant differences from the normal (according to the Kolmogorov-Smirnov criterion), the Student's parametric criterion (t) was used for related and unrelated samples. Statistically significant differences were considered at $p < 0,05$

RESULTS

According to the morphofunctional features in the groups studied and when compared with the proper indicator of statistically significant differences were not noted. Table 1 provides morpho-functional indicators of wrestlers - veterans of sport.

Table 1: Morphofunctional Indicators Of Wrestlers - Veterans Of Sports Of The Mg And Cg Groups

Indexes	MG (n = 19)	CG (n = 15)	Appropriate indicator	P
	$\bar{X} \pm m$	$\bar{X} \pm m$		
Age, years	41.10 ± 0.86	41.25 ± 0.85	-	$> 0,05$
Height, cm	173.73 ± 1.75	173.81 ± 2.35	-	$> 0,05$
Weight, kg	70.94 ± 2.01	72.75 ± 1.75	-	$> 0,05$
Body mass index , kg / cm ²	23.45 ± 0.44	24.16 ± 0.61	18.5-24.99	$> 0,05$
Chest excursion , cm	$5,02 \pm 0,12$	5.12 ± 0.18	6-8	$> 0,05$
Dynamometer, kg				
- right	51.84 ± 1.20	51.56 ± 1.29	55-58	$> 0,05$
- left	44.31 ± 1.15	43.68 ± 1.27	50-53	$> 0,05$
Life lung capacity, Jr.	4889.47 ± 81.96	4578.12 ± 84.16	4700	$> 0,05$
Stange test, sec	67.37 ± 2.13	60.51 ± 2.95	60-90	$> 0,05$
Henchy test , sec	47.31 ± 1.59	44.25 ± 1.99	30-45	$> 0,05$
Statistical balancing , sec	24.73 ± 1.51	19.93 ± 1.75	25	$> 0,05$

In the initial examination, it was important to assess the functional status of the spine. According to the biogeometric study, the parameters of the amplitude of the spine movement forward and backward in the sagittal plane, left and right in the frontal plane, and Shober's breakdown and Tomayer's breakdown were used to determine the mobility of the lumbar spine. In wrestlers - sports veterans of the MG average value of the spine forward and back acquired value of 5.59 ± 0.16 cm and 5.41 ± 0.12 cm respectively; in the sagittal plane to the right and to the left - 3.43 ± 0.06 cm and 3.27 ± 0.10 cm respectively. The mean value of the Schober test was 3.92 ± 0.20 cm, and Tomayer's test was 24.68 ± 0.60 cm. In the wrestlers - veterans of the CG sport, the average value of the spine mobility forward and backward was 5.59 ± 0.16 cm and 5.11 ± 0.10 cm respectively; in the sagittal plane to the right and to the left - 3.58 ± 0.04 cm and 3.35 ± 0.08 cm respectively. The mean value of the Schober test was 3.97 ± 0.25 cm, Tomayer's test was 25.47 ± 0.47 cm.

It should be noted that when comparing between the groups, the parameters of the functional state of the spine of veterans of sport with osteochondrosis of the lumbar-sacral division of the spine did not obtain statistically significant difference, but would be reduced in comparison with generally accepted norms (Table 2).

Table 2: Comparative characteristic of the parameters of the functional state of the spine of the wrestlers - veterans of sport of MG and CG with osteochondrosis of the lumbar sacral division of the spine and the proper index

Indexes	MG (n = 19)	CG (n = 15)	Aproprate indicator	p ¹	p ²	p ³
	X ± m	X ± m				
Movement of the spine forward, cm	5.59 ± 0.16 * +	5.59 ± 0.16 #	7-8	> 0,05	<0.05	<0.05
Movement of the spine back, cm	5.41 ± 0.12 * +	5.11 ± 0.10 #	7-8	> 0,05	<0.05	<0.05
Mobility of the spine to the right, cm	3.43 ± 0.06 * +	3.58 ± 0.04 #	5-6	> 0,05	<0.05	<0.05
Mobility of the spine to the left, cm	3.27 ± 0.10 * +	3.35 ± 0.08 #	5-6	> 0,05	<0.05	<0.05
Shober test, cm	3.92 ± 0.20 * +	3.97 ± 0.25 #	7	> 0,05	<0.05	<0.05
Tomayer's Sample, cm	24.68 ± 0.60 * +	25.47 ± 0.47 #	0	> 0,05	<0.05	<0.05

Note. * p₁ - the statistical significance of the differences between the MG-CG; + p₂ - statistical significance of disagreements between MG - an appropriate indicator; # p₃ - the statistical significance of the differences between the CG - an appropriate indicator

DISCUSSION

Based on the analysis of quantitative indicators biogeometric profile of posture of wrestlers – veterans, were detected changes in mobility of the spine in patients of both groups confirmed statistical significance compared to the appropriate indicator. Confirmed data of F.S. Favvaz (2012), V.V. Kormiltseva (2014), Sohob Bahjat Mahmoud Almavazhdeh (2014) that the basis of various posture disorders in this pathology is the lack of motor activity of the spine and the weakening of the muscles that hold the spine, with limitation of mobility in the joints. Supplemented scientific data of I.P. Antonov (1998), V.A. Radchenko (2004), A.N. Poluvoda (2007), E.S. Mykhailina (2010) about the amplitude of spinal movements with lumbar localization of osteochondrosis [7, 9, 12].

In conclusion, our study in this direction suggests that the use of hydrocolonosis and traumatic exercises in water should improve the normalization of mobility of the affected vertebral-motor segment and activate blood circulation processes in the spine. This contradicts the opinion of many authors about the positive effect of physical exercises, massage, hydrocolonotherapy in the treatment of patients with this pathology of V.A. Yepifanova (2008), A.M. Aksenova (2009), Yu.M. Furman, M.. Berezhnaya (2012) [7, 9, 12].

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