POSSIBILITIES OF CORRECTION OF VERTEBROGENIC DISORDERS AS A COMPONENT OF HIP-SPINE SYNDROME IN ELDERLY PERSONS WITH OSTEOARTHRITIS OF THE HIP AND SARCOPENIC OBESITY BY MEASURES OF PHYSICAL THERAPY

МОЖЛИВОСТІ КОРЕКЦІЇ ВЕРТЕБРОГЕННИХ ПОРУШЕНЬ ЯК КОМПОНЕНТА КОКСО-ВЕРТЕБРАЛЬНОГО СИНДРОМУ В ОСІБ ПОХИЛОГО ВІКУ З ОСТЕОАРТРОЗОМ КУЛЬШОВОГО СУГЛОБА ТА САРКОПЕНІЧНИМ ОЖИРІННЯМ ЗАСОБАМИ ФІЗИЧНОЇ ТЕРАПІЇ

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Abstracts

Purpose – to determine the effect of a physical therapy program on the vertebrogenic symptoms of hip-spine syndrome in elderly people with osteoarthritis of the hip, which occurs against the background of sarcopenic obesity.

Material. 68 elderly people with osteoarthritis of the hip and sarcopenic obesity and 36 of their healthy peers (control group) were examined. Representatives of the comparison group (33 people) corrected the signs of osteoarthritis according to the clinical guideline "Osteoarthrosis". The representatives of the main group (35 people) were engaged in a physical therapy program for six months using therapeutic exercises, functional training, Proprioceptive Neuromuscular Facilitation, massage, kinesiological taping; course of shock wave therapy, nutrition correction, patient education. The effectiveness of the program was evaluated by the dynamics of the results of questioning, examination, palpation, flexibility of the spine (Schober, Thomayer, Sedin tests), standing dynamometry, Oswestry Disability Index.

Results. In elderly patients with osteoarthritis of the hip and sarcopenic obesity, signs of hip-spine syndrome were determined in the form of pain syndrome in the hip and lower back, limitation of their mobility (according to the results of questioning, examination, palpation), a decrease in the flexibility of the spine (according to the tests of Schober, Thomayer, Sedin), deterioration of the strength of trunk extensor muscles (according to static dynamometry), which negatively affected the performance of activities of daily life (according to the Oswestry Disability Index). The tested comprehensive program of physical therapy revealed a statistically significant improvement in the condition of patients due to the impact on the components of the hip-spine syndrome due to the reduction of pain and the improvement of the mobility of the lumbar and hip, the improvement of the flexibility of the spine, the increase of standing strength, the expansion of motor functional capabilities when performing various activities in comparison with initial indicators for all studied parameters ($p<0,05$). Patients who underwent rehabilitation according to the standard program for the correction of osteoarthritis achieved a statistically significant improvement relative to the initial state according to the studied indicators of the hip-spine syndrome ($p<0.05$), however, less pronounced compared to the tested program, created from the position of correcting the features of comorbidity and geriatric status.

Conclusions. Elderly patients with osteoarthritis of the hip and sarcopenic obesity need the development of physical therapy programs taking into account and correcting the specifics of the hip-spine syndrome, which increases the overall effectiveness of rehabilitation.

Key words: physical therapy, sarcopenia, obesity, osteoarthritis, hip.

Мета – визначення впливу програми фізичної терапії на вертеброгенні ознаки коксо-вертебрального синдрому у осіб похилого віку з остеоартрозом кульшових суглобів, що перебігає на фоні саркопенічного ожиріння.

Матеріал. Обстежено 68 осіб похилого віку з остеоартрозом кульшового суглоба та саркопенічним ожирінням та 36 їх здорових однолітків (контрольна група). Представники групи порівняння (33 особи) корегували ознаки остеоартрозу згідно з клінічною настановою «Остеоартроз». Представники основної групи (35 осіб) упродовж шести місяців займались за програмою фізичної терапії із застосуванням терапевтичних вправ, функціонального тренування, Proprioceptive Neuromuscular Facilitation, масажу, кінезіологічного тейпування; курсу ударно-хвильової терапії, корекції харчування, освіти пацієнтів. Ефективність програми оцінювали за динамікою результатів розпитування, огляду, пальпації, гнучкості хребта (проби Шобера, Томаєра, Сєдіна), становою динамометрією, Oswestry Disability Index.

Результати. У пацієнтів похилого віку з остеоартрозом кульшових суглобів та саркопенічним ожирінням визначено ознаки коксо-вертебрального синдрому у вигляді больового синдрому у кульшових суглобах та попереку, обмеження їх рухомості (за результатами розпитування, огляду, пальпації), зменшення гнучкості хребта (за пробами Шобера, Томаєра, Сєдіна), погіршення сили м'язів-розгиначів тулуба (за становою динамометрією), що негативно впливало на виконання активностей повсякденного життя (за Oswestry Disability Index). Апробована комплексна програма фізичної терапії виявила статистично значуще покращення стану пацієнтів через вплив на компоненти коксо-вертебрального синдрому за рахунок зменшення болю та покращення мобільності попереку та кульшових суглобів, покращення гнучкості хребта, збільшення станової сили, розширення рухових функціональних можливостей у разі виконання різних активностей порівняно із вихідними показниками за всіма досліджуваними параметрами ($p<0,05$). Пацієнти, які проходили реабілітацію за стандартною програмою корекції остеоартроза, досягнули статистично значущого покращення стосовно вихідного стану за досліджуваними показниками коксо-вертебрального синдрому ($p<0,05$), проте менш вираженого порівняно з апробованою програмою, створеною з позиції корекції особливостей коморбідності та геріатричного статусу.

Висновки. Пацієнти похилого віку з остеоартрозом кульшових суглобів та саркопенічним ожирінням потребують розробки програм фізичної терапії з урахуванням та корекцією специфіки коксо-вертебрального синдрому, що підвищує загальну ефективність реабілітації.

Ключові слова: фізична терапія, саркопенія, ожиріння, остеоартроз, кульшовий суглоб.

Introduction. Osteoarthritis (OA) is the most common disease of the musculoskeletal system, as well as one of the main causes of premature disability and disability [1; 10]. This is a heterogeneous group of diseases of different etiology with similar biological, morphological, clinical manifestations and result, which is based on damage to all components of the joint, primarily cartilage, as well as subchondral bone, synovial membrane, ligaments, capsule and peri-articular muscles [11; 14]. The frequency of detection of OA increases with age – in people over 60 years old, it is diagnosed in 97% of cases [1].

Obesity is a nosological condition that adversely affects the course of OA, as it increases the mechanical load on the joints and causes the production of pro-inflammatory biologically active substances [10]. In addition, obesity is an additional factor complicating the course of numerous somatic diseases, also causing limitation of mobility and deterioration of well-being [2; 9].

In recent decades, coxarthrosis of the hip (the second most common lesion after the knee) has been studied as a component of hip-spine syndrome (HSS). Hip-spine syndrome is an etiopathogenetically and clinically complex symptom resulting from combined pathology of the lumbar spine and hip. Hip-spine syndrome was first described by C. Offierski and I. Macnab in 1983, since the expediency of considering degenerative-dystrophic diseases of the hip in the complex of the anatomic-physiological triangle «lumbar spine – pelvis – hip» [13].

The root cause of HSS is debatable; accordingly, its forms are distinguished due to the pathology of the spine, hip and combined [7; 8]. HSS due to diseases of the hip is manifested by flexion-adduction-external rotation contracture with functional shortening of the lower limb, which, in turn, leads to secondary functional deformations of the spine (scoliosis, hyperlordosis), imbalance of the back muscles and functional blockades in the lumbar vertebral-motor segments, which

creates conditions for the development of the degenerative-dystrophic process. A vicious circle arises: hip – spine – hip. This mechanism is confirmed by the fact that virtually all patients with coxarthrosis complain the lower back pain [12; 15].

Total hip arthroplasty is a radical method of correction that eliminates the root cause of HSS – the difference in the length of the limbs, elimination of contracture of articular and peri-articular structures, elimination of pain syndrome and its negative impact on motility and quality of life [2]. However, despite the presence of grade III osteoarthritis according to radiological signs, the clinical course and wishes of patients do not always meet the criteria for indications for endoprosthetics. This determines the importance of long-term non-pharmacological correction of pain and motor functioning, especially in persons of older age groups with numerous comorbid and polymorbid pathologies [4].

It is the means of physical therapy that meet the requirements of safety, physiological effect, long-term stable result, influence on various body systems, improvement of functioning and mobility, quality of life [2; 5; 9], which justifies the search for special approaches in the development of individual programs of physical therapy, taking into account the peculiarities of gerontological pathology.

The purpose of the study is to determine the impact of the physical therapy program on the vertebrogenic symptoms of hip-spine syndrome in elderly people with osteoarthritis of the hip, which occurs against the background of sarcopenic obesity.

Material and methods. 104 elderly people participated in the longitudinal prospective study.

Inclusion criteria: advanced age according to the criteria of the World Health Organization (60–75 years); hip OA II stage according to the classification of N.S. Kosynska, II–III degrees according to the radiological classification of Kellgren–Lawrence; sarcopenic obesity defined by body mass index (≥30) in combination with sarcopenia according to the criteria of the European Working Group on Sarcopenia in Older People (EWGSOP) (2019) – reduced skeletal muscle strength relative to normative age-gender results of wrist dynamometry and deterioration of skeletal muscle function according to the results of the Short Physical Performance Battery test [4]; in the anamnesis – a diagnosed degenerative-dystrophic process of the lumbar spine; consent to active participation in the implementation of recommended restorative interventions and/or examinations.

Exclusion criteria: secondary hip OA; osteoarthritis of the knee joints or the contralateral hip above the 1st stage and/or in the stage of exacerbation; the presence of severe somatic concomitant pathology affecting motor functions (neurological, traumatological, rheumatic, etc.); oncological diseases; exacerbation of existing chronic somatic pathology at the time of the study; the presence of a pain syndrome caused only by pathology of the spine; all variants of dysplastic scoliosis and spondylolisthesis; spine injuries; dysplasias and abnormalities of the spine development, capable of causing its deformation or pain syndrome.

The control group (CtrlG) consisted of 15 men and 21 women aged 67.9±0.8 years, who were not diagnosed with hip OA and sarcopenic obesity.

A group of individuals with hip OA and sarcopenic obesity was divided into two parts in a blind randomized manner.

The comparison group (CG) consisted of 14 men and 19 women aged 68.3±1.1 years, in whom the correction of hip OA symptoms took place according to the standard scheme of treatment and rehabilitation according to the clinical guideline “Osteoarthrosis”, which involves the predominant use of passive means and does not regulate features related to the problem of a comprehensive approach to correcting the geriatric status of patients [1].

The main group (MG) consisted of 16 men and 19 women aged 66.9±1.5 years who underwent treatment and a physical therapy program created taking into account not only clinical guidelines, but also the comorbidity of hip OA and CO, the results of which are presented in this work.

The developed program of physical therapy lasted 6 months. Its purpose was: reduction of pain

and discomfort in the hip and back; improvement of the amplitude of movements in the hip, joints of the lower limbs, spine; optimization of general mobility and motor stereotype; decrease in body weight; facilitating activities of daily living; improvement of geriatric status, in particular – reduction of the risk of falling and manifestations of malnutrition; improvement of the psycho-emotional state, and – as a result – improvement of the quality of life.

The tested program of active functional physical therapy was implemented in outpatient settings (rehabilitation center) and in the form of telemedicine (telerehabilitation). It included kinesitherapy, proprioceptive neuromuscular facilitation of the muscles of the lower limbs and lower back; massage, kinesiological taping of hip, thigh and lower back muscles; course of hip shock wave therapy, nutritional correction, education of patients and their family members (principles of balanced nutrition, prevention of fall risk, independent management of pain and movement disorders, support of optimal and individual safe training and household motor activity).

The basis of kinesitherapy was performing therapeutic exercises of various orientations (for the development of strength, flexibility, endurance, coordination qualities, balance), working out the skills of normal motor stereotype and gait; functional training of movements of the lower extremities with imitation of activities of daily life, taking into account limitations caused by OA, obesity and age-related changes; exercises for back muscles. Rehabilitation movement classes were held for two weeks at the rehabilitation center daily, then three times a week – in the format of telemedicine (telerehabilitation), independent classes with periodic supervision by a physical therapist. Patients received courses of massage: general, lower limbs and back, the purpose of which was to improve blood supply and trophicity of soft tissues of the hip and skeletal muscles to accelerate the overcoming of muscle weakness; improvement of elasticity of muscles, ligaments, tendons; reduction of unpleasant sensations after rehabilitation training; improvement of psycho-emotional state. To reduce discomfort, swelling, and hip instability, kinesiological taping of the buttock, thigh muscles, and lumbar spine was performed. Training on the principles of nutrition included recommendations for overcoming malnutrition, taking into account the specific needs of the elderly with sarcopenia and the need to reduce body weight: increase protein intake to 1–1.5 g per kilogram of body weight, consume vitamin D and receive additional insolation by staying on outdoors; increase the consumption of vegetables and fruits; normalize the daily caloric intake by reducing the amount of carbohydrates in the daily diet. Patients were also taught principles of fall risk prevention (creating a safe environment), hip sparing strategies in motor activities, self-monitoring of health status. In the process of physical therapy, the individual short- and long-term rehabilitation goals defined in all domains of the International Classification of Functioning, Disability and Health were gradually achieved.

The condition of the examined patients of the comparison group and the main group was evaluated dynamically before (pre-test) and after (post-test) the application of the physical therapy program according to indicators that characterize the functioning of the spine.

The course of HSS was characterized as a combination of clinical signs of hip and lower back damage.

When taking anamnesis, complaints were determined: pain at rest and during movements in the hip and lumbar region of the spine; limitation of mobility in the hip and lumbar spine; impairment of activities of daily living (ADL) associated with hip and lumbar spine dysfunction; radiation of pain to the anterior-lateral surface of the thigh (hip area) or the posterior-lateral surface of the lower limb (along the course of the sciatic nerve).

During the examination, the difference in the length of the lower limbs, antalgic forced position of the body, lameness, asymmetric position of the spine and pelvis relative to the central axis, and the need for auxiliary means of movement were determined.

During palpation, the tenderness of the paravertebral zones and spinous processes of

the lumbar vertebrae, the tenderness of the exit point of the sciatic nerve on the buttock, and tenderness in the area of the greater trochanter of the femur were determined. Lasegue and Bonnet symptoms were also determined.

The flexibility of the spine was characterized by tests of Schober (mobility of the lumbar spine in the sagittal plane), Thomayer (general mobility of the spine), Sedin (mobility of the spine in the sagittal plane).

To determine the strength of the muscles that extend the trunk, static dynamometry was performed.

Limitation of activity and participation due to spinal dysfunction was carried out according to the Oswestry Disability Index (ODI), which consists of 10 sections, each of which has 6 answer options, which allow you to assess the intensity of pain on a 6-point scale (0 – there is no limitation in functioning due to pain, 5 – severe functional limitations due to back pain) [6].

The study was conducted taking into account the principles of the Helsinki Declaration of the World Medical Association "Ethical principles of medical research with the participation of a person as an object of research". Informed consent was obtained from all elderly subjects with hip OA and sarcopenic obesity participating in the study. The research protocol was discussed, approved and approved at the meeting of the Bioethics Commission of Vasyl Stefanyk Precarpathian National University.

The average value and standard deviation (M±SD) were calculated. Reliability of P=95% (probability of error 5%) was assumed. Data processing was carried out using the Statistisa 10 software package.

Research results. The results of the initial examination showed that the course of HSS in the elderly is characterized by pain in the lower back, limitation of its mobility, a decrease in the flexibility of the spine, and as a result, deterioration of ADL against the background of the classic clinical picture of hip OA. It should be noted that some representatives of CtrlG, despite the inclusion and exclusion criteria in the study, also gave single positive answers regarding the signs of vertebrogenic pain syndrome.

In particular, all examined patients of both groups complained of pain during movements in the hip, irradiation of pain in the anterior-lateral surface of the thigh, limitation of the hip mobility, ADL impairment associated with hip dysfunction (Table 1). The signs that characterized the dysfunction of the lumbar spine were defined as lower back pain when moving (MG – 60.6%, CG – 54.3%), limitation of the lower back mobility (CG – 84.8%, MG – 80, 0%), ADL impairment associated with low back dysfunction (CG – 66.7%, MG – 74.1%).

Table 1

Dynamics of spinal flexibility indicators in elderly people with hip OA and sarcopenic obesity under the influence of a physical therapy program (M±SD)

Complaints	CtrlG (n=36), % (absolute number)	MG (n=33), % (absolute number)		CG (n=35), % (absolute number)	
		Pre-test	Post-test	Pre-test	Post-test
Pain in the hip at rest	0	18.2 (6)	0	20.0 (7)	0
Lower back pain at rest	0	0	0	0	0
Pain during hip movements	0	100 (33)	63,6 (21)	100 (35)	28.6 (10)
Lower back pain when moving	16.7 (6)	60.6 (20)	36.4 (12)	54.3 (19)	0
Irradiation of pain in the anterior-lateral surface of the thigh	0	100 (33)	60.6 (20)	100 (35)	28.6 (10)
Irradiation of pain in the posterior-lateral surface of the lower limb	0	9.1 (3)	0	11.4 (4)	0
Limitation of the hip mobility	13.9 (5)	100 (33)	78.8 (26)	100 (35)	34.4 (12)
Limitation of the lower back mobility	8.3 (3)	84.8 (28)	36.4 (12)	80.0 (28)	17.1 (6)
ADL impairment associated with hip dysfunction	0	100 (33)	75,8 (25)	100 (35)	20,0 (7)
ADL impairment associated with low back dysfunction	5.6 (2)	66.7 (22)	48.5 (16)	71.4 (25)	0

During the examination of the elderly, the following changes were found: the difference in the length of the lower limbs (CG – 84.8%, OG – 85.7%), forced antalgic position of the trunk (MG – 75.8%, CG – 77.1%), lameness (in all subjects of the main group and the comparison group), asymmetry of the spine axis relative to the central line (CtrlG – 13.9%, MG – 84.8%, CG – 88.6%), asymmetry of the pelvis relative to the central position (CtrlG – 8,3%, MG – 90.9%, CG – 88.6%). 45.5% of CG people and 42.9% of MG people used mobility aids.

During palpation, pain was determined in the following areas: spinous processes of the lumbar vertebrae (CG – 60.6%, MG – 62.9%), lumbar muscles (CtrlG – 8.3%, CG – 45.5%, MG – 40.0%), the projection of the exit point of the sciatic nerve on the buttock (CG – 39.4%, MG – 42.9%), the greater trochanter of the femur (CG – 60.6%, MG – 68.6%). Positive symptoms of Lasegue (CG – 45.5%, MG – 68.6%) and Bonnet (CG – 36.4%, MG – 48.6%) were also determined.

When analyzing the spinal flexibility indicators, a deterioration was determined compared to the CtrlG indicator ($p<0.05$) according to the results of the Schober test in CG – by 47.2%, MG – by 42.7%; Thomayer test samples in CG – by 98.3%, OG – by 96.4%; Sedin test when leaning forward in CG – by 40%, MG – by 36.6%, when leaning back in CG – by 30.9%, MG – by 24.4% (Table 2).

At the initial examination, the standing strength of the patients was low, which, in particular, can be explained by the fact that the performance of this examination method was limited by pain in the lower back and hip joint. Deterioration relative to the CtrlG indicator in CG men was 35.4%, MG – 38.4%; in women, respectively, 25.9% and 21.5% ($p<0.05$) (Fig. 1). Normal back extensor muscle strength is essential for safe and comfortable activities of daily living.

When determining the limitations of performing various activities due to back pain according to the Oswestry Disability Index in elderly people with hip OA and sarcopenic obesity, violations were determined according to all its subscales (Table 2). The greatest severity of limitations in CG and MG persons was noted in the evaluation of the personal care, lifting, walking, social subscales. The level of activities of CtrlG individuals corresponded to the characteristics of minimal impact of back pain on ADL performance; CG and MG scores were three and a half times worse, at the level of severe impairment, pain significantly affected daily life (travel, self-care, social life, sexual activity and sleep).

According to the results of the initial examination, the results of the CG and MG patients did not differ statistically significantly from each other, which indicated the homogeneity of the research group and made it possible to evaluate the effectiveness of the developed physical therapy program. Determination of the presence of signs of HSS led to the inclusion in the developed program of a block of therapeutic tasks with an emphasis on the lower back – exercises, kinesiological taping, massage.

The subjective improvement of the condition of the patients according to the signs of HSS was

Table 2

Dynamics of spinal flexibility indicators in elderly people with hip OA and sarcopenic obesity under the influence of a physical therapy program (M±SD)

Tast, sm	CtrlG (n=36)	CG (n=33)		MG (n=35)	
		Pre-test	Post-test	Pre-test	Post-test
Schober	8.24±0.53	12.13±0.81*	10.16±0.75*	11.76±0.90*	9.08±0.52°□
Thomayer	10.15±0.83	20.13±2.11*	17.23±1.19*°	19.23±1.64*	12.16±1.45°□
Sedin					
lean forward	6.12±0.35	3.67±0.21*	4.51±0.16*°	3.88±0.42*	5.54±0.39°□
lean back	4.50±0.42	3.11±0.23*	3.70±0.32*	3.40±0.16*	4,35±0.10°□

Notes: * – $p<0.05$ – statistically significant difference between the corresponding parameters CtrlG and CG, MG;

° – $p<0.05$ – statistically significant difference between the relevant parameters of examinations before and after physical therapy;

□ – $p<0.05$ – statistically significant difference between the corresponding parameters of CG and MG.

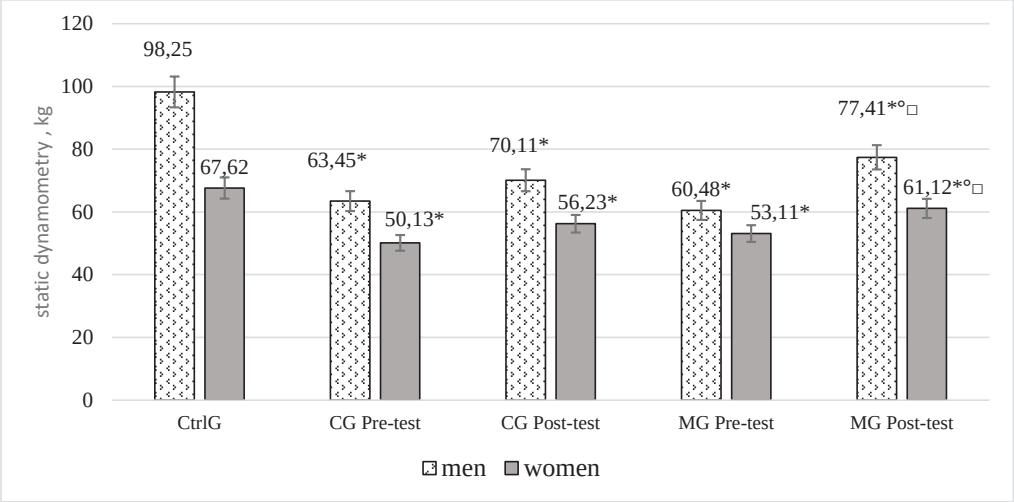

Fig. 1. Dynamics of static dynamometry indicators in elderly people with hip OA and sarcopenic obesity under the influence of a physical therapy program
(* – $p<0.05$ – statistically significant difference between the corresponding parameters CtrlG and CG, MG; ° – $p<0.05$ – statistically significant difference between the relevant parameters of the examinations before and after physical therapy; □ – $p<0.05$ – statistically significant difference between the relevant parameters of CG and MG)

determined in the form of a decrease in complaints during the repeated survey (Table 1). In both groups, there were no complaints such as pain in the hip at rest, lower back pain at rest, irradiation of pain in the posterior-lateral surface of the lower limb. In MG, there were no complaints about lower back pain when moving, ADL impairment associated with low back dysfunction. Other complaints were less common in MG than in CG: pain during movements in the hip – 28.6% and 63.6%, respectively; irradiation of pain in the anterior-lateral surface of the thigh – 28.6% and 60.6% ; limitation of the hip mobility – 34.4% and 78.8%; limitation of the lower back mobility – 17.1% and 36.4%; ADL impairment associated with hip dysfunction – 20.0% and 75.8%.

The visual improvement of the patients' condition was manifested in the disappearance in MG of persons with antalgic forced posture, while in CG it was manifested in 42.9%. Lameness was found in 72.7% of CG individuals and in 31.4% of MG representatives; asymmetry of the spine – respectively in 66.7% and 14.3%, asymmetry of the pelvis – in 60.6% and 17.1%. Mobility aids were used by 30.3% of CG and 14.3% of MG individuals during the re-examination.

During palpation, there was no pain in the lower back muscles in MG subjects (39.4% in CG subjects). Pain in the spinous processes of the lumbar spine was detected in 51.5% of CG persons, in 8.6% of MG; pain at the exit point of the sciatic nerve – respectively in 30.3% and 8.6%; soreness of the large acetabulum – 54.5% and 20%. Positive symptoms of Lasegue and Bonnet were not found in MG individuals, and their prevalence was 39.4% and 30.3%, respectively, in CG representatives.

The improvement of the condition of the spine was determined by increasing its flexibility: according to the Schober test in CG – 16.2%, in MG – 22.8%; Thomayer breakdown, respectively – 14.4% and 36.8%. The increase in the forward bending distance during Sedin's test was 22.9% in CG, 42.8% in MG, and 19% and 27.9%, respectively, in backward bending (Table 2).

The increase in the strength of the spinal extensor muscles according to the results of standing dynamometry in CG was 10.5% in men, 12.2% in women, and 28% and 17% in MG, respectively (Fig. 1).

The dynamics of the Oswestry Disability Index showed an improvement in the performance of

Table 3

Dynamics of Oswestry Disability Index indicators in elderly people with hip OA and sarcopenic obesity under the influence of a physical therapy program (M±SD)

Subscale, points	CtrlG (n=36)	CG (n=33)		MG (n=35)	
		Pre-test	Post-test	Pre-test	Post-test
Pain intensity	0.53±0.03	3.25±0.41*	2.56±0.12*°	3.10±0.25*	1.14±0.12°□
Personal care	1.12±0.11	3.67±0.37*	3.22±0.23*	3.85±0.40*	1.26±0.09°□
Lifting	0.88±0.16	3.42±0.25*	3.07±0.44*	3.57±0.37*	1.08±0.39°□
Walking	1.03±0.10	3.04±0.11*	2.60±0.15*°	2.87±0.45*	1.49±0.25*°□
Sitting	0.23±0.05	2.13±0.30*	1.70±0.18*	2.45±0.21*	0.80±0.05*°□
Standing	0.60±0.08	2.18±0.13*	1.80±0.16*°	2.05±0.11*	0.73±0.05°□□
Sleeping	0.21±0.04	1.87±0.22*	1.23±0.19*	1.20±0.31*	0.75±0.07*°□
Sex	0.56±0.10	2.16±0.15*	1.73±0.20*°	2.50±0.21*	1.15±0.13*°
Social	0.59±0.08	3.08±0.40*	2.73±0.26*	3.23±0.39*	1.12±0.11*°□
Travel	0.48±0.05	3.27±0.11*	2.64±0.17*°	3.09±0.25*	1.50±0.12*°□
Total mark, %	12.46±0.86	56.14±1.12*	46.56±0.75*°	55.82±1.03*	22.04±0.54*°□

Notes: * – $p<0.05$ – statistically significant difference between the corresponding parameters CtrlG and CG, MG;

° – $p<0.05$ – statistically significant difference between the relevant parameters of examinations before and after physical therapy;

□ – $p<0.05$ – statistically significant difference between the corresponding parameters of CG and MG.

activities in CG by 17.1% (remaining at the level of severe impairments), in MG by 60% (moving to the level of moderate impairments) (Table 2).

According to all studied indicators, the parameters of MG during the repeated study were statistically significantly ($p<0.05$) better than not only the initial indicator, but also the parameters of CG.

Discussion. The problem of treating patients with combined degenerative-dystrophic pathology of the hip and spine remains relevant, despite the successes of modern orthopedics and rehabilitation. Its significance is determined by the high frequency of this pathology, which is difficult to diagnose and treat, by the variety of clinical forms and degrees of expressiveness of degenerative-dystrophic lesions of the lumbosacral spine [1; 3]. Such variability may be related to the lack of clear criteria for the verification of HSS, which indirectly confirms the complexity of the pathology for diagnosis, understanding the pathogenesis of this condition and methods of its correction. A predominant role in the development of HSS is played by biomechanical factors caused, in particular, by the vertebral-pelvic relationships [7; 8]. In patients with coxarthrosis, in the majority of observations, the cause of pain syndrome in the lower back is degenerative-dystrophic changes in the vertebral-motor segments, which progress due to biomechanical disorders caused by the pathology of the hip joints [12]. It is advisable to correct these conditions by means of physical therapy, first of all, by therapeutic exercises aimed at improving the flexibility of muscles, spine and hip, increasing their strength, improving proprioceptive control, etc.

The result we obtained demonstrated a higher efficiency of the developed physical therapy program and a statistically significantly better result in terms of the effect on HSS indicators in the MG compared to the CG in all studied parameters. Such an effect can be justified by an individual approach taking into account geriatric features, reducing the severity of sarcopenia, which facilitates the performance of motor functions and general well-being [4; 5; 9].

Therapeutic exercises are an important component of therapy for OA, sarcopenia and movement disorders in general. A decrease in physical activity is directly related to a decrease in work capacity and an increase in the frequency of premature death. Therefore, for this contingent of patients, it was useful to use exercises within the framework of the physical therapy program created by us, aimed at increasing strength and developing other physical qualities. Based on data from the literature [6; 15] and

our own experience, we believe that when comorbid pathology associated with impaired motor functions is detected in the elderly, it is necessary to create optimal conditions for maintaining their autonomy and quality of life by improving the motor component. The main principle of rehabilitation of geriatric pathology is the adequacy of the workload, broad focus and long-term; restorative intervention should include comprehensive support of muscle tissue (kinesitherapy, diet, intake of certain micronutrients), which echoes the works of other authors [2; 5; 9].

Conclusions.

1. In elderly patients with hip osteoarthritis and sarcopenic obesity, signs of hip-spine syndrome in the form of pain syndrome in the hip and lower back, limitation of their mobility (according to the results of questioning, examination, palpation), reduced flexibility of the spine (according to the tests of Schober, Thomayer, Sedyna), deterioration of the strength of trunk extensor muscles (according to static dynamometry), which negatively affected the performance of activities of daily life (according to the Oswestry Disability Index).

2. The tested comprehensive program of physical therapy with the use of therapeutic exercises of various directions, functional training, proprioceptive neuromuscular facilitation, massage, kinesiological taping, shock wave therapy, nutritional correction, patient education with consideration of individual rehabilitation goals revealed a statistically significant improvement in the condition of patients through influence on components of hip-spine syndrome due to reduction of pain and improvement of mobility of hip and hip joints, improvement of flexibility of the spine, increase of standing strength, expansion of motor functional capabilities when performing various activities in comparison with the initial indicators for all studied parameters ($p<0.05$).

3. Elderly patients with osteoarthritis of the hip and sarcopenic obesity, who underwent rehabilitation according to a standard program for the correction of osteoarthritis, achieved a statistically significant improvement compared to the initial state according to the investigated indicators of hip-spine syndrome ($p<0.05$), but less pronounced compared to the tested created by the program. from the standpoint of correction of comorbidity features and geriatric status.

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