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Комплексная реабилитация детей и подростков при дисфункции крестцово-подвздошных суставов

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АННОТАЦИЯ

Обоснование. С болью в спине встречаются врачи многих специальностей. Одна из наиболее частых причин неспецифической боли в спине (НБС) — это дисфункция крестцово-подвздошных суставов (КПС). Существуют общепринятые подходы лечения данной патологии, включая медикаментозную коррекцию, физиотерапевтическое лечение, лечебные блокады и мануальную терапию (МТ). В большинстве случаев данные методы и МТ помогают уменьшить выраженность болевого синдрома с восстановлением физиологической подвижности КПС. Однако есть категория пациентов, у которых, несмотря на проводимую терапию, сохраняется боль в спине. Наиболее вероятные причины неэффективности МТ — это нарушение мышечного баланса, поддерживающее суставные дисфункции. Коррекция данного типа нарушений проводится с помощью других реабилитационных методик.

Цель исследования — разработать комплексную программу реабилитации пациентов с НБС, возникшей на фоне дисфункции КПС.

Материалы и методы. В проспективном исследовании участвовали 54 пациента в возрасте от 7 до 18 лет с жалобами на боль в пояснично-крестцовом отделе позвоночника. Пациентов разделили на две группы: в первой осуществляли мануальную коррекцию дисфункции с последующей механотерапией на блоковых тренажёрах, во второй коррекцию суставной дисфункции выполняли с помощью специально подобранных движений, проводимых асимметрично в зависимости от выявленных нарушений, а программа лечебной гимнастики включала механотерапию и постуральные тренировки. На всех этапах реабилитационного лечения по системе прогрессии проводили обучение мышечному контролю. По показаниям всем детям осуществляли мягкие техники МТ.

Результаты. Разработана поэтапная система оценки биомеханики движений и тонико-фазического баланса. Создана методика реабилитационного лечения НБС с сопутствующей дисфункцией КПС, подбираемая индивидуально в зависимости от выявленных нарушений и особенностей двигательной активности.

Заключение. Предлагаемая система реабилитации упрощает и систематизирует работу с группой детей и подростков, предъявляющих жалобы на боли в спине при наличии костно-суставной дисфункции. Повышается эффективность реабилитации за счёт точно подобранных методик в зависимости от первопричины НБС на фоне остро возникшей или рецидивирующей дисфункции КПС. Методика реабилитации, направленная на профилактику повторных дисфункций КПС, помогает предотвратить рецидивы боли в спине и минимизировать риск развития суставной патологии нижних конечностей.

Ключевые слова: боль в спине у детей и подростков; дисфункция крестцово-подвздошного сочленения (КПС); синдром подвздошно-поясничной мышцы; синдром квадратной мышцы поясницы; цервикальный уровень нарушений, приводящий к боли в нижней части спины; реабилитация при боли в спине; мягкие техники мануальной терапии при дисфункции КПС.

Как цитировать

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Complex rehabilitation of children and adolescents with dysfunction of the sacroiliac joints

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ABSTRACT

BACKGROUND: Back pain (BP) is encountered by physicians in many specialties. Sacroiliac joint (SIJ) dysfunction is one of the most common causes of non-specific BP (NBP). Many approaches have been accepted for the treatment of this pathology, including drug correction, physiotherapy, therapeutic blockade, and manual therapy (MT). In most cases, these methods help reduce the severity of the pain syndrome and restore the physiological mobility of the SIJ. Despite ongoing therapy, BP persists in some cases. The most likely reason for the ineffectiveness of MT is impaired muscle balance. The correction of this impairment is carried out with the help of other rehabilitation techniques.

AIM: To develop a comprehensive program for the rehabilitation of patients with NBP associated with SIJ dysfunction.

MATERIALS AND METHODS: A prospective study included 54 patients aged 7–18 years who complained of pain in the lumbosacral spine. The patients were divided into two groups: the first group underwent manual correction of dysfunction, followed by mechanotherapy on block simulators, and the second group underwent correction of articular dysfunction using specially selected movements performed asymmetrically depending on the identified disorders, and the therapeutic gymnastics program included mechanotherapy and postural workout. At all stages of rehabilitation treatment according to the progression system, training for muscle control was carried out. According to indications, all children underwent mild MT.

RESULTS: A dynamic step-by-step system for assessing the biomechanics of movements and tonic–phasic balance has been developed. A technique for the rehabilitation treatment of NBP with concomitant SIJ dysfunction has been developed, which was selected individually depending on the identified disorders and features of motor activity.

CONCLUSION: The proposed rehabilitation system simplifies and systematizes work in patients who complained of BP associated with osteoarticular dysfunction. The effectiveness of rehabilitation increased due to the precisely selected methods, depending on the root cause of NBP associated with acute or recurrent SIJ dysfunction. A rehabilitation technique aimed at preventing recurrent SIJ dysfunctions helps prevent relapses of BP and minimize the risk of developing articular pathology of the lower extremities.

Keywords: back pain in children and adolescents; dysfunction of the sacroiliac joint (SIJ); iliopsoas syndrome; quadratus lumborum syndrome; cervical level disorders leading to low back pain; rehabilitation for back pain; soft manual therapy technique for SIJ dysfunction.

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ECO•VECTOR

BACKGROUND

Back pain occurs in children, adults, professional athletes, and people who never play sports. Its causes can be specific, requiring specialized care, and nonspecific, or musculoskeletal, which predominate in incidence (80%–90%) [1–3]. A cause of nonspecific back pain (NSBP) is dysfunction of the sacroiliac joints (SIJ). According to most studies, the incidence of SIJ dysfunction is 15%–30% [4–8]. However, studies on chronic and recurrent pain in children are few; there are conflicting data on its incidence, ranging from 4% to 88%, depending on the pain location. Complaints of back pain are reported by 14%–24% of children and adolescents, musculoskeletal pain affects 4%–40%, and multiple pain syndrome occurs in 4%–49% of individuals examined [3, 9, 10].

Pain and discomfort in the joints of the iliopsoas region can occur against intra-articular disorders, such as spondyloarthritis, infections, arthritis of various origins, malignant formations, and extra-articular changes, namely, enthesopathies, ligamentous apparatus damage, fractures, and myofascial disorders [4, 2]. Moreover, it is not always possible to establish the specific cause of pain or it takes several years, which requires additional research to improve diagnostics and develop rehabilitation complexes [4]. Despite several studies on clarifying the causes and optimizing treatment, diagnostic and therapeutic difficulties remain. X-ray and neuroimaging diagnostics are crucial for ruling out "red flags" but contribute little to the diagnostics of functional joint pathology [7]. The literature indicates that the main causes of nonspecific pain are impaired muscle tone (myofascial, muscular–tonic, and fibromyalgic syndromes) and joint dysfunction, including impaired mobility of the facet joints and sacroiliac joints [11, 12]. Difficulties in rehabilitation may occur owing to an unclear understanding of the root causes and interrelationships of the dysfunctions.

There are generally accepted approaches for the management of patients with acute NSBP, including drug treatment, such as prescription of nonsteroidal anti-inflammatory drugs, muscle relaxants, and other painkillers and local administration of anesthetics (therapeutic blockades) and/or radiofrequency ablation with possible manual therapy to restore the mobility of the joint [3, 4, 7, 13, 14]. An ambiguous effect is noted during therapeutic blockades in children and adolescents experiencing pain in the SIJ, which is confirmed by positive orthopedic tests. In a study conducted in 2022, 46% of patients reported improvement, but 23% reported a relapse of pain, despite the drug blockade [4]. Diagnostic blocks are the gold standard for diagnostics; however, their results should be interpreted with caution because false-positive and false-negative results can appear.

The leading role is given to nonmedicinal methods of patient management; however, therapeutic exercises, physiotherapeutic treatment, and massage do not have convincing evidence of effectiveness [11–13]. The role of therapeutic exercises should be clarified because most literature sources provide information about the insufficiency of available data. This indicates the need for physical therapists to search for a treatment approach based on personal experience and level of education [7]. Some authors recommend relative rest, home exercises, physical therapy, and nonsteroidal anti-inflammatory drugs for treating patients with muscle tension [3]. Although there is evidence of the efficacy of conservative treatment of low back pain in adults, including exercise and manual therapy, information about the effectiveness of this therapy in children and adolescents remains lacking. Thus, there is an urgent need for more research on the management of NSBP in the nonadult population [13]. To date, there are no comprehensive evidence-based recommendations for treating NSBP in children and adolescents [8]. Thus, a clear algorithm for rehabilitation treatment is warranted.

To increase the efficiency of rehabilitation treatment for low back pain and SIJ pain, the use of a multidisciplinary approach is appropriate. Conservative treatment aims to eliminate underlying causes of dysfunction, such as impaired posture and gait, and involves physical therapy and manipulation [7]. To increase the efficiency of the treatment, when selecting a restorative technique, information is required about the cause of osteoarticular and myofascial disorders. This information can be obtained by following a diagnostic algorithm to identify various levels of imbalance in the myofascial and osteoarticular relationships.

This study aimed to develop a rehabilitation program for patients with nonspecific back pain arising from dysfunction of the sacroiliac joints and a dynamic diagnostic system to evaluate the efficiency of rehabilitation.

MATERIALS AND METHODS

Study design

A prospective randomized study of the efficiency of a generally accepted method of physical therapy, including mechanotherapy on block-type training devices and the proposed postural gymnastics program.

Compliance criteria

Inclusion criteria: Children and adolescents aged 7–18 years with NSBP and/or impaired motor activity, accompanied by pain in the knee and/or ankle joints caused by dysfunction of the sacroiliac joints.

Exclusion criteria: Patients with specific causes of back pain (spinal injuries, compression syndromes (radiculopathies), unstable spondylolisthesis, and other disorders causing secondary back pain).

Conditions and duration of the study

The study was performed at the Smart Recovery Sports Medicine Clinic at the Novogorsk Educational and Training

Center while working with the Russian rhythmic gymnastics team and at the Clinic of Innovative Technologies from February 2019 to September 2022.

Description of medical intervention

The patients were divided into two groups for a course of rehabilitation treatment. All pediatric patients were examined clinically and neurologically with neuroorthopedic and functional testing, including postural assessment on unstable support. Pain intensity was assessed using a verbal analog scale (VAS).

Group 1 received manual therapy to correct SIJ dysfunction. The course of therapeutic exercises included mechanotherapy using block-type training devices and general developmental exercises aimed at increasing muscle strength, flexibility, and coordination of movements.

In group 2, normalization of SIJ mobility was performed using asymmetrical application of scapular and pelvic patterns, similar to PNF therapy and gentle manual therapy techniques, which aim at normalizing muscle tone of the postural muscle group (scalene, serratus anterior, diaphragm, and iliopsoas). Therapeutic gymnastics comprised a course of mechanotherapy, similar to the complex performed in group 1, and additionally developed postural gymnastics using equipment with unstable support (fitballs, balancing pads, TRX loops).

Postural gymnastics included three stages: preparatory, basic, and advanced. Stage 1 (preparatory) was aimed at muscle relaxation of phasic muscles and reflex activation of tonic muscles through relaxation exercises in the unstable support system. Stage 2 (main) included basic exercises on suspension systems or fitballs (depending on the identified training level), activating the body muscles with the involvement of the main muscle bands while maintaining the goals of stage 1, namely, relaxation of phasic muscles and reflex activation of tonic muscles with restoration of the physiological function of the respiratory muscles. Stage 3 (advanced or sports) was aimed at restoring the tonic–phasic balance by increasing the strength and elasticity of the muscular–fascial bands, coordination, stability of the body, and muscle control according to the stopped falling principle when bringing the body to extreme points on the verge of falling with the possibility of holding the body without overstraining the phasic muscles. Training was performed in both horizontal and vertical systems with the inclusion of mechanotherapy elements to restore the elasticity and strength of the posterior frontal band muscles. Additionally, the respiratory muscles were activated. In working with patients with recurrent SIJ dysfunction, exercises from the postural gymnastics complex were used in a gentle manner because of the risk of pain recurrence due to repeated displacement of the SIJ. Easier exercises were gradually shifted to more complex tasks that involved holding the body on an unstable support.

Ethical considerations

This study was approved by the local ethics committee of the Research Institute of Emergency Pediatric Surgery and Traumatology (minutes of meeting no. 5; September 28, 2020).

Statistical analysis

Statistical processing of the results was performed using the IBM SPSS Statistics 20 application package.

RESULTS

Study participants

The study involved 54 patients aged 7–18 years with confirmed SIJ dysfunction without concomitant organic causes of pain in the back or in the joints of the lower extremities. The patients were divided into two equal groups depending on the correction methods used: group 1 (n=27) and group 2 (n=27), identical in age, sex, and body mass index. The average age was 14.60±3.32 years. Girls predominated in both groups (12 boys, 42 girls). The body mass index ranged from 17.6 among professional female athletes involved in rhythmic gymnastics to 24.8 among children not involved in sports. The distribution of patients was based on the sequencing of visits. Initially, group 1 was formed, and after enrollment was completed, patients were assigned to group 2. The number of children involved in sports prevailed (38 people), evenly distributed across both groups.

More than 70% of the children were diagnosed with recurrent or chronic back pain, and most of these children were involved in sports with asymmetric twisting movements. Pain characteristics were consistent with mechanical back pain (Table 1).

Main research results

The diagnostic study revealed the main types of osteoarticular disorders, including the local level with SIJ monodysfunction, regional level with concomitant disorders of the muscle tone of the zones closest to the joint zone, and remote level with changes at the cervical level or with an impairment of the tonic–phasic balance. Muscular–tonic syndrome was detected at different levels and varied in severity (Table 2).

Most children showed asymmetric development of muscle bands, most often due to a decrease in the activity of the latissimus muscle on one side and the gluteus maximus muscle on the homolateral side. Further, an impairment of the tonic–phasic balance due to a decrease in the functional activity of the tonic muscles and an increase in muscle tone with a decrease in muscle strength of the phasic muscle group was observed. All children with pain in the lumbosacral spine and SIJ dysfunction had functional weakness of the gluteal muscles, which was often compensated by excessive tension in the ischiocrural and paravertebral muscles.

Table 1. Intensity and characteristics of the pain syndrome

Study parameter	Group 1 (*n*=27)	Group 2 (*n*=27)
Pain intensity according to the VAS	60.63±23.6	71.33±16.2
Acute pain syndrome, n/%:		
• acute	8/29	7/26
• chronic (>3 months)	19/70	20/74
McGill pain characteristics:		
• aching	8/29	7/26
• shooting	12/44	15/55
• stabbing	10/37	9/33
• feeling of heaviness	3/11	5/18
• feeling of tension	23/85	21/77
• cramps	5/18	7/25

Note: Some children indicated several characteristics of pain.

Table 2. Characteristics of the muscular-tonic syndrome, *n*/%

Increased muscle tone	Group 1 (*n*=27)	Group 2 (*n*=27)
Iliopsoas, lumbar quadrate muscles, paravertebral muscles, tensor fasciae	15/55	14/51
Diaphragm	20/74	21/77
Scalenes, serratus anterior, levator scapulae, teres minor, pectoralis major and minor	8/29	7/25
Gluteus maximus and/or medius muscles	27/100	27/100

Note: The table shows muscle groups, since with an increase in muscle tone of one of them (the key one), there was a concomitant increase in the tone of other muscles of this group.

Table 3. Dynamic changes in musculo-articular disorders during rehabilitation

Parameters	Group 1 (*n*=27)	Group 2 (*n*=27)
Dysfunction of the sacroiliac joints	Partial restoration of mobility; relapses in some cases (25%). Insufficient effectiveness of self-manipulation without the help of a chiropractor	Restoration of mobility in all patients. Possibility of training in self-diagnosis and self-correction due to the ease of performing pelvic patterns
Muscle bands	Increase in the elasticity and strength of muscle bands	Increase in the elasticity and strength of muscle bands
Tonic muscles	Without significant dynamics due to the lack of exercises performed with unstable support	Activation of deep muscles during the course of postural gymnastics
Tonic–phasic balance	Increased activity of phasic muscles without significant changes in tonic muscles	Restoring balance by relaxing phasic muscles and activating tonic muscles

Considering obtained data on muscle imbalance, a comprehensive rehabilitation program has been developed, which aimed at restoring muscle–articular dysfunctions. Before starting treatment, SIJ mobility was restored. Subsequently, all patients underwent a mechanotherapy program aimed at restoring elasticity and developing the strength of muscle bands. Additionally, a complex of postural gymnastics was developed and used in one of the groups. If necessary, gentle manual therapy techniques were used to normalize the muscle tone of key postural muscles (scalenes, serratus anterior, diaphragm, iliopsoas muscles).

Table 3 presents the results obtained in both groups against the complex rehabilitation treatment.

In both groups, SIJ mobility and stability were assessed, including dynamics during the implementation of the rehabilitation program. In group 1, when performing manual

Fig. 1. Self-diagnosis to identify the side of sacroiliac joint dysfunction.

therapy, which included Kubis manipulations, restoration of physiological mobility was achieved in 86% of patients. In some patients, changes in mobility persisted, such as unilateral hypokinesia and excessive mobility or symmetrical disorders on both sides. When conducting exercise therapy in this group of patients, considering the persisting SIJ dysfunction, twisting movements were excluded to avoid increased pain. Due to the complexity of learning and the lack of effectiveness in performing independent manipulations aimed at restoring SIJ functional activity, self-correction was insufficient.

In group 2, to restore SIJ mobility, we used a developed method of therapeutic exercises using patterns of the scapula and pelvis, similar to PNF therapy, aimed at restoring osteoarticular mobility by activating the diagonal lowering of the pelvis and normalizing the muscle tone of the quadratus muscles during asymmetric combined work with the scapula and pelvis to activate the hypotonic side and relax the part with increasing muscle tone. In this group, restoration of SIJ mobility was registered in 94% of cases. In the remaining 6% of patients, mobility restoration was achieved by restoring muscle tone at the cervical level using gentle manual therapy.

In restoring physiological mobility in group 2, a sequential correction algorithm was used, namely, restoration due to pelvic patterns (posterior or anterior descent of the pelvis on the affected side). In case of inefficiency, we proceeded to the next level with asymmetrical work aimed at increasing the quadratus lumborum muscle elasticity on the side of spasm (asymmetric patterns of the scapula and pelvis) and contraction of the contralateral muscle due to the anterior or posterior version of lowering the scapula and raising the pelvis. If dysfunction persisted, gentle manual therapy was performed to relax the iliopsoas muscle with control of lumbar hyperlordosis. If correction was required at a higher level, the muscles at the thoracolumbar and cervical levels were relaxed until a visual effect was achieved, namely, hyperlordosis regression.

As a result, the mobility of this joint was restored in all patients. Given the simplicity of corrective pelvic movement, all patients were taught the method of self-diagnostics (Fig. 1) aimed at identifying the affected side and self-correction (Fig. 2).

During rehabilitation treatment in both groups, the instability of the result was revealed against habitual static overload with a sedentary lifestyle and an asymmetric load of children and adolescents involved in sports. Considering that there are no intrinsic muscles that move the SIJ, a program was selected aimed at restoring the functional activity of the diagonal muscle bands, which include the latissimus and gluteus maximus muscles for natural fixation of these joints according to the “girdle belt” principle.

During the entire course of rehabilitation treatment, a dynamic was examined to assess the SIJ condition. If complaints characteristic of SIJ dysfunction occurred, neuroorthopedic tests were performed. Important criteria allowing for quick screening of the course efficiency were visual signs of decreased gluteal muscle tone and insufficiency of muscle bands, namely, asymmetrical flexion of the hip in a sitting position (Fig. 3), raising a straight and bent leg from a prone position (Fig. 4), and deviation of the foot in a lying and standing position in a relaxed state.

Fig. 2. Self-correction by lowering the pelvis in a standing position on all fours.

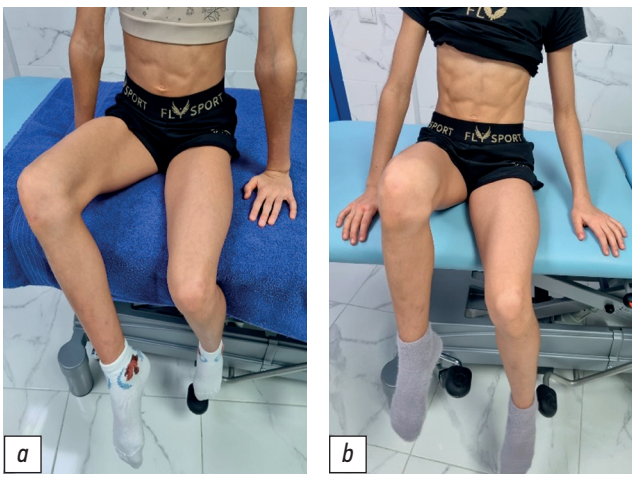

Fig. 3. Lateroflexion of the thigh with functional insufficiency of the gluteal muscles before (*a*) and after (*b*) rehabilitation.

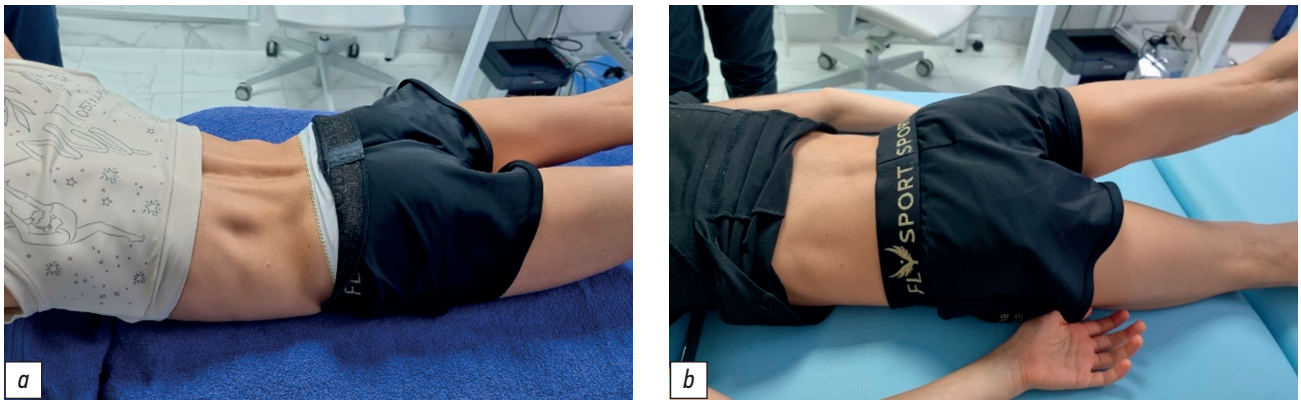

Fig. 4. Increased muscle tone of the paravertebral muscles with insufficiency of the gluteal muscles (*a*) and ischiocrural muscles (*b*).

At the lumbar and cervical levels of disturbances, attention was paid to hyperlordosis in the supine position in the neck and lumbar region (Figs. 5 and 6). These changes were corrected using gentle manual therapy.

These visual stigmas increased the speed and efficiency of dynamic screening during the rehabilitation course.

In both groups, exercises from the mechanotherapy complex were performed to increase the elasticity and strength of the paravertebral and ischiocrural muscles. In group 2, postural gymnastics exercises were added, including exercises aimed at activating tonic muscles with subsequent strengthening of muscle bands, including diagonal ones. The training was performed on a suspension system or using fitballs; it started with general relaxation exercises, and then more complex exercises aimed not only at activating the deep muscles but also at teaching the coordinated work of all muscle bands were gradually introduced (Fig. 7). In cases of severe muscular–tonic

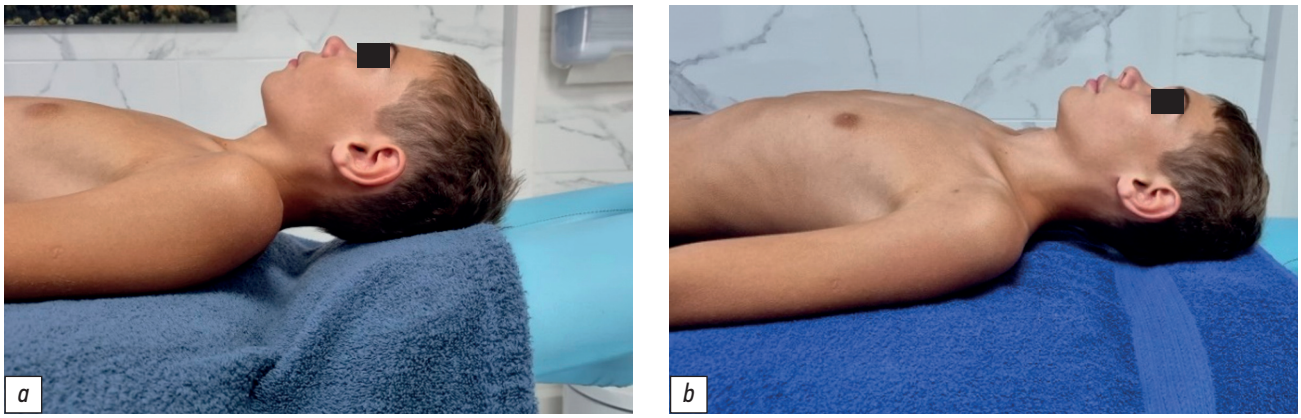

Fig. 5. Cervical lordosis before (*a*) and after (*b*) a course of rehabilitation.

Fig. 6. Cervical lordosis in the supine position before (*a*) and after (*b*) treatment.

Fig. 7. Fitball exercises at the level of sportsmanship.

syndrome of key postural muscles, muscle tone was normalized using gentle manual therapy.

Analysis of the results revealed an improvement in the elasticity and strength of the muscles of the posterior superficial band in children and adolescents of both groups (Fig. 8). Owing to the risk of recurrence of SIJ dysfunction, twisting and asymmetrical exercises were introduced with caution. If repeated impairments of osteoarticular mobility occurred, they were corrected during rehabilitation.

No significant changes were observed in the tonic–phasic balance in group 1. Although the phasic muscles became more elastic and the severity of the muscular–tonic syndrome decreased, the activity of the tonic muscles remained virtually unchanged. In group 2, because of the inclusion of postural training in the program, stability on an unstable support increased, while the tonic muscles were activated, the tension of the phasic muscles decreased, which led to an improvement in the tonic–phasic balance.

These data were obtained during postural testing (holding a fitball with support from various parts of the body). In group 2, after a course of postural gymnastics on an unstable support, activation of the tonic muscles was confirmed with a secondary decrease in pain intensity and decrease in the muscular–tonic syndrome of the superficial muscles (Table 4).

DISCUSSION

Summary of the main research result

Using data obtained during the study, a rehabilitation complex that can be used to gently restore the physiological mobility of the SIJ, normalize the function of muscle bands with the formation of a natural muscle girdle, prevent

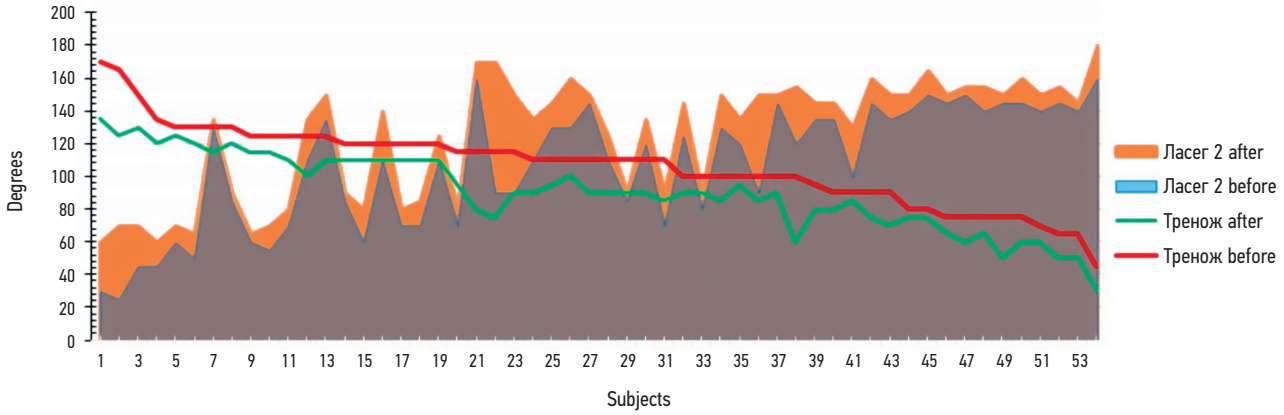

Fig. 8. Dynamics of muscular-tonic disorders before and after rehabilitation.
Note: Ласег, analogue of Lasegue's symptom. Ласег 2, the smallest value when detecting the difference of sides. Тренож, tripod sign, measured in a seated position with outstretched legs.

Table 4. Muscle syndrome index of the tested postural muscles before and after rehabilitation

Dynamics of the muscle syndrome index	Group 1		Group 2	
	before	after	before	after
Scalene muscles	9.85±2.76	5.68±1.59	9.96±3.12	4.35±1.92
Diaphragm	9.89±2.69	9.50±2.59	9.76±3.06	7.15±3.28
Iliopsoas muscles	11.23±3.14	8.48±2.37	11.26±3.52	6.50±2.87

relapses of joint dysfunctions, and improve the tonic–phasic balance was created.

Discussion of the main research result

When comparing several methods for correcting joint dysfunctions, data were obtained on the insufficient efficiency of manual therapy during joint manipulations similar to the Kubis maneuver. This can be due to a significant increase in muscle tone of the muscles potentiating instability of the SIJ. With repeated application of kinesiological techniques aimed at restoring pelvic mobility, a double effect appears with the restoration of the physiological position of the articular surfaces and normalization of muscle tone. If the same type of pelvic descent (anterior or posterior, similar to PNF therapy patterns) is insufficiently effective, additional techniques aimed at normalizing the tone of the quadratus lumbar muscles can be used, thereby reducing the level of muscle tension and increasing the freedom of movement of the SIJ. If SIJ dysfunction persisted, normalization of the tone of the iliopsoas muscles was required using gentle manual therapy techniques. Less frequently, cervical disorders were detected, which were corrected when muscle tone was restored in a distant region.

To consolidate the effect obtained, restoring the elasticity of the muscle bands was critical, which was achieved through a course of mechanotherapy on block-type training devices. An additional postural training program normalized the tonic–phasic balance and increased stability and muscle control. Owing to the simplicity of the exercises, it became possible to conduct testing independently and self-mobilization for SIJ dysfunction and perform a gymnastic complex after learning the exercise technique.

Common causes of impaired mobility of the sacroiliac joint are twisting movements of the torso or high-amplitude steps. When conducting a comprehensive rehabilitation program, the risk of SIJ dysfunction during twisting movements was considered; therefore, at the initial stage of treatment, these exercises were excluded from the program and were not recommended for performance in everyday life when performing sports or in the habitual asymmetrical position of the body during games and training.

CONCLUSION

Sacroiliac joint dysfunction is not always the cause of back pain; in many cases, it is an indicator of existing muscle imbalances. Therefore, simple manipulations aimed at restoring osteoarticular mobility may be ineffective. Thus, a comprehensive diagnostic examination with tests to identify postural disorders in remote regions, with additional postural testing on an unstable support, should be performed.

Despite the well-established opinion of many neurologists that physical exercises should be prescribed after pain has been reduced during drug treatment, for this pathology, movement therapy without pharmacological support is possible because of manual correction of mobility impairments.

Exercises aimed at restoring the tonic–phasic balance (increasing the elasticity of spasmodic phasic muscles, activating hypotonic muscles while restoring the postural activity of deep muscles, muscle bands and respiratory muscles) must be included in a complex of physical therapy. When performing a rehabilitation program, it is required to observe a pain-free regime using the principle of stepwise progression, when, starting from the least complex level, more complex exercises are gradually introduced, reaching a sports level with complex coordination movements. Thanks to the data obtained regarding the possibility of independent testing and mobilization without the assistance of specialists, it becomes possible to increase the treatment efficiency by independent implementation of a selected rehabilitation program with additional supervision of a coach or parents.

ADDITIONAL INFORMATION

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