MYOFASCIAL NECK PAIN SYNDROME IN WRESTLING ATHLETES:
PREVENTION AND RECOVERY
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Summary
Early sports specialization, increased professional load, technical complexity of motor elements, lack of adequate means of rehabilitation in the training process have become the main triggers in the emergence of MNPS. The aim of the study was to study the mechanisms of development, clinical manifestations and development of the etiological system of treatment of cervical myofascial pain in the absence of actual organic pathology of the spine. Promising treatment is the use of reflexology. Effects of reflexology: analgesia, psychiatric (depression, sedation), nutrition, recovery, muscle relaxation. Conclusions: Athletes are mainly characterized by pain in the muscles that provide static work, as well as different options for the distribution of MNPS, depending on the sport. The upper and lower extremities are involved in performing active motor functions characteristic of sports. In general, local symptoms of pain were observed in 52.5% of athletes, and common – in 40.6%. At the same time, MNPS was most common in 63.4% of cases of cervical wrestlers and 58.4% of cases of lumbosacral region; in athletes, the development of myofascial disorders increases the bioelectrical activity of muscles at rest; Athletes with common symptoms have reduced control processes in the central nervous system [1]. It is characterized by an increase in multisynaptic reflex excitability at the level of the brain stem; emotional disorders in athletes in the presence of myofascial pain are characteristic in the presence of the third stage of the pathological process; the occurrence of general symptoms of MNPS according to the study leads to an increase in the average time of sensorimotor response, deterioration of motor processes and increased fatigue when performing a series of tests; MNPS treatment, which includes reflexology and PIR programs based on clinical and instrumental studies, significantly improves the athlete’s condition during 12 months of follow-up.

Key words: myofascial pain syndrome, trigger points, muscles, tone, reflexology

Myofascial pain syndrome (MNPS) is the most common pathological condition of the musculoskeletal system. Among the population, the prevalence of myofascial pain is 12%, and among those who seek medical help, up to 30%. MNPS has the following characteristic symptoms: the first is an increase in muscle tone, the second is the development of painful muscle seals, so-called myofascial trigger points, and the third is dysfunction, manifested by decreased strength, elasticity, speed and accuracy of muscles. If we compare the groups of patients with different levels of physical activity, in patients with minimal physical activity 49% of patients with MNPS, and in those who do sports and choreography – 82%.

Myofascial pain is one of the most common but understudied pathological conditions. Financial losses in the presence of myofascial pain syndrome are associated with its widespread prevalence and severity of clinical symptoms, leading to long-term disability and serious conditions not only medically but also socially. Wrestlers most often have neck pain due to specific grips in sparring.

Patients with myofascial pain are treated by various specialists. Therefore, currently not fully developed a comprehensive approach to the diagnosis of myofascial pain as a one-stage pathological process with the assessment of motor stereotypes, autonomic reactions, psychological and emotional disorders, pain symptoms [2,4].

The most serious manifestation of this disease is systemic fibromyalgia syndrome. This stage of the disease has been studied quite carefully. At the same time, the early clinical manifestations of myofascial pain syndrome, as well as some disorders of nervous activity have not been fully studied. In many cases in the early period there are no aggressive manifestations of the disease. As a result,
due to untimely treatment, many athletes have inadequate motor stereotypes, limited movement in different planes and areas of the body, as well as suboptimal statics and dynamics, which occur in parallel with various muscular disorders of the face and neck in the early stages. They are manifested in a severe pathological process.

The causal relationship between the occurrence of muscle hypertonia (MH) and functional blockade of the spinal motor segment (CPS) and degenerative-dystrophic changes of the cervical spine has not been fully studied.

Correction of pathologically altered motor stereotypes is very important in the complex treatment of myalgia syndrome. However, there are no studies on the use of computer-analog digital techniques in the system of objective assessment of motor stereotyped disorders of the cervical MNPS.

The most important symptom of cervical pain is segmental and suprafacial autonomic neuropathy, which exacerbates the disease. In the modern literature no comprehensive explanation of vegetative homeostasis has been found in patients with MNPS of the cervical spine.

In recent years, there have been many publications on the drug therapy of clinical manifestations of MNPS. In addition to medical approaches to the treatment of functional disorders of the nervous system in various diseases, there are also methods of active biological control and rehabilitation of such patients. Treatment of myofascial pain currently involves correcting one or two of the most important symptoms of the disease. Most often it is painful, which is one of the main symptoms of MNPS. However, its therapy often does not take into account the type of autonomic response, the functional state of the motor system, the psychological characteristics of the patient’s personality, there is no comprehensive approach to the treatment of MNPS.

The aim of this study was to study the mechanisms of development, clinical manifestations and development of the etiological system of treatment of cervical myofascial pain in the absence of actual organic pathology of the spine.

According to the purpose the following tasks of research have been defined.

1. To study the etiology and stage of cervical myofascial pain.
2. To study violations of motor stereotypes and determine their etiological significance in the formation of cervical myofascial pain.
3. Describe autonomic and psychoemotional disorders depending on the stage of cervical myofascial pain syndrome and determine their pathogenic role.
4. To develop a system of treatment and prevention of cervical localized myofascial pain syndrome, taking into account the peculiarities of clinical symptoms and pathogenic mechanism of the disease.

The study used instrumental methods, statistical analysis of data, as well as modern theoretical studies to obtain reliable evidence. The work was conducted as a comparative randomized open-label study using parallel groups of athletes (18-22 years) of different weight categories and physical training.

RESULTS OF THE RESEARCH

Early sports specialization, increased professional load, technical complexity of motor elements, lack of adequate means of rehabilitation in the training process have become the main triggers in the emergence of MNPS. Most athletes develop various changes in the musculoskeletal system during adolescence, including sore muscles. Seals lead to the development of MNPS. In the etiology of MNPS the main role belongs to the residual muscle tone after work, the scale of which depends not only on the nature, intensity and magnitude of the load, but also the individual functional characteristics of different parts of the central nervous system. Emotional support activities. The morpho-functional basis of MNPS is local palpation of trigger points, which is characterized by local and radiating pain, local pain on palpation, during sports, decreased muscle elasticity, speed and intensity of training exercises, impaired coordination. This inevitably leads to a deterioration in sports performance. Neurophysiological methods can be used to study IFACs to objectively characterize the mechanisms of their development and progression. At the same time in sports medicine the complex system of diagnostics of patients with MNPS with application of clinical, electrophysiological, psychological and psychological methods is created [3].

Thus, the etiology of MNPS in athletes is different. In this regard, it is essential to distinguish between the treatment methods to be used. As the development of myofascial disorders reduces the athlete’s physical function, including physical training, and significantly increases the risk of locomotor injury in athletes, rapid and effective correction of myofascial disorders creates conditions for increased sports results and maintains proper health in the team. Correction of MNPS in athletes can not be limited to local effects that normalize muscle nutrition, but should be aimed at systemic mechanisms of pathological processes, including different levels of CNS dysfunction. In this context, it is advisable to use reflexology (RT) and postisometric relaxation (PIR).

Treatment of myofascial pain syndrome (MNPS) should be one of the main elements of comprehensive treatment of pathology of the musculoskeletal system of the athlete.

The stage and severity of the pathological process should be taken into account. For mild severity, a set
of topical treatments is sufficient to correct muscle changes and partially regulate motor activity. These include muscle relaxation, massage, hypertensive relaxation (manual therapy, physiotherapy, etc.). At moderate severity, myofascial puncture, laser reflexology, novocaine infiltration, or other anesthetics are effective in a previous medical facility. Treatment should include exercises to restore impaired motor stereotypes achieved by sensorimotor activation. Concomitant psycho-emotional and autonomic disorders can be alleviated by reflexology, psychotherapy, water treatment, and in case of insufficient effectiveness of the latter, psychopharmaceutical therapy is prescribed [4].

Surveyed athletes (49 respondents, aged 18-21) rarely complained of pain. In most of them, only lively questions revealed the presence of pain in certain parts of the musculoskeletal system. It should be emphasized that athletes (according to their own 46 reviews) often do not consider even severe pain in the muscles, spine or joints to be abnormal. The feeling of pain is an integral part of the training process for many. This is especially true of high-speed sports, athletes who develop endurance, representatives of various martial arts. On the contrary, non-athletes are usually active in reporting minor pain. Thus, in the survey of the group of athletes only 9.9%, while 48.3% of people in the group of non-athletes actively complained of pain. This trend was most pronounced among women athletes and non-athletes (15.2% and 66.7% of cases, respectively). In most cases, targeted studies have shown that athletes and non-athletes complain of moderate or moderate pain intensity with contractile work of the muscles of the neck (34.7% and 51.7%, respectively), back (44, 6% and 41.4%), waist (54.5% and 37.9%).

Wrestling (Greco-Roman, freestyle, judo, sambo) is an acyclic sport that requires the development of quality and coordination of speed and strength. Different types of motor stereotypes involve the difficult coordination of most muscle groups. Special conditions for these sports are the pathogenic effect of throws on the musculoskeletal system, which sooner or later leads to damage to the spine, especially the neck. Weights, including barbells, are widely used in the training process. The distribution of MNPS in representatives of different types of struggle is similar and includes mainly cervical, dorsal and lumbosacral variants. All wrestlers had signs of vertebral syndrome at the cervical, thoracic and (or) lumbar levels, which largely determined the peculiarities of the distribution of MNPS in representatives of this sport.

Intensive sports contribute to the development of MNPS. This is facilitated by both the high load on the muscular system and the inadequate use of rehabilitation aids in modern educational and training processes. The development of myofascial disorders, even in asymptomatic course, negatively affects the functional fitness and well-being of the athlete. MNPS is also an important risk factor for sports injuries. Therefore, its timely modification contributes to the growth of sports results, maintaining the health of athletes, the duration of the sport. Treatment of MNPS is a complex challenge, and there is still no satisfactory solution in terms of the direct benefits of treatment or in terms of ensuring the sustainability of long-term outcomes [6].

When choosing a treatment program, there is often an underestimation of the mixed genesis of MNPS, namely the combination of lack of antinociceptive control, inhibition of CNS, dysfunction of psychophysiological and autonomic spheres, and pathological afferents from cells in the musculoskeletal system. Treatment taking into account the leading mechanisms of the pathological process. In a wide range of treatment methods MNPS special place is occupied by methods of acupuncture therapy (reflexology) of manual therapy, which are characterized by polyvalent therapeutic effect, are economical and safe for long-term use, including in sports. Based on the literature and the results of this study, approaches to the treatment of MNPS in athletes have been developed. They are based on the leading clinical and pathophysiological factors that reflect the mechanisms of MNPS, the severity and features of the pathological process, as well as the need for a wide range of sports doctors in training and competitive activities. Of course, in modern situations, non-drug therapy is preferred, as the use of high doses of very powerful drugs can be more dangerous to the health of athletes than the chronic MNPS itself [5].

Postisometric relaxation: the essence of this technique is a combination of short-term (5-10 seconds) isometric stresses and passive stretching in the next 5-10 seconds. Repeat this combination from 3 to 6 times. As a result, the muscles develop persistent hypotension and the initial pain disappears. The relaxing and analgesic effect of PIR is associated with complex unidirectional changes in the afferent system of the spinal cord segmentation apparatus.

Reflexology is a system of therapeutic effects based on stimulation by various factors of acupuncture points and other receptor zones. Important advantages of the therapeutic effect of RT are its complex nature, a combination of pathogenetic and symptomatic effects. The objectives of the use of RT in MNPS were as follows:

• normalization of the functional state of segmental and suprasegmental structures of the motor system, which control muscle tension;
• elimination of emotional and affective disorders and autonomic dysfunction;
• symptomatic analgesia if necessary

Promising treatment is the use of reflexology – a system of therapeutic effects based on stimulation by mechanical, physical, chemical and biological factors of acupuncture points and other receptor zones. An important advantage of the therapeutic effect of reflexology
is its complex nature, a combination of etiological and symptomatic effects. The RT method has a multimodal therapeutic effect, which is extremely valuable in reducing myofascial pain, which is multifactorial. Effects of reflexology: analgesia, psychiatric (depression, sedation), nutrition, recovery, muscle relaxation [9].

**DISCUSSION OF RESEARCH RESULTS**

Typical variants of MNPS localization in different muscle groups were identified.

Option 1 – cervical. Trigger points can be determined in the following muscles: trapezius, raising the angle of the shoulder blade, sternoclavicular-mastoid, belt, hemispherical.

Option 2 – dorsal. Trigger points can be located at the level of the thoracic spine in the muscles: the lower part of the trapezius, rhomboid, longest back muscle.

Option 3 – upper body. Trigger points can be localized in the muscles of the upper extremities: supraspinatus, subscapularis, deltoid, large and small thoracic, biceps, triceps, brachioradialis.

Cervical myofascial pain syndrome is a typical pathological process characterized by the gradual passage of three stages. At the I and II stages the disease develops mainly as a process of spine formation. Mental and motor dysfunction is of paramount importance in the onset of stage III.

Dependent on the stage of myofascial pain syndrome and the level of localization of changes in functional block or degenerative-dystrophic changes in the cervical spine, symptoms of muscle allostatic and pathological motor stereotypes were localized and generalized.

Stage I of this disease has the following features: the predominance of latent muscle hypertonia over active; local and intraregional type of motor stereotype violation; predominance of temporary myoadaptive reactions and atypical motor patterns. Violation of local and intraregional types of motor stereotypes and the predominance of atypical motor models.

Stage II of the disease has the following features: the same quantitative ratio of latent and active muscle hypertonia; regional and polyregional type of locomotion disorder; formation of regional suboptimal (pathological) stereotype. Presence of clinically established muscular syndromes (lower oblique, small pectoral muscle, middle and anterior oblique muscle, etc.).

Stage III of the disease most often develops in two slow and acute variants. Both options have the following characteristics: overstrain of autonomic balance, centralization and dysfunction of the suprasegmental part of the autonomic nervous system, there is a predominance of reflex sympathetic and tonic reactions in patients with vertebral dysfunction in the upper, middle and lower neck; symptoms of psychological disorders are grouped into outlined clinical syndromes of obsessive-phobic, anxiety-distrustful, anxiety-depressive, hypochondriac, asthenic, cognitive, neurasthenic and dysphoric disorders. Formation of generalized suboptimal (pathological) motor stereotypes [8,10].

Indicators of the functional state of the autonomic nervous system – in patients with MNPS of the cervical region, stage I according to physiological criteria, psychological disorders occur sporadically, reversibly and unstable. Reflex parasympathetic response in patients with spinal dysfunction of the upper cervical spine and sympathetic tone in patients with localized problematic PDS at the lower level of the cervical spine predominate in stage II MNPS of the cervical region. Symptoms of psychological disorders become more pronounced and manifest themselves in conditions of maladaptation of the individual on a neurotic level. In stage III of the disease there is excessive tension of autonomic balance, centralization and dysfunction of hypersegments of the autonomic nervous system, upper, middle and lower neck, symptoms of psychological disorders are obsession, anxiety, sometimes anxiety depression, helplessness. Cognitive, nervous disorders are similar to weakness and discomfort and are classified as outlined clinical syndromes.

A systemic factor in the development of stage I disease is the imbalance of muscles in the segment-area caused by spinal dysfunction. In stage II trigger afferents with positive feedback are myoadaptive responses. The quality of systemic afferentation at this stage acquires a pathological regional and polyregional motor stereotype. In stage III, the quality of system-forming afferents, along with algic manifestations and generalized changes in motor stereotypes, acquire psychological and autonomic disorders [7].

In stage III of the disease there are two forms of clinical course: acute (1 option) and slow progressive (2 option). Option 1 occurs in the context of spinal dysfunction in the middle and lower cervical spine. In the early stages it is characterized by sympathomimetic catatonia with a hypersensitive sympathetic response, after which SI becomes unreactive. Option 2 develops mainly in the localization of vertebral dysfunction at the upper cervical level on the background of parasympathicotonia and depressive psychological symptoms [7].

The system of treatment and prevention measures, developed taking into account the identified characteristics of clinical symptoms and the mechanism of cervical myofascial pain, is effective and can be recommended for wide practical use. The main methods of treatment and prevention should include manual therapy and reduced physical activity.
**CONCLUSIONS**

1. Athletes are mainly characterized by muscle pain that provides static work depending on the sport. The upper and lower extremities are involved in performing active motor functions characteristic of sports. In general, 52.5% of athletes had local symptoms of MNPS, and 40.6% had common symptoms. At the same time, MNPS was most common in 63.4% of cervical wrestlers and 58.4% of lumbosacral cases.

2. In athletes, the development of myofascial disorders increases the bioelectrical activity of muscles at rest.

3. Athletes with common symptoms have reduced control processes in the central nervous system. It is characterized by an increase in multisynaptic reflex excitability at the level of the brainstem.

4. Emotional disorders in athletes in the presence of myofascial pain are characteristic in the presence of the third stage of the pathological process.

5. The occurrence of general symptoms of MNPS according to the study leads to an increase in the average time of sensorimotor response, deterioration of motor processes and increased fatigue when performing a series of tests. Increased excitability of neurons of the sensorimotor system and depression of the central nervous system with psycho-emotional disorders.

6. MNPS treatment, which includes reflexology and PIR programs based on clinical and instrumental studies, significantly improves the athlete’s condition during 12 months of follow-up.

**PROSPECTS FOR FURTHER RESEARCH IN THIS AREA**

The principles of diagnosis and treatment of cervical myofascial pain should be taken into account by neurologists, physiotherapists, chiropractors, orthopedic surgeons, traumatologists, treatment and prevention and sanatoriums in physical therapy, occupational therapy and all manifestations of sports in patients.

Given the role of spinal morphogenetic factors in the early development of MNPS of the cervical region, it is advisable to include manual treatment in the treatment and prevention complex. To reduce physical activity and change behavioral stereotypes, the proposed set of therapeutic exercises should be used in the treatment of patients with cervical myofascial pain.

In the case of cervical myofascial pain syndrome in sanatoriums and medical institutions, it is recommended to use methods of correction of psychological and autonomic disorders on the principle of biological feedback.

**LITERATURE**


REFERENCES


Резюме

МІОФАСЦІАЛЬНИЙ БОЛЬОВИЙ СИНДРОМ ШИЙНОГО ВІДДІЛУ У СПОРТСМЕНІВ-БОРЦІВ: ПРОФІЛАКТИКА ТА ВІДНОВЛЕННЯ

В. І. Горощко

Рання спортивна спеціалізація, підвищене професійне навантаження, технічна складність рухових елементів, відсутність адекватних засобів реабілітації в навчально-тренувальному процесі стали основними пусковими механізмами у виникненні МФБС. Метою дослідження було вивчення механізмів розвитку, клінічних проявів та розробка етіологічної системи лікування шийного міофасціального больового синдрому за відсутності фактичної органічної патології хребта. Перспективним лікуванням є використання рефлексотерапії. Ефекти рефлексотерапії: знеболювання, психіатричні (депресія, седація), живлення, відновлення, розслаблення м’язів. Висновки: в основному для спортсменів характерні болі у м’язах, що забезпечують статичну роботу, а також різні варіанти розподілу МФБС залежно від виду спорту. Верхні та нижні кінцівки беруть участь у виконанні активних рухових функцій, характеристики для спорту. Загалом, місцеві симптоми болей спостерігались у 52,5% спортсменів, а поширені – у 40,6%. У той же час МФБС найчастише зустрічалися у 63,4% випадків шийного відділу у борців і 58,4% випадків попереково-кріжового відділу; у спортсменів розвиток міофасціальних розладів підвищувало біоелектричну активність м’язів у спокійному стані; у спортсменів із поширеною симптоматикою виявлено знижені процеси контрольу в центральній нервовій системі. Характеризується підвищенням мультсинаптичної рефлексотерапії на рівні стовбура мозку; емоційні розлади у спортсменів при наявності міофасціального больового синдрому характерні при наявності третьої стадії розвитку патологічного процесу; виникнення загальних симптомів МФБС за даними дослідження призводить до збільшення середнього часу сенсомоторної реакції, погіршення рухових процесів та підвищення стомлюваності при виконанні серії тестів; лікування МФБС, що включає програми рефлексотерапії та ПІР на основі даних клініко-інструментальних досліджень, значно покращує стан спортсмена протягом 12 місяців спостереження.

Ключові слова: міофасціальний больовий синдром, тригерні точки, м’язи, тонус, рефлексотерапія