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## Functional State Of Muscles In Sports And Physical Training.

Makhov AS, and Medvedev IN\*.

Russian State Social University, st. V. Pika, 4, Moscow, Russia, 129226

### ABSTRACT

Now the method of myofasciography, which very successfully complements the methods used to assess the functional state of skeletal muscles, is becoming more and more active. The method of myofasciography is based on the classical concepts of the segmental nature of muscle innervation and allows the quantitative determination of the functional state of various myotomes innervated by different segments of the spinal cord. This method is most actively used in the course of studies of the effect of adaptive physical training on a person. The results obtained are available for presentation in a convenient visual form, which makes it possible to clearly evaluate the changes that have occurred in the tone of the skeletal musculature under the influence of the applied exercises. The resulting digital measurement data can easily be processed using mathematical statistics. The method of myofasciography finds wide application in the field of sports and physical training of various orientations. This method is considered very promising for obtaining the necessary information during the compilation and adjustment of training programs (taking into account changes in muscle tone), as it allows you to draw a "pattern" of the muscle pattern in any situation.

**Keywords:** myofasciography, diagnostics, musculoskeletal system, muscular pattern, kinesitherapy, paravertebral musculature.

*\*Corresponding author*

## INTRODUCTION

To assess the capabilities of the musculoskeletal system, a number of diagnostic techniques are currently used: myotonometry, electromyography, rheography, stabilometry, etc. Using these techniques, one can get an idea of the electrical activity of the muscles, the amplitude of muscle contraction, the ergonomics of movement, the blood filling of the muscle fibers, the degree of muscle fatigue, etc. [1,2]. The innovative method of myofasciography does not reject the currently used methods, but rather complements them, allows us to judge the general functional state of the skeletal muscles of the musculoskeletal system and its individual muscle groups that are innervated by the segmental [3,4]. The method of myofasciography is based on the classical ideas of the segmental nature of muscle innervation and allows quantitatively (in conventional units) to determine the functional state of various myotomes innervated by different segments of the spinal cord [5-7].

The purpose of the study: to evaluate the effectiveness of myofasciography in assessing changes in the musculoskeletal system that occur during physical training.

### THE POSSIBILITIES OF MYOFASCIOGRAPHY IN EVALUATING THE "MUSCLE PATTERN"

By definition, Doman K. (1988), the pattern (model, image, pattern, pattern) is the temporal and spatial relationship of excitatory and inhibitory processes, manifested in the qualitative and quantitative characteristics of human statics and dynamics. The formation of the muscular pattern in sport is conditioned by the different stages of preparation: the stage of general physical training and the stage of improving athletic skill [8,9]. In the first case - increased attention is paid to the development of physical qualities necessary for this sport (strength, endurance, etc.). The second stage is devoted, in fact, to the formation of the motor skills necessary in this type of sports activities and their further improvement [10]. Undoubtedly, the greatest development is obtained by those muscular groups whose functioning is necessary for performing the movements characteristic for the chosen sport [11]. It has long been known that the development of power capabilities is closely related to the nature of the effort (explosive or smooth) during training [12]. The applied effect on the musculoskeletal system makes it possible to achieve the formation of the desired muscular pattern.

Myofasciogram allows you to assess the nature of the current muscle pattern, characteristic for any sport. The method shows the changes quantitatively (under the influence of various cycles of the training period), which was confirmed earlier [13]. Undoubtedly, such research results are very interesting for the formation of ideas about various muscle patterns that develop due to specific and selective loading. Similar studies are conducted, for example, with regard to athletes of oriental martial arts [14]. In general, while these studies are far from complete and require additional checks and experiments.

### THE BENEFITS OF MYOFASCIOGRAPHY FOR TRAINING SCHEDULES

Observations of the functional state of myotomes innervated by different segments of the spinal cord contribute to making adjustments to the process of improving health (choosing strength exercises to increase and stretch, relaxing exercises to reduce muscle tone innervated by the corresponding segments of the spinal cord).

Of particular interest are observations of paravertebral muscles. Paravertebral muscles, also innervated segmentally (which does not contradict the concept of myofasciographic research), is given the leading role in the treatment and prevention of degenerative-dystrophic processes of the vertebral-motor segments [15, 16].

In order to find the right physical exercises it is necessary to understand the role of paravertebral muscles, its participation in motor acts. Earlier, an uneven distribution of body weight relative to the spine was seen (more than half of the mass is located anterior to the axis of the spinal column). To maintain balance, the body needs to have a muscle group at the back, but the use of muscle tissue to maintain a constant balance is not physiological or economical in terms of energy supply to the body. With this role of the counterweight, balance - the connective tissue: cervical, dorsal and lumbar aponeurosis successfully copes. The role of paravertebral musculature is to correct the balance of body position. Hence the mode of muscular

work is understandable - impulse. Cutting, the muscle adjusts the position of the spine, when the balance is reached - the muscle relaxes. The alternation of periods of work and rest is physiological, the muscle has time to rest and be restored after work. The chain of aponeuroses, constantly participating in the equilibration of the body, is called the "static chain" [17,18]. It is effective and economical, does not consume the energy of muscle contractions, being in constant tension. However, it is possible to include paravertebral muscles in the work of the static chain under the influence of injuries, incorrect working posture, compensatory changes, etc. This leads to the fact that the muscle, when involved in permanent static work, under its influence - atrophies. Adaptation changes: more specialized (muscle) tissue is replaced by less specialized (connective) tissue, as the least energy-intensive for the body [19]. It becomes clear that the method of myofasciography also reflects the state of paravertebral muscles. In this connection, a very important task, solved by the myofasciography, is the selection of various exercises that allow the muscles to "switch off" from the static static work regime and recover [20].

It is recognized that the relaxation of paravertebral muscles occurs due to methodically correct exercise: the muscles of the back are relaxed, elongated and do not participate in the retention of the deflection, the deflection is passively carried out by resting on the elbows [21]. Based on the results of earlier measurements, the paravertebral muscle tone decreased in the C1-CVI, Th1-ThVI regions. It is very important in this regard the selection of static exercises that can correct the tone of the paravertebral muscles.

### CONCLUSION

At present, in the course of studies of the influence of employment in adaptive physical culture on man, the method of myofasciography is increasingly being used. The results obtained are available for presentation in a convenient visual form, which makes it possible to visually assess the changes that have occurred in the tone of the skeletal musculature, under the influence of the applied exercises. The resulting digital measurement data can easily be processed using mathematical statistics. It becomes clear that the method of myofasciography can find wide application in the field of sports and physical culture of any orientation. This method can be successfully applied to the compilation and correction of training programs as a result of drawing up a detailed "pattern" of the muscular pattern in various situations.

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