

NEUROREHABILITATION

CONSCIOUS START OF THE HEAD-NECK REFLEX IN THE RESTORATION OF INDIVIDUAL ANATOMICAL NORM OF BODY POSITION IN SPACE

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Introduction

The level of a human body's functional status depends much on the spectrum of functional status of locomotorium and its neuromuscular apparatus. The operation of locomotorium is considered in this paper.

The analysis of the effect of the author's method for rehabilitation of individual anatomic norm of body position in space was conducted within the framework of the dissertation research, the subject of which was the physiological proof of integrative methods of psychophysical effect on the focus group.

The aim of the study is physiological evidence of the implication of the author's method relating to the development of the locomotorium system through the rehabilitation of the individual anatomical norm of the body position in space (author's). 8 educational institutions of various profiles were subject to examination. A total of 1562 people aged 5 to 27 years were examined.

Research methods of the functional state of the human body in dynamics were based on the application of the author's recovery and development methods of SPPA (system of psycho-physical adaptation) and gymnastics called "Five minutes of health" on its basis which was developed through years of theoretical and practical work on modern choreography and psychosomatic techniques. This is a new author's method, the use of which creates the conditions for conscious start of reflex rehabilitation of individual anatomic norm of body position in spatium. It was assumed that the new method will be available for most people of different age and physical ability. To study the reactions of the body used a variety of modern research methods (stabilometry, podometry, myography, author the "Photo test", spiroarteriokardioritmografii, computer measurement of movements).

Results

Preliminary studies have revealed disorder in locomotorium functioning of the absolute majority of the surveyed, which corresponded to the average values of monitoring of Russian schoolchildren.

In the period between the surveys all the participants in the experimental condition followed the course of rehabilitation and developmental gymnastics "Five minutes of health".

The results of the re-examination showed that in the process of regular classes with strict adherence to the algorithm of actions approximation to the individual anatomical normal position of the body in space, for 3.5 months of training of the author's technique occurred significant positive morphofunctional changes in the group.

They were stated by postural function development, elimination of electrical muscular asymmetry of pair muscles, increase of muscular plasticity and joint mobility, more homogenous distribution of body weight through foot on support area.

Significant changes in locomotorium within the experimental period provoked important changes in the functional state of respiratory, cardiovascular and nervous systems with positive psychoemotional response.

The results of the research and their profound analysis confirmed assumptions of the method efficiency by significantly increasing the adaptive abilities of the human body along with the deliberate start of reflex restoration of the individual anatomic norm of body position in space – this is a "moving concept", but the start originates in the zone of 1-2 cervical vertebrae. During the experimental period a new functional state of the body emerges, when the approach to the individual anatomic norm of body position in spatium turns into an anatomic-physiological norm.

Conclusions

The results of a large number of studies (5610) confirmed that the implementation of the author's method is effective for improving the adaptive abilities of the human body at high psychophysical stress and is of great interest to research new functional state of the body under its influence. The author's method of restoring the individual anatomical norm of the body position in space is an effective way to improve the adaptive capabilities of the body.

INSTRUMENTAL VERIFICATION OF MUSCLE WEAKNESS IDENTIFIED DURING MANUAL MUSCLE TESTING

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Relevency

One of the goals of manual therapy is to restore the nervous system function by means of correcting functional blocks and tone/strength in case of muscle imbalance. The major diagnostic pathology of the nervous system is the evaluation of its activity. In neurology, myotatic reflex is evaluated at rest, and it can be used only for evaluating the nervous impulse conductivity. Yet, clinical manifestations occur under load. In Applied Kinesiology (AK), muscular muscle testing (MMT) is used for that purpose. MMT evaluates how active myotatic reflex is in the process of performing the traumatizing movement. To this day, there are contradictory beliefs as to what MMT diagnoses specifically.

Purpose of the research is instrumental substantiation of functional muscle weakness (FMW) that occurs as a result of performing MMT.

Methods of research are as follows- Biodex Medical Systems, computer tomography, electromyography of the muscles that were diagnosed as having symptoms of functional muscle weakness (FMW) during MMT.

Results

Doing research with the help of Biodex Medical Systems, it was found that strength of the muscle contraction decreases, with FMW ranging from 20 to 35% compared to its initial condition which indicates its actual and not functional weakness.

However, doing electromyography of functionally weak muscles (FWM), no verifiable changes were observed which indicates that conductivity of the nervous impulse to the muscle under study is preserved. Doing computer tomography in standing position, (with gravitational isometric load), muscle stretching was with signs of FMW was registered which suggests its hypotension. Analysis of the sequential involvement of a muscle with the signs of FMW in the movement performed, revealed its delayed activation which suggests its hypoirritation.

Discussion of the results

As is known, muscle contraction has 2 phases, i.e. phasal (arbitrary) and tonic (unconscious). Application of the isometric contraction as a load in MMT, makes it clear that the tonic phase of muscle contraction is being analyzed while MMT is done. The tonic

phase is affected by exteroceptors, proprioceptors, and interoceptors forming visceromotor and other reflexes. Pathological activity of those reflexes causes tone inhibition of a specific group of muscles. Tone inhibition manifests itself in muscle stretching in the static condition, and compensatory static overload of antagonistic muscles, and in the dynamic state, - in its hypoirritability and compensatory pre-emptive involvement of other groups of muscles. This provides a mosaic of the localization of reflex pain syndromes.

Conclusions

1. In MMT, the occurrence of FMW is the result of diagnostics of sensory-motor mechanisms of the tonic component of muscle contraction.
2. Tonic phase is affected by exteroceptors, proprioceptors and interoceptors forming visceromotor and other reflexes.
3. Pathological activity of those reflexes causes inhibition of the tone of a particular group of muscles which is manifested in hypoirritability and hypotension of the muscles tested.
4. Muscular pain reflex syndromes is the result of compensatory overload of other groups of muscles. This provides migration of the localization of pain reflex syndromes.

VISCERO-MOTOR REFLEXES IN CLINICAL PICTURE OF MUSCULAR PAIN SYNDROMES

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Viscero-motor syndromes are described in experimental research with animals. Changes in motor chronaxia during mechanical stimulation of the visceral organs are recorded.

Pathological activity of viscero-motor reflexes causes inhibition of the tone of a particular group of muscles which manifests itself in the static condition in its stretching and compensatory overload of other muscles. And in the state of dynamics, it leads to its hypoirritability and compensatory pre-emptive involvement of other groups of muscles. It makes the clinical picture of pain reflex and compensatory syndromes that is typical for each visceral organ.

Thus, scapulohumeral periarthrosis is typical for liver and stomach pathology, coxofemoral periarthrosis is typical for the reproductive system pathology, cervicalgia is typical for the lung pathology, and lumbodynia is typical for the intestine pathology.

Visual diagnostics makes it possible to quickly identify localization of the hypoirritable and hypotonic muscle that is the result of the pathological activity of viscero-motor reflexes.

THE TECHNOLOGY OF THE REMOTE CONTROL A REHABILITATION PATIENTS AT THE EXOSKELETON

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The practice role of different kind of robotic rehabilitation devices are growing. Now exoskeletons are widely using in rehabilitation at patients with temporary or continuous motor disorder. We studied 9 pilots of exoskeleton during the 3 months. All pilots were patients, which have had SCI with different levels and received rehabilitation course at our clinic. We combined exoskeleton sessions with continuous online registration of cardiointervalography by Bluetooth sensor. The accumulated data were then processed. As a result we concluded that the patients with SCI despite of injury duration need an objective method of control during training and remote cardiointervalography seems as a adequate and suitable method of such control.