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The Effectiveness Of Static Exercises In The Rehabilitation Of Cerebral Palsy.

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ABSTRACT

In recent years, a high prevalence of disability due to the presence of cerebral palsy in humans. Cerebral palsy becomes a very common cause of disability due to vivid clinical manifestations of lesions of the musculoskeletal system, as a result of severe neuromuscular disorders, occurrence of contractures of the joints, degenerative changes of the spinal column, abdominal and back muscles. Many of the children with cerebral palsy who have the ability to move, are engaged in adaptive sports in physical education and sports clubs for the disabled, sections at children's sports schools: athletics, arm sport, weightlifting, and weight lifting. Most of the time of the training process in these children is given to the development of physical qualities that are necessary for success in the chosen sport. Exercise, for example, during exercises related to pushing the nucleus, jerking weights, and running, causes an imbalance in the tone of the paravertebral muscles, contributing to the strengthening of the existing postural disorders. A very important issue in this regard is the need to include in the training process a sufficient number of corrective exercises aimed at normalizing the tone of the back muscles. In a study conducted on persons with cerebral palsy, the recreational possibilities of introducing a set of physical exercises as part of rehabilitation exercises with deflection were evaluated. This modification of physical activity did not provide a pronounced improvement in the performance of myofasciogram, which does not allow us to consider this type of physical activity as effective in the training plan. The data obtained give reason to consider it only as a means of preventing dysfunction in the musculoskeletal system.

Keywords: adaptive physical culture, exercise, static load, myofasciography, tone of the paravertebral muscles.

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INTRODUCTION

In recent years, the high prevalence of disability due to the presence of cerebral palsy in humans [1, 2]. According to statistics, the number of such children is increasing [3]. Such data justify the status of cerebral palsy as the most common type of disability [4], the main clinical manifestation of which is a lesion of the musculoskeletal system [5], as a result of severe neuromuscular disorders [6], the occurrence of joint contracture, degenerative changes in the spinal column detraining the muscles of the abdomen and back [7], leading to posture pathology [8]. Many of the children with cerebral palsy who have the ability to move, are engaged in adaptive sports in physical education and sports clubs for the disabled, sections at children's sports schools: athletics, arm sport, weightlifting, and weight lifting [9, 10]. Most of the time of the training process in such children is given to the development of physical qualities that are necessary for success in the chosen sport [11, 12]. Exercise, for example, during exercises related to pushing the nucleus, jerking weights, and running, causes an imbalance in the tone of the paravertebral muscles, contributing to the strengthening of the existing postural disorders. A very important issue in this regard is the need to include in the training process a sufficient number of corrective exercises aimed at normalizing the tone of the back muscles [13, 14].

Objective: to improve the methodology for the rehabilitation of children with cerebral palsy through the use of static exercises that optimize the tone of the paravertebral muscles.

MATERIALS AND METHODS

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2016 (protocol No. 9). The study involved children diagnosed with cerebral palsy, regularly engaged in adaptive physical culture and adaptive sports on the basis of the Russian State Social University. Of these, randomized control and experimental groups were made, each consisting of 10 people. All surveyed were of secondary school age. The control group was engaged in the traditional for training groups program. Static exercises with elements of passive deflection were added to the program of the experimental group.

Of the 90 minutes of the training session of the control group, the preparatory part was 20 minutes, of which the aerobic workout took 10 minutes and the same time was given to stretching. The main part of the training session (60 minutes) in this group of children was aimed at the development of physical qualities in the type of adaptive sports they master. In the final part of the class, stretching and breathing exercises were performed (10 minutes). In the experimental group, with the consent of parents and children, the lesson time was increased by 30 minutes in order to increase the duration of corrective exercises in the main part (30 minutes) of the lesson.

To influence the thoracic spine, the following exercise was proposed (Figure 1 and Figure 2). Hand-made materials were used: bolster, belt and plastic block ("brick"). The experimental group performed the exercises at the end of the workout for 5-7 minutes. The program of occupations of the control group did not include static exercises with passive deflection. To assess the effectiveness of training sessions, myofasciography was used, which allows determining the tone of the paravertebral muscles. The measurements were carried out before and after training in both groups for 4 months. The study by the method of myofasciography was conducted in the control and experimental groups before and after the implementation of the training program.

The results of the study were processed by the method of mathematical statistics.

Figures 1 and 2. The exercises introduced into the training of the experimental group with deflection.

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RESULTS OF THE RESEARCH AND DISCUSSION

The result of applying the entered exercise achieved during the study is presented on the graph with the most typical myofasciogram (Figure 1).

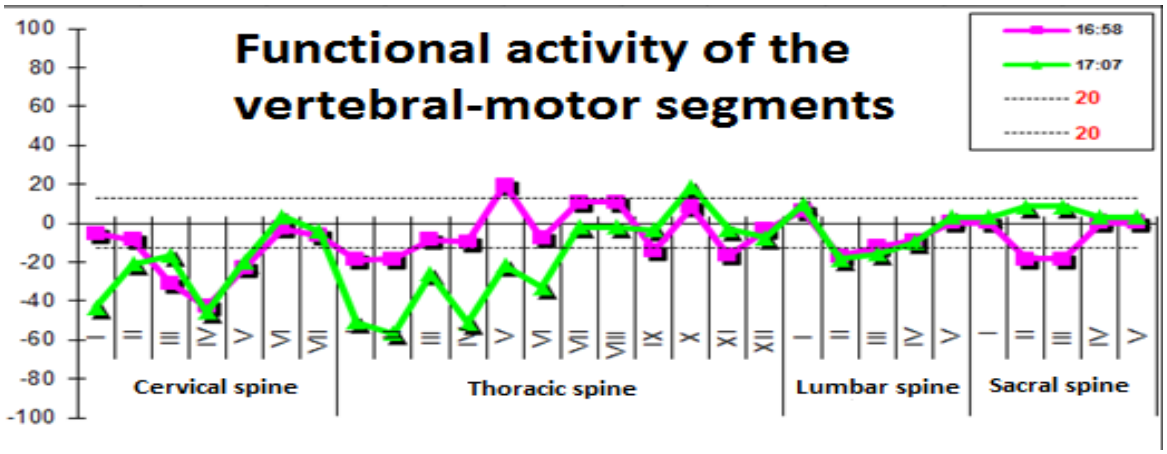

Figure 1. A variant of a typical myofasciogram of the experimental group.

The dark line of the graph is the tone of the paravertebral muscles before the workout, the light line is immediately after the additionally entered exercise. Reduced tone of the paravertebral muscles in the thoracic region.

Below is the most typical graph of myofasciogram taken from a representative of the control group (Figure 2).

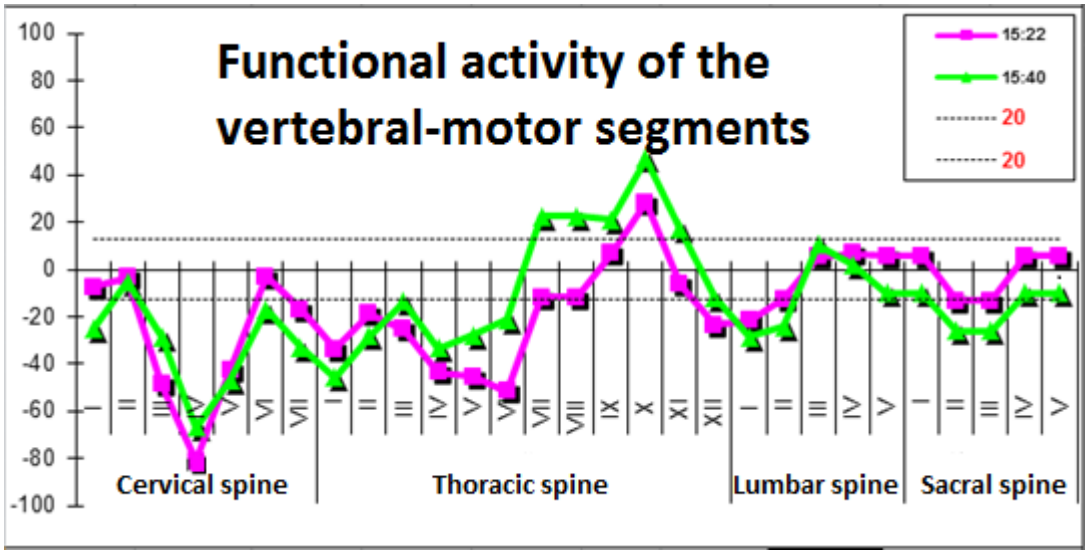

Figure 2. A variant of a typical myofasciogram of the control group.

The dark line of the graph is the tone of the paravertebral muscles before exercise, the light line immediately after. Assessing the two lines, it becomes clear that there is no special, accentuated, point-like, and it is extremely necessary for the recovery of the effect on the tone of the deep back muscles.

It can be said that the static exercises proposed in our study do not affect the achievement of a sports result, they do not train physical qualities (strength, speed, endurance) [15, 16], acting only as a preventive

effect for preventing diseases of the musculoskeletal system [17-21]. Based on the work done, it is still premature to recommend these exercises for inclusion in the complex of classes in adaptive physical culture and adaptive sports as a means of preventing diseases of the musculoskeletal system [22-30]. However, since they require an increase in the extra time of the training session or a reduction in the final part, this has a healing effect, which is apparently due to the activation of muscle activity [31-35].

CONCLUSION

In recent years, the prevalence of disability remains high due to the presence of cerebral palsy in people of different ages. According to statistics, the number of such people is increasing. In a study conducted on persons with cerebral palsy, the recreational possibilities of introducing a set of physical exercises as part of rehabilitation exercises with deflection were evaluated. This modification of physical activity did not provide a pronounced improvement in the performance of myofasciogram. It is not possible to consider this type of exercise as effective in the training plan. The data obtained give reason to consider it only as a means of preventing dysfunction in the musculoskeletal system.

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