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Correction Of Asthenia In Football Players With Down Syndrome.

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ABSTRACT

Complex rehabilitation measures are recognized as an important factor of recovery in various pathological processes. However, their capabilities are not fully appreciated in relation to asthenia, which arose against the background of acute respiratory infection in children with Down syndrome. There is still a need to develop and test the rehabilitation options for children with Down's syndrome who are engaged in football, with the development of asthenia syndrome. It was found that a complex of rehabilitation measures, including a rational diet, therapeutic gymnastics, therapeutic massage and hydrotherapy is very effective in eliminating soccer players 12-13 years old with Down's syndrome and preparing them for regular training. This was shown by comparing the indices of physical endurance, resistance to hypoxia and hemodynamic indicators in soccer players aged 12-13 with Down's syndrome with those of a comparable group of players with Down syndrome, which were restored using a standard technique. The indicators of the players of the 2nd group were lower than those obtained as a result of using the author's technique. The observed group 1 after the end of the rehabilitation period showed not only the restoration of the indicators taken into account, but also an improvement in the subjective assessment of their well-being. The obtained data speak about the advantages of the author's rehabilitation technique in relation to the elimination of asthenia and increase the adaptive capacity of the organism with the chromosomal abnormality to physical loads.

Keywords: Down's syndrome, football, asthenia, rehabilitation, children's age.

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INTRODUCTION

Down's syndrome is a serious complex pathology affecting all body systems [1]. To improve and incorporate into the society in recent years, children with Down's syndrome are trying to engage in regular sports activities [2, 3]. One of the most suitable for children with Down syndrome is football [4, 5]. Regular muscle loads in football sections, including children with Down's syndrome, have a toning, training and stimulating effect on the body [6, 7]. This is due to increased blood flow, intensification of respiratory and anabolic processes throughout the body [8]. As a result, a regular, correctly constructed muscle activity within the framework of football training provides a gradual increase in the level of viability of the organism [9, 10]. This effect allows the use of regular physical training as a healing factor in various pathological processes [11, 12]. At the same time, with the development of acute respiratory infection in children with Down's syndrome, asthenic syndrome may occur, which can sometimes lead to the development of additional organic pathology [13].

If at the stage of the onset of asthenia, a child with Down syndrome provides optimal conditions for the recovery of the organism, then it is possible to effectively interrupt the development of undesirable functional disorders that begin in it and restore physiological processes [14]. Currently, there are many methods of recovery for asthenia [15], but for children with Down syndrome they are not adapted. In this regard, there remains a need to develop and approve options for the rehabilitation of children with Down's syndrome that engage in football, with the development of asthenia syndrome.

The goal is to assess the possibilities of the author's rehabilitation option for asthenia of young football players with Down's syndrome.

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 was conducted on the basis of the Russian State Social University in Moscow, Russia. The study involved 2 groups of children with a mosaic form of Down syndrome 12-13 years old, 3 times a week engaged in a football group. Each group consisted of 10 boys with an asthenic syndrome that began at least 2 weeks ago.

The asthenia syndrome arose in the presence of an acute viral disease. In the first group of children, rehabilitation was carried out according to the author's method. In the second group the traditional scheme of rehabilitation is applied. In both groups, rehabilitation continued for 2 months.

The author's methodology included the following activities. Obligatory was the normalization of the regime of the day and a full 8-hour sleep. For the first group, a diet with a full-fledged diet, rich in vitamins and all the necessary substances was made up. Breakfast of children of the first group consisted of cereals with nuts and fruits, eggs and freshly squeezed juices, as well as muesli, cottage cheese and cheese. Lunch included soups, salads, steam cutlets, and dinner - fish or boiled chicken with garnish (cereals or vegetables). All children of the first group took oxygen cocktails for 15 days 2 times a day. Obligatory was the change in the mode of football training: inclusion in the program of special preparations for the development of endurance.

Therapeutic gymnastics was also a component of rehabilitation. Each child of the 1st group performed it individually, at home, after awakening in front of the shower and breakfast. Therapeutic massage was used throughout the rehabilitation period and was performed 2 times a week. Rehabilitation included 3 courses of cry therapy. Each course was conducted for 10 days 1 time per day for 2 minutes in the evening. 1 course was conducted at the initial stage of rehabilitation, 2 10 days after the end of 1 course and 3 - 10 days after the end of the second course. Ozone therapy was carried out one course at the beginning of rehabilitation of 5 procedures, which were conducted every other day.

Hydrotherapy included a shower and a bath. In the morning, the children took a contrast shower (Scottish: first 35-40 °, then 10-20 °); in the evening - a warm fan shower (25-30 °). Once a week, the children took an optimal temperature (36-37 ° C) before going to bed, followed by a rain shower of 35-36 °.

In tests of pull-up on the crossbar and push-ups from the ground, the indicators for one minute were estimated. The Stange test was performed, which is characterized by the duration of the delay in breathing after the maximum inspiration. The test was conducted while sitting. Evaluation of a sample with a breath delay on inspiration: excellent \rightarrow 60 s; well - 45-60 s; satisfactory - 30-45 sec. [16].

The threshold of anaerobic metabolism (concentration in the blood of lactic acid) was determined. The objective indicators were assessed: heart rate (heart rate), blood pressure before and after the load. According to the obtained data, the Curdo index = D / P was calculated, where D is the diastolic pressure, P is the pulse, which is normally close to 1. Also calculated coefficient of economization of blood circulation, reflecting the release of blood in 1 minute $((BP \text{ systolic} - BP \text{ diastolic}) \times P)$, where BP – blood pressure P – pulse). Normally it is around 2600. It is about beginning disorders in the cardiovascular system [17].

To determine the dynamics of the condition of young athletes and the ability to compare the results obtained in both groups of athletes, determined indicators were taken into account in the outcome, after 1 and 2 months of rehabilitation.

The results were processed by Student's criterion (t). Statistical processing of received information was made with the help of a program package "Statistics for Windows v. 6.0", "Microsoft Excel". Differences in data were considered reliable in case of $p < 0.05$.

RESULTS AND DISCUSSION

The results obtained in the course of the study are shown in Table 1. In assessing the baseline in both groups, no statistically significant observations were found for all the indicators considered. In both groups there was a decrease in the endurance of young athletes, their resistance to hypoxia, the threshold of anaerobic metabolism, and the functional readiness of the cardiovascular system. During the rehabilitation activities in both groups, a positive dynamics of the parameters considered was revealed, more pronounced in the first group.

Footballers of the 1st group, after 2 months of rehabilitation activities, noted an improvement in overall well-being and mood. Sleep normalized, a feeling of fatigue did not arise, and sore throat, muscle aches and pains in the knee joints also did not disturb them. In young players with Down syndrome 2 groups, the feeling of fatigue persisted after a long rest, there was drowsiness during the day. They also noted pain in the throat, diffuse muscular pain, and pain in the extremities and in the knee joints, which periodically interfered with training. Some of the players of the 2nd group during the observation period missed training due to poor health and fatigue.

When comparing endurance and resistance to hypoxia in football players 1 and 2 groups as a result of the rehabilitation can be noted increase in these indicators during the whole observation. At the same time, the results achieved in the first group were more preferable. This proves the higher effectiveness of the author's rehabilitation program in maintaining the physical form of young footballers with Down syndrome. This was also confirmed by comparing the endurance and hypoxia resistance of the players of both groups during the entire observation period. It becomes clear that the complex of rehabilitation measures developed and applied by the authors is able to provide a more complete physical recovery and helps young football players with Down's syndrome to achieve good physical performance and sporting outcomes [18, 19].

This was also confirmed by the values of hemodynamic parameters obtained in the course of rehabilitation [20, 21] and the values of the computed Kerdo indices and the coefficients of the circulatory economy (Table 1).

It is established that against the background of the author's version of rehabilitation measures, young players with Down's syndrome may have a more marked improvement in hemodynamic parameters, a decrease in lactic acid concentration and, consequently, an optimal increase in resistance to hypoxia [22]. The observed players of the second group have a more modest improvement in hemodynamic parameters with their achievement of a sub physiological level, as well as a somewhat excessive level of lactic acid concentration in the blood [23].

This indicates the preservation of elements of asthenic syndrome and the possibility of the transition of functional pathology to organic pathology [24]. The received data also speak about positive influence of the technique of rehabilitation used in the first group for liquidation of an asthenia and increase of adaptable possibilities of an organism to sports loads.

Table 1: Dynamics of the indicators taken into account in the surveyed (M±m)

No group	Rehabilitation Month	Strength endurance, the number of push-ups from the ground in 1 minute	Strength (pull-up on the crossbar), number	Stability to hypoxia (Stange assay), s	Heart rate before exercise, number	Heart rate after exercise, number	Systolic blood pressure, mmHg	Diastolic blood pressure, mmHg	Concentration of lactate, mg%	Kerdo index, points	Coefficient of economic circulation, points
1 n=10	0	14.5±0.21	4.3±0.20	49.8±0.27	84.3±0.39	189.1±0.66	100.3±0.35	60.8±0.46	28.3±0.16	0.72±0.008	3428.5±2.34
	1	17.8±0.22 p<0.01	6.9±0.31 p<0.01	55.8±0.34	76.8±0.46 p<0.05	174.0±0.54 p<0.05	109.8±0.28 p<0.05	67.6±0.55	21.2±0.18 p<0.05	0.93±0.010 p<0.01	3026.5±2.12 p<0.05
	2	19.1±0.29 p<0.01	9.2±0.29 p<0.01	62.8±0.30 p<0.01	63.5±0.42 p<0.01	150.4±0.73 p<0.01	119.6±0.25 p<0.01	74.2±0.76 p<0.01	14.1±0.25 p<0.01	1.15±0.009 p<0.01	2700.6±1.87 p<0.01
2 n=10	0	14.2±0.24	4.5±0.23	50.2±0.33	83.9±0.41	186.5±0.62	101.8±0.29	61.5±0.39	28.9±0.19	0.74±0.010	3385.0±2.46
	1	15.0±0.38	5.1±0.36	52.2±0.39	79.3±0.38	182.1±0.70	103.5±0.25	63.8±0.48	24.2±0.30	0.82±0.011 p<0.05	3002.6±2.03
	2	16.3±0.17 p<0.05 p ₁ <0.05	6.3±0.27 p<0.01 p ₁ <0.01	56.7±0.36 p<0.05 p ₁ <0.05	74.0±0.53 p<0.05 p ₁ <0.05	172.3±0.67 p<0.05 p ₁ <0.05	109.3±0.34 p<0.05 p ₁ <0.05	70.1±0.65 p<0.05	18.3±0.24 p<0.05 p ₁ <0.05	0.98±0.014 p<0.01 p ₁ <0.01	2911.4±2.30 p<0.01 p ₁ <0.05

Legend: p - reliability of the dynamics of the indicators considered, p₁ - reliability of differences between groups in terms of observation. Reliability of differences in baseline indicators was not detected.

CONCLUSION

The complex of rehabilitation measures, including a rational diet, therapeutic gymnastics, therapeutic massage and hydrotherapy is very effective in terms of eliminating soccer players 12-13 years old with Down's syndrome and preparing them for strenuous training. This was shown by comparing the indices of physical endurance obtained against the background of this complex, the resistance to hypoxia and the parameters of hemodynamic in athletes of football players 12-13 years old with Down's syndrome with similar indicators of a comparable group of players with Down's syndrome, which were restored using a standard technique.

The indicators of the players of the 2nd group were lower than those obtained as a result of using the author's technique. The observed group 1 after the end of the rehabilitation period showed not only the restoration of the indicators taken into account, but also an improvement in the subjective assessment of their well-being. The received data also speak about positive influence of the technique of rehabilitation used in the first group for liquidation of asthenia and increase of adaptive possibilities of an organism with an opportunity of participation in intensive trainings.

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