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Possibilities Of Application Of Means Of Treatment Physical Culture For Correction Of Excessive Body Mass at Young Persons.

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ABSTRACT

The article highlights modern approaches to the therapy of obesity. The greatest attention is paid to correcting excess body weight with the help of physiotherapy exercises. The basis for conducting physical exercises is the principle of determining the magnitude of the maximum loads, establishing their acceptable level and adapting those engaged in gradually increasing loads. Each stage of rehabilitation is built on the basis of the individual capabilities of patients, resulting in the formation of signals (reflex, hormonal, local metabolic), which contribute to the emergence of general nonspecific reactions of the body aimed at reducing body weight and correcting the metabolic status in response to the physical impact of exercise therapy.

Keywords: Physical culture, body mass, young persons, body weight.

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INTRODUCTION

Overweight and obesity are currently one of the important problems of medicine and science. This is largely due to the widespread prevalence of obesity among all age groups of the population, the low effectiveness of therapeutic measures aimed at weight reduction, the discovery of new drugs for the treatment of this pathology, new achievements in understanding the pathogenesis of obesity, the discovery of the hormone adipose tissue - leptin, betta-3- adrenergic receptors.

In the modern world, obesity can be classified as one of the most common chronic diseases. According to the World Health Organization (WHO), over 30% of the world's population suffer from overweight or obesity. In our country, over 40% of the population has excess body weight, while 26% of them overweight can be regarded as obesity.

Obesity is a risk factor for the development of arterial hypertension, diabetes mellitus, coronary heart disease, atherosclerosis and other concomitant diseases. The risk of developing concomitant diseases is determined by the same features of adipose tissue. The most unfavorable for health is the abdominal type of obesity, combined, as a rule, with a complex of hormonal and metabolic disorders.

The reason for the widespread overweight in modern society is the changes in the way of our life that have taken place in recent decades: thanks to technical progress, the level of physical activity of modern man has significantly decreased, the lifestyle has become inactive, while the ration has significantly increased the number of high-calorie foods with a high fat content and low in fiber.

In this connection, the rehabilitation with the use of physical exercises in this disease seems to be reasoned enough. Meanwhile, the basis for conducting physical exercises is the principle of determining the magnitude of the maximum loads, establishing their acceptable level and adapting those engaged in gradually increasing loads. To ensure the effectiveness of training sessions, it is necessary to activate the functional reserves of the cardiovascular system. Unfortunately, among a large number of methods for expanding the motor activity of people, the criteria for the magnitude of the maximum loads are insufficiently defined, taking into account the functional status of each practitioner. Based on the above data, each stage of rehabilitation should be based on the individual capabilities of patients, and therefore it is necessary to make a plan for training loads at the optimal level, i.e. in each case, establish an individual step-by-step program of physical exercises.

Currently, new schemes, methods and techniques are being developed to treat obesity, applied separately and in a complex manner. The main goal of treatment of overweight and obesity is to reduce body weight, improve anthropometric indicators, correct hormonal and metabolic disorders and prolonged retention of the results achieved. Modern approaches to the treatment of obesity with the use of methods of physiotherapy are a promising direction and require a pathogenetic justification for their use.

All of the above required once again to focus on the technique of physical exercise in obesity in accordance with the status of each engaged in the development of techniques for individual physical activity programs, andas well as on specific methods for the stages of physical rehabilitation, which is the main content of this work.

MATERIALS AND METHODS

To achieve the goal and objectives of the study, 295 students who visited the student sports and fitness center of the medical university were examined.

Criteria for inclusion in the main clinical groups: young people aged 18 to 25 years with excessive body weight and alimentary constitutional obesity with a body mass index (BMI) of 25 kg / m2 and more.

The control group for comparison of anthropometric and hormone-metabolic markers of obesity consisted of 20 practically healthy young people (mean age 21.9 ± 0.11 years) with normal body weight (BMI - 18.5-24.9 kg / m^2).

Anthropometric and hormonal-biochemical examinations were performed before the treatment, 1 and 3 months after the end of treatment. Anthropometric examination included measurement of height, body weight (MT), waist circumference (OT) and hips (OB). According to anthropometry, the body mass index (BMI) was calculated.

On an automatic biochemical analyzer BS-400 (PRC, Mendray), the concentration of glucose, total cholesterol (OC) and high density lipoprotein cholesterol (HDL cholesterol) in the blood serum was determined by enzymatic colorimetric method using certified reagent kits (Analiticon Biotechnologies AG, Germany), triglycerides (TG) - using a certified set of reagents (Biosub® TG, Germany).

Patients of clinical groups with overweight and obesity underwent a course of therapeutic physical training according to the traditional technique of V. K. Dobrovolsky. Classes were held 5 times a week for 60 minutes. In the control and main groups, the examinations were conducted at the same time.

Dynamic gymnastic exercises were applied to medium and large muscle groups, alternating with relaxation exercises and static and dynamic breathing exercises. Gradually included exercises with burdening (with the shells-medical and 1kg, 2kg, dumbbells - 1kg, clubs). Preference was given to exercises that are fly-away and performed without delaying breathing. In the case of violations of static-dynamic stability, elements of vestibular training were conducted-walking with a different change in the direction of movement, with the turning off of the vision, with the inclusion of various initial positions.

At the first preparatory stage, there is no significant difference in the methods of study between the primary and control groups. At the second, training stage between the main and control groups, there is a significant difference: in contrast to the control group, here the training was carried out with the help of control and regulation of physical exertion by the method of reverse biological communication, which in turn, in connection with our proposed system of telemetric control of the frequency of cardiac abbreviations, made it possible to change the intensity and duration of physical exertion without changing the pre-programmed heart rate program. In the main group, the application of the individual control system made it possible to more accurately implement the physical load program, bringing it to the sub-tolerant and tolerant levels, as well as fully individualize the physical load in group sessions.

At the end of each week of the preparatory and training stages of rehabilitation, the following research methods were conducted: anthropometric measurements, biochemical, bicycle ergometric studies, determination of the "critical pulse".

In addition, recommendations were given on low-calorie nutrition (1800 kcal / day) with restriction of fats and digestible carbohydrates. The control group did not receive a course of physical therapy.

The statistical processing of the material was carried out using the Statistis 6.0 software package (StatSoft, USA). For a comparative analysis of clinical groups, a one-way ANOVA, F-test, was used, followed by multiple comparisons using the Newman-Keils test. ANOVA was used for the analysis of repeated observations. Probability of validity of the null hypothesis (p) was taken at 5% significance level (p = 0.05).

RESULTS AND THEIR DISCUSSION

Of the total number of subjects surveyed, the vast majority of students were overweight and obesity of I and II degrees. Depending on the size of the BMI (WHO, 1997), the subjects were divided into clinical groups. Group 1 consisted of 135 people with an overweight (BMI 25.0-29.9 kg / m), group 2 - of 120 young people with obesity of the I degree (BMI 30.0 - 34.9 kg / m), group 3 - out of 40 obese patients with grade II (BMI 35.0 kg / m). Of the total number of obese students surveyed, the android type of obesity was detected in 131 (41.33%) and the gynoid type in 164 (58.67%) patients.

It was established that after a course of therapeutic physical training in all clinical groups there was a decrease in body weight: in group 1 - by 2.84 from the baseline, in group 2 - by 1.84-6.28% and in group 3 - by 3, 14-5.97%, respectively (for all indicators, p = 0.0001). A more pronounced decrease in MT in a group of students with an overweight. It should be noted that the dynamics of the decline in MT in persons with CS was

significantly higher than in students with AOs (by 3.01-7.29% and 2.26-6.3%, respectively, at the study stages with p = 0.0001).

It was found that a more pronounced decrease in OT was noted in students with AO and obesity of grade 2. This proves a higher metabolic activity of visceral fat.

It was found that in students with excess body weight and obesity of I and II degree before treatment, serum leptin concentration was higher than in patients of the control group. It is natural that the more mass of adipose tissue, the more it secretes into the blood of leptin. When analyzing the data of the study, it was found that patients with obesity of grade II and AO had a higher leptin concentration. Decrease in MT, decrease in OT and OB is accompanied by a decrease in serum leptin concentration (p = 0.05) under the influence of a course of therapeutic physical training.

In the group with obesity of grade II, a direct relationship between the concentration of leptin and MT (r = 0.47-0.53, p = 0.05), with RT (r = 0.71-0.58, p = 0.01) at all stages of the study. Leptin was approximately equally correlated with BMI (r = 0.55-0.60, p = 0.001) and RT (r = 0.61-0.55, p = 0.001) in the AO group. In the group of patients with GI before treatment, only the tendency of a link between the concentration of leptin and RT (r = 0.27, p = 0.07) was found, and after the course of treatment a statistically significant direct correlation between these indices (r = 0.42-0,50; p=0.01). Consequently, the level of leptin reflects the presence of more fat mass in the abdominal area with obesity.

It was found that before treatment, serum insulin concentration was significantly higher in women with obesity of grade II and in the android type of fat distribution. The presence of insulin resistance in these clinical groups was confirmed by the values of the HOMA-IR index (2.69 ± 0.11 and 2.26 ± 0.14, respectively). The high concentration of insulin in patients with obesity of grade II is determined primarily by the nature of the distribution of fat (with OT / OB r = 0.52, p = 0.02), the presence of adipose tissue in the abdominal region (with OT r = 0.54, p = 0.02) and to a lesser extent - the degree of obesity (with a BMI of r = 0.43, p = 0.06). In the analysis of correlations of anthropometric indices with insulin concentration at AO, the presence of direct IRI-BMI (r = 0.60, p = 0.001), RT (r = 0.62, p = 0.001) and OB (r = 0.51 ; p = 0.01). In the group with GO before the treatment, the closer interrelations of IRI with OT and OT / OB in the group of women with AS have been established, confirming the literature data on the higher degree of insulin resistance in individuals with fat deposition in the abdominal area. In groups with obesity of I and II degree, there was a direct relationship between levels of leptin with insulin (r = 0.49-0.63, p0.05) and the HOMA index (r = 0.51-0.66, p = 0, 05), which indicates the participation of leptin in the formation of insulin resistance.

It was established that right after the course of therapeutic physical exercise, the concentration of serum insulin in groups of students with excess body weight and GO decreased relative to baseline values, and in groups of students with obesity and AO increased. The increase in insulin production under the influence of therapeutic physical education in groups with the presence of insulin resistance is vagus-induced. Relative (functional) hyperinsulinemia is revealed, which under conditions of "passive physical activity" provokes a decrease in blood glucose level due to its increased utilization by insulin-dependent tissues.

With further observation, it was found that the concentration of insulin in groups with excess body weight and GO is lower than the baseline, and in obesity and AO groups it is higher than the baseline values, which is probably due to the presence of insulin resistance.

It was found that the concentration of cortisol in the control group before treatment was statistically significant (p0.05) higher than the corresponding values in the groups with overweight, obesity of I and II degree (1.2 times, 1.21 times and 1.24 times respectively).

With obesity, the rate of cortisol secretion and its metabolic clearance increase without increasing its level in the blood. It was established that immediately after the course of therapeutic physical training the concentration of cortisol in the serum of blood in patients of clinical groups increased by 21.2-34.7%, which allows to speak about the response of the hypothalamic-pituitary-adrenal system. One month after treatment, it was found that in the group of students with excess body weight and GO, the concentration of cortisol in the serum is higher than the baseline values, and in obese groups there is a statistically insignificant decrease in its level relative to baseline values. In 3 months after the end of treatment in all clinical groups, its concentration

exceeds the initial values (p = 0.05). An increase in the concentration of cortisol may be due to a decrease in the availability of the energy-glucose substratum. This reaction is aimed at stimulating gluconeogenesis to maintain a sufficient concentration of blood serum glucose due to the restriction in the diet of carbohydrates.

The study of the lipid profile of blood serum in patients with different degree and type of obesity before treatment and at various times after the course of therapeutic physical training showed that for patients of clinical groups during primary treatment, a statistically significant increase in serum concentrations of TG, OXC, LDL cholesterol and decrease in HDL cholesterol in comparison with the control group and optimal values. More pronounced changes were characteristic of the group with obesity of grade II and AO. Elevated CAT was detected in 46% of students with overweight and obesity.

It was found that the decrease in the serum triglyceride concentration is due to adrenergic stimulation and activation of stress-releasing systems under the influence of therapeutic physical training. The indirect influence of the physical load on cholesterol metabolism is revealed, this is indicated by a statistically significant decrease in the concentration of total cholesterol, low-density lipoprotein cholesterol and the atherogenic coefficient, and the increase in anti-atherogenic high-density lipoproteins. After 3 months after the end of treatment, the results are preserved.

A statistically significant correlation of leptin with OX and TG before treatment (r = 0.39, p = 0.03 and r = 0.45, p = 0.01, respectively) was found in students with AO, which confirms the participation of leptin in the pathogenesis of dyslipidemia at this type of obesity.

CONCLUSIONS

Thus, the analysis of the obtained data demonstrates that in response to the physical impact of therapeutic physical training, signals (reflex, hormonal, local metabolic) are formed, which contribute to the emergence of general nonspecific adaptive reactions of the organism.

In this regard, it is reasonable to hold all persons with overweight and obesity of the course of therapeutic physical training with the goal of implementing a weight loss program in patients with obesity of I and II degrees. To maintain the achieved results, patients should adhere to a low-calorie diet with restriction of fats and digestible carbohydrates.

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