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PATHOGENETIC APPROACH WHEN CHOOSING METHODS OF CONSERVATIVE TREATMENT OF OBESITY AND CORRECTION OF EXCESS BODY WEIGHT

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Abstract: Every year, the number of overweight and obese people around the world is steadily increasing, and the "obesity epidemic," according to WHO experts, is becoming an increasingly acute medical and social problem that threatens not only the health of society as a whole, but also the economies of different countries. [1].

Key words: obesity; excess body weight; hypokinesia; optimization of motor mode; physical exercise; training heart rate range; heart rate monitors; hypocaloric diets; rational drug therapy; orlistat; sibutramine; psychological correction.

The prevalence of obesity is rapidly increasing among people of different ages, genders, social status and ethnicity. This negative trend is typical for developed countries in Europe, North America and Australia [1, 2]. The United States retains the leading position among countries with high incidence, where 34% of the population is overweight and 27% is obese. In most European countries, more than 50% of the population is overweight, and the prevalence of obesity reaches 10–25% in men and 10–30% in women [1–3]. In Russia, the problem of combating excess body weight is no less acute [4, 5]. According to domestic researchers, the prevalence of overweight among the adult population of Russia in recent years has been 60% for men and 59.2% for women. Overweight is observed in 20% of children and adolescents aged 5 to 17 years (21.9% in boys and young men and 19.3% in girls and women). At the same time, the incidence of obesity in children and adolescents aged 5 to 17 years was 6.8% for males and 5.3% for females, and in adults the incidence of obesity was 21.9 and 29.7%, respectively [6, 7]. According to specialists from the Russian Association of Endocrinologists, two out of three obese Russians develop type 2 diabetes mellitus, 35% develop coronary heart disease, and 15% develop stroke. The incidence of obesity-related diseases reflects not only the medical and social significance of the problem, but also serious economic losses. The contribution of this pathology to the total annual state costs for the treatment and management of patients with acute cerebrovascular accident is 10.7 billion rubles, with acute myocardial infarction - 12.5 billion rubles, with type 2 diabetes mellitus - 346.3 billion rub. In total, this amounts to 70% of the total budget funds allocated for the treatment of patients with socially significant diseases in Russia. In this regard, academician RAS President of the Russian Association of Endocrinologists I.I. Dedov, calling obesity a "problem of a national scale," calls for "updating the serious consequences of obesity and overweight" and the need to develop a national program to combat obesity [8]. The European Clinical Guidelines for the Treatment of Obesity in Adults emphasize that "adequate treatment of obesity should be based on realistic goals to reduce body weight and thereby reduce health risks; it should include initiating weight loss, maintaining the achieved result and preventing weight gain again" [2].Since it is a sedentary lifestyle and a significant

decrease in physical activity that are the decisive factor in the development of obesity in people of different ages, physical activity is of key importance in the treatment of obesity and its associated diseases [2, 9-14]. Changes in diet affect body weight in the short term, while optimal motor mode and regular physical activity provide a lasting effect, becoming the most important prognostic factor for maintaining the achieved result in the future [2, 11, 13]. Other undeniable positive effects of physical activity, in addition to reducing excess body weight (and regardless of the dynamics of body weight), include general improvement of the body, increasing the functionality of the cardiovascular and respiratory systems, increasing the body's resistance to adverse factors, reducing general morbidity, improving the psycho-emotional state and quality of life [2, 13, 15]. Low- and medium-intensity aerobic physical activity, which involves a large volume (at least 2/3) of muscle groups, is considered the most effective for the treatment and prevention of obesity. Such loads include walking, running, jogging, cycling, skiing, using cyclic exercise machines, swimming, aerobics and dancing [11, 16]. The best results in correcting excess body weight are observed when using cyclic exercise machines (exercise bike, treadmill, rowing machine) [17]. Most authors emphasize the advisability of long-term, low-intensity exercise—long walking, skiing, cycling, and swimming. At the same time, running is not recommended for overweight patients due to the large destabilizing load on the spine and joints, leading to injuries and diseases of the musculoskeletal system [16, 17]. The most optimal and physiological type of aerobic physical activity for people with overweight and obesity is walking. It has virtually no contraindications, does not require expensive equipment, specially equipped training areas, and can be performed anywhere, in urban environments and in nature. Currently, Scandinavian or Nordic walking is becoming increasingly popular in Europe and Russia. It is the optimal method of physical activity for a wide range of the population due to its accessible teaching methods, year-round availability and economic attractiveness. Being an aerobic exercise, it retains all the advantages of regular walking before running, which is especially important for people with overweight and obesity. With any type of walking, compared to running, there is no general discomfort, a large impact load on the spine and large joints, severe shortness of breath, or an excessive increase in blood pressure. Nordic walking has a number of significant advantages.The use of special poles when walking reduces the load on the joints and spine, connects the muscles of the upper limbs, shoulder girdle and torso to work, increasing energy consumption when performing exercise and enhancing its fat-burning effect. These advantages make Nordic walking a new direction in physical rehabilitation, relevant not only for obese patients, but also for patients with diseases of the cardiovascular, respiratory and musculoskeletal systems [18, 19]. Recommendations for optimizing the motor mode for practically healthy people and overweight patients pay special attention to walking; the volume (required number of steps), speed and duration of walking are regulated for each category of patients of different ages, health conditions and levels of physical fitness [11, 17 , 20-22]. Thus, with a load of 3000-6000 steps per day, the lifestyle is considered sedentary, 7000-10,000 steps per day - moderately active; 11,000-15,000 steps per day - very active. Walking at an average speed of 3-4 mph (~4.8-6.4 km/h), i.e. brisk walking, can burn about 3000 kcal per week (430 kcal per day) [23, 24]. In the absence of excess caloric intake, such exercise can help reduce body weight by 2-3 pounds (~900-1300 g) per month [24].

The 2010 WHO Global Guidelines for optimizing physical activity emphasize that minimum physical activity should be at least 30 min of moderate-intensity exercise almost every day or (better) daily, with an average of 150 min per week [9]. In order to increase the reserves of the cardiovascular and respiratory systems, prevent overweight and obesity, strengthen musculoskeletal tissues, and reduce the risk of developing non-communicable diseases and depression, various physical activities are recommended. For people aged 18 to 64 years, at least 150 minutes per week of moderate-intensity aerobic exercise or at least 75 minutes per week of vigorous-intensity aerobic exercise is required. For people aged 65 years and older, basic physical activity includes mobile activities, professional activities, household chores, physical exercise and recreational exercise during leisure time [9]. According to American experts, training with

moderate intensity - from 150 to 250 minutes per week - is quite effective for reducing excess body weight. To achieve and maintain clinically significant results, however, moderate-intensity aerobic exercise is required—200 to 300 minutes per week. Weight training does not reduce body weight, but it can increase lean body mass. In any case, even in the absence of significant reduction in body weight, regular aerobic and strength exercise improves the functioning of the cardiovascular system and reduces the risk of developing comorbidities associated with obesity [22]. To ensure the effectiveness and safety of health-improving physical activity, special attention is paid to determining the optimal intensity of the activity; in this case, various methods are used: from subjective (Borg scale) to the most accurate, requiring the use of complex diagnostic equipment (ergometers, electrocardiographs, gas analyzers [2, 16, 17, 21, 25]. Most often, dosing of physical activity is carried out by calculating training (target) pulse zones, which are ranges of predetermined percentages of the individual maximum heart rate (HRmax). HRmax in most cases for practically healthy people is calculated by the formula: HRmax = 220 - age in years [21, 25, 26].

For people with health problems, including those suffering from obesity, and older people, it is advisable to determine heart ratemax based on the results of bicycle ergometer stress testing under ECG monitoring [13, 16, 25, 26]. Most sources provide the following ranges of training heart rate zones by load intensity: 50-60% of heart ratemax - low-intensity load; 60-70% of heart ratemax - moderate intensity load; 70-90% of heart ratemax - high intensity load; more than 90% of heart ratemax is maximum load. The target zone for reducing body weight corresponds to ranges from 60 to 80% of heart ratemax, which are specified depending on age, functional state of the body and the presence of concomitant diseases [13, 21, 26]. The total volume of training loads is determined by their intensity and duration, between which there is a certain relationship. The duration of high-intensity exercise (80% of heart ratemax) should not exceed 6-8 minutes. With moderate intensity loads (about 70% of heart ratemax), the duration can be within 20-30 minutes. During long-term (1-2 hours) exercise (health walking, running, skiing), the intensity should not exceed 60% of heart ratemax [11, 21]. The intensity of training loads is currently most accurately determined by the level of achieved maximum oxygen consumption per unit of time - MOC - an integral indicator of the functional state of the cardiovascular and respiratory systems, which is a measure of the aerobic performance of the body. There are direct and indirect (calculated) methods for determining BMD, among which the most accurate is direct, obtained from the results of spiroergometric testing with the maximum load for the test subject [16]. A number of authors suggest using metabolic equivalents (MET) for dosing physical activity. These are calculation units that represent the amount of energy consumed by the body to maintain metabolism in 1 minute. The MET number determines how many times oxygen consumption during exercise increases compared to that at rest. Conventionally, the basal level of oxygen consumption is equated to 3.5 ml per 1 kg of body weight per 1 min. Moderate intensity physical activity corresponds to an indicator of 3-6 MET, high intensity - more than 6 MET [9, 13, 17], however, these methods of load dosing (in terms of MIC and MET) require the use of special expensive medical equipment and experienced medical personnel, therefore, Despite their information content and accuracy, they are currently not widely used in the practice of mass surveys [12]. Regardless of the methods used for dosing physical activity, objective monitoring of the dynamics of physiological indicators directly during the training process remains an urgent task.Currently, heart rate monitors are used to record second-by-second heart rate (HR) and accurately assess the amount of physical activity performed. Heart rate monitoring allows you to make the training process completely controlled, manageable, maximally effective, and most importantly, safe [16, 21]. Clearly, successful management of overweight and obesity requires a lifetime of effort. And if the tasks of public health and the state include timely information, provision of an accessible environment, qualified medical care, then maintaining a healthy lifestyle, active participation in the process of healing and disease prevention is an aspect of personal responsibility [1, 11]. From the point of view of nutritionists and endocrinologists, an important condition for effective pathogenetic treatment and prevention of overweight and obesity is a balanced diet [27-30]. Most experts in this field believe that to reduce excess

body weight, a significant reduction in the caloric content of the daily diet is necessary, with a mandatory reduction in portion sizes. Nutritionists advise avoiding snacks between meals, not skipping breakfast, giving up large late dinners, eliminating eating at night, and also increasing the consumption of grains, cereals, dietary fiber, vegetables and fruits, replacing meat and high-fat foods with alternative ones foods with lower fat content [13, 31, 32]. At the same time, the restriction of calorie intake should be strictly individual, taking into account age, eating habits, previous experience of diet therapy, physical activity, and the presence and severity of concomitant diseases [33].replace meat and high-fat foods with lower-fat alternatives [13, 31, 32]. At the same time, the restriction of calorie intake should be strictly individual, taking into account age, eating habits, previous experience of diet therapy, physical activity, and the presence and severity of concomitant diseases [33].replace meat and high-fat foods with lower-fat alternatives [13, 31, 32]. At the same time, the restriction of calorie intake should be strictly individual, taking into account age, eating habits, previous experience of diet therapy, physical activity, and the presence and severity of concomitant diseases [33].

Despite the abundance of modern trends in the field of healthy eating, the classical principles of dietetics remain relevant: supplying the body with all nutrients (fats, proteins and carbohydrates) in certain proportions; satisfying the body's energy needs according to the principle of matching the energy value of the diet with daily energy consumption, depending on age, gender, body weight, and level of physical activity; completeness of the diet - meeting the body’s needs for vitamins, minerals and dietary fiber; correct diet, including 6 meals a day, as well as optimal drinking regimen [13, 29]. The most effective methods for reducing excess body weight include hypocaloric diets. A reduction in energy consumption (calories) by 15-30% compared to the usual level is quite sufficient and adequate. In this case, the recommended energy deficit (the difference between consumed and expended calories) should be approximately 600 kcal/day, which will lead to a decrease in body weight by an average of 0.5 kg per week [2, 13]. To date, there is no convincing evidence that diets with a special ratio of macronutrients (low fat, carbohydrates, high protein, etc.) are more effective than classic hypocaloric diets. When analyzing the diet of obese patients, one should take into account the fact that when filling out a food diary, they often report inaccurate information about caloric intake [2, 31, 32]. To compare a low-carbohydrate diet, or LC (low-carbohydrate), and a low-fat diet, or LF (low-fat), A. Nordmann et al. [31] conducted 5 large-scale studies, a meta-analysis of which showed that the LC diet leads to a greater reduction in body weight than the LF diet at 6 months, but the opposite trend was found at 12 months. The LC diet was associated with lower triglycerides and higher levels of HDL-cholesterol (High-density lipoprotein), but the LF diet resulted in lower levels of total cholesterol and LDL-cholesterol (Low-density lipoprotein). low density). Diets with very low calorie content (less than 800 kcal/day) can only be part of a comprehensive treatment program. Their use should be limited to specific cases and short periods of time. Since such diets pose a health hazard, they are contraindicated for children, adolescents, pregnant and lactating women, as well as the elderly [2, 13, 29, 30]. In addition to adjusting the individual diet for the successful treatment and prevention of obesity, most nutritionists and endocrinologists note the need to combine a balanced diet with increased physical activity [2, 13, 34]. Thus, M. McQueen [11] confirms that the combination of diet therapy with physical activity significantly increases the effectiveness of weight loss compared to the isolated use of diet and exercise.In some cases, the most effective method of treating obesity is rational drug therapy, since not all patients can radically change their lifestyle and eating behavior. Often, optimizing the motor mode and correcting the diet is not enough to reduce excess body weight, which was confirmed by the results of the All-Russian observational program for monitoring the safety of weight loss in the treatment of patients with alimentary obesity in clinical practice. This large-scale domestic program (working title “PrimaVera”), approved by the Independent Interdisciplinary Committee for Ethical Review of Clinical Research and registered in the international registry of clinical trials, was carried out in Russia in 2012-2015. More than 3 thousand doctors of various specialties (endocrinologists, gynecologists, therapists,

cardiologists, neurologists) from 142 cities of Russia participated in this program; the number of observed patients reached 100 thousand people [35, 36]. The scientific goal of the program was to introduce into clinical practice a system of complex drug therapy for obesity, including selection and screening of patients, monitoring individual response to therapy, monitoring its effectiveness and safety, and the dynamics of the emotional state of patients. As part of the program, under the supervision of physicians, obese patients took the drug sibutramine to reduce body weight; the duration of treatment was 6 months in 59.3% of patients and 12 months in 37.7% of patients [37]. The results of the study were presented in March 2016 in Moscow at the VII All-Russian Congress of Endocrinologists as part of a special scientific symposium "Obesity Management Strategy." It has been shown that timely diagnosis of obesity and the prescription of drug treatment to those patients who really need it, as well as monitoring therapy and adjusting the dose of the drug, can achieve safe and effective weight loss. As a result of treatment, 59% of patients got rid of the diagnosis of obesity, more than 28% of program participants achieved ideal body weight, 12.6% of patients got rid of the diagnosis of morbid obesity, 83% of program participants achieved a clinically significant reduction in body weight by 10% and more. It has been established that safe weight loss under medical supervision reduces the risk of premature death by 20%, the risk of developing type 2 diabetes mellitus by 58%, and the risk of developing arterial hypertension by 15% or more [36]. It is believed that drug treatment is appropriate in those patients with obesity (body mass index more than 30 kg/m2), including patients with risk factors for developing type 2 diabetes mellitus, who, using diet and exercise alone, cannot achieve or maintain clinical a significant degree of weight loss to improve glycemic control and reduce the risk of developing type 2 diabetes. In addition, drug therapy is indicated for patients with a body mass index of 27 kg/m2 or more, having visceral obesity in the presence of risk factors or diseases associated with excess body weight. Indications for drug treatment include arterial hypertension and type 2 diabetes mellitus that accompany obesity.

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