Effects of the rehabilitation process on somatometric indicators and the body composition of women with alimentary obesity.

Osh
Kaipova Ajamal Kochkorbaevna
Belov G.V.
SYED ALI ABBAS RAHAT

Obesity is often consider as characteristics of appearance, physical type for someone attractive and for someone not. With obesity, not only lipid metabolism suffers, general reaction of body decreases, the immune system, resistance to stress and psychological changes [2]. Diagnosis of obesity, with all the obvious evidence is not easy, because there are no clear criteria for difference from the normal - an overweight is often not a sign of healthy or sick. Recently, computerized technologies and methods have appeared that make it possible to more accurately diagnose the extent of lipid metabolism disturbances and to evaluate the biological characters of the revealed abnormalities [7, 11, 12].

Restorative treatment of the metabolic syndrome should be complex and not instantaneous [3, 4, 5] . Although the rapid weight reduction that is directed by many programs offered at resorts and health centers .They often use hydrocolonal therapy and various laxatives, for a week or ten days and the patients loses 10-15 kg , but you can't say it is pathogenetic treatment. Metabolic and functional abnormalities are not corrected and the patients gain weight quickly. [6, 10] .

The purpose of the study scientific complex program of medical and social rehabilitation of women with obesity and evaluation of its effectiveness by a health center in Osh.

Study design

A study was conducted on 20 women of reproductive age in Osh with metabolic syndrome, who underwent a four- week rehabilitation course in the health center in the summer of the year 2016 . The women age ranges from 25 to 45 years and the average age is 38.2 ± 1.7 years.

Criteria for inclusion in the main group:

1. Informed consent of women for research and implementation of the proposed program.
2. Relative health, absence of current infectious and somatic diseases .
3. Overweight exceeding the normal values by more than 10%, body mass index (BMI) is more than 25 kg / m^2 , the thickness of the skin fold on the abdomen is more than 3 cm.

The control group consisted of 20 women living in city Osh , of the same age 38.8 ± 1.7 years with normal body weight. All those surveyed had a similar lifestyle, were representatives of the occupations of mental work.

Complex rehabilitation program included:

1. Diet therapy with restriction of fats and carbohydrates. The amount of fat in the daily diet is reduced to 0.7-0.8 g / kg, with vegetable fats (1.3-1.4 g / kg) present, sharply limiting the amount of carbohydrates to 2.5-2.7 g / kg (daily rate of 5.2-5.6 g / kg), primarily due to the exclusion of sugar, bread, bakery products, hydrated drinks, etc. The amount of proteins in food remains normal - 1.3-1.4 g / kg or slightly higher, which prevents the loss of tissue protein, increases the consumption of energy by absorbing proteins, **creates a feeling of satiety.**

Along with diet , additional :five to six times of diet with addition to the ration between meals *"maxim"* national *beverage;* sufficient amount of water (calculation 30 ml per 1 kg of body weight); exclusion of semi-finished products (sausages,); Exclusion of alcoholic beverages, which weak self-control over food intake and are themselves a source of energy. Exclusion of appetizing foods and products: spices, strong broths and sauces.

2. Group exercises in gymnastics according to the author's scheme 3 times a week in the course for an hour.
3. Respiratory exercises "vacuum" with self-hypnosis.
4. Lymphatic-drainage by a trained technique on your own at night.

METHODS of study

1. Standard clinical and laboratory examination (complete blood test, urine analysis, determination of sugar, cholesterol, lipid profile, ECG, blood pressure monitoring).
2. Somatometric measurements (height, weight, body mass index calculation, waist circumference, hips, buttocks, shoulder).
3. Determination of skinfold thickness (ST) on the abdomen, chest, back, thigh and shoulder using an electronic digital caliper KEC-100, an error of 1 mm (Figure 1 a).
4. Defining the component composition of a body by means of bioimpedance analyzer ABC-01 "Medass" with definition of the following parameters: basal metabolism, BMI, body fat mass, fat-free mass, the active cell mass, skeletal muscular mass , a specific (normalized for

body surface area) of the main exchange, total body water, the volume of extracellular fluid, and the percentage of fat in the body.

The study was conducted twice before the start of the rehabilitation course and ends in a month. The processing of the results was carried out with the help of computer programs of variational statistics Excel and SPSS for parametric and nonparametric indices using the Student's test for parallel distribution. Differences between the compared values were considered statistically significant at a significance level of $p < 0.05$.

The results obtained and their discussion

The growth-weight and somatometric parameters in the control group were within the normal limit and were close to the data of other authors, given for healthy women of reproductive age [1, 11].

Women with metabolic syndrome differed significantly in terms of somatometric indicators from their same age group (Table 1).

Table 1 - Growth and somatometric parameters of females in control group and the main group before and after one month of rehabilitation (M ± m)

Groups	Height (cm)	Weight (kg)	BMI	Circumference of waist (cm)	Circumference of thigh (cm)	Subcutaneous fat on abdomen (mm)
Monitoring	160.76 ± 1.5	55.24 ± 2.4	21.35 ± 2.0	69.38 ± 2.5	92.94 ± 1.7	16.5 ± 1.6
Basic before treatment	158.53 ± 1.4	69.25 * ± 1.8	27,693 * ± 2.1	88.87 * ± 2.2	99.93 * ± 1.9	33, 2 * ± 1.5
After treatment,	158.53 ± 1.4	66.53 ± 1.7	26,467 ± 1.9	81.2 ** ± 2.2	97.87 ± 1.8	29.47 ** ± 1.4

Note: * - criteria difference with the control group $p < 0.05$;
** - criteria difference with baseline $p < 0.05$;

If the difference in growth was statistically insignificant, then the weight in the women of the main group exceeded by 25% the value in the control group. BMI in the main group was 29.7% higher. The circumference of the waist was 28.1% higher than that of women and the thigh circumference was 8.2% higher.

A special difference was revealed in the determination of Subcutaneous fat on abdomen is exceeded by 101%.

Changes in women's main group is not limited to appearance, three of them with increased blood pressure ,two with high levels of sugar, cholesterol and triglycerides in the blood, which is

considered typical for metabolic syndrome [2, 9] . The remaining indicators were close to the upper limit of the normal . The average values of these indicators are given in Table 2.

Table 2 - Arterial pressure and biochemical parameters in women of the control group and the main group before and after the monthly rehabilitation course (M ± m)

Groups	Sys.Blood pressure (mm of Hg)	Diastolic .Blood pressure (mm of Hg)	Blood Sugar (mmol /l)	Cholesterol (mmol / l)
Control	108.27 ± 3.2	72.22 ± 1.4	3, 4 5 ± 0.23	3.30 ± 0.19
Basic before treatment	121.4 * ± 3.3	75.3 ± 1.4	4.90 * ± 0.32	4.28 * ± 0, 21
After treatment	116.2 ± 2.8	72.4 ± 1.5	4.75 ± 0.23	3.80 ± 0.18

Note: * - criteria difference with the control group p <0.05;
** - criteria difference with baseline p <0.05;

The table shows that the average value of Systolic BP in women with metabolic syndrome was significantly higher than in the control group. Shifts of Diastolic BP are not statistically significant. Also, the average values of sugar and cholesterol in the main group were significantly higher than those in the control group.

Bioepidance analysis revealed significant differences in the body composition of the body in women of the main and control groups (Table 3).

Table 3 - Component composition of the body in women of the control group and the main group before and after the monthly rehabilitation course.

Groups	Fatty mass in kg	Fatty mass in %	lean weight kg	Skeletal muscular mass kg	Skeletal muscular mass in %
Control	15.1 ± 2.4	27.45 ± 2.2	39.97 ± 1.7	19, 6 ± 1.6	49.01 ± 2 , 0
Basic before treatment	24.6 * ± 2.2	35.41 * ± 2.4	44.44 ± 1.8	20,293 ± 1.4	45.6 1 ± 1.6
After treatment	21.8 ± 2.1	32.83 ± 2.2	44.49 ± 1. 7	20.62 ± 1.7	46.37 ± 1.5

Note: * - criteria difference with the control group p <0.05;
** - criteria difference with baseline p <0.05;

Significantly above the control level in women with metabolic syndrome was the fat mass, both in absolute weight and in percentage ratio (p <0.05).

The monthly course of rehabilitation led to a significant decrease in weight by an average of -2.86 ± 0.5 kg. The maximum weight loss is 6 kg, the minimum is 2 kg per month. In one case, a weight increase of 2 kg was also noted, but the woman did not follow the doctor's prescription.

More significant dynamics was noted from the waist circumference, which decreased by an average of 7.67 cm or 8.5% (Fig. 2) The circumference of the thighs did not decrease significantly, but the circumference of the buttocks in contrast increased by 1.3 cm. Women were satisfied with this result.

Using caliper electronic digital CEC - 100 allowed to record a significant decrease in the thickness of subcutaneous tissue on the abdomen on average by 3.8 mm. The maximum reduction is indicated by 9 mm. There was also a decrease in subcutaneous fat in other parts of the body.

Figure 2 - Appearance of the course participant before and after the month of classes

All participants in the rehabilitation course normalized their blood pressure, blood sugar, cholesterol and LDL.

Conclusion

The application of the described complex program of physical rehabilitation provides evidence-based instrumental and laboratory data on its effectiveness, which allows recommending a program to help obese patients and practically healthy individuals who want to lose weight and lives a long life.

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