

The effectiveness of the "Reflexology method for reducing excess body weight and figure correction (Mukhina M.M.) "in case of abdominal obesity

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One of the most pressing problems of modern medicine is obesity and its concomitant metabolic syndrome (MS), which includes the following components: abdominal (visceral) obesity, insulin resistance, impaired glucose tolerance and hyperinsulinemia, dyslipidemia, arterial hypertension, microalbuminuria, impaired hemostasis, early atherosclerosis [1, 2, 3, 5, 12, 13, 15, 19].

Today, there is an extremely high prevalence of MS, which increases with age and ranges from 14 to 24% depending on the population [14, 16, 33, 24]. At the same time, there is a tendency towards an increase in the number of patients with obesity and MS among adolescents and young people [21]. It is the development of MS in obese individuals that is associated with a high incidence of cardiovascular diseases, type II diabetes mellitus, as well as an increased risk of coronary complications and overall mortality in these patients [16, 17, 19, 20].

The pathophysiological disorders in MS are based on insulin resistance, the severity of which depends on the genetic characteristics of the organism, the conditions of intrauterine development and environmental influences [16, 21]... Environmental factors contributing to the occurrence of MS include high-calorie atherogenic nutrition, obesity and overweight (mT), stress, and bad habits [3]. Lack of physical activity contributes to the development of obesity and reduces the sensitivity of skeletal muscle to insulin.

It is now considered proven that tissue sensitivity to insulin decreases by more than 40% when the ideal weight is exceeded by 35–40% [1-3]. Insulin resistance also depends on the nature of the distribution of adipose tissue in the body. Thus, it is the visceral adipose tissue that plays an important role in the onset and progression of insulin resistance [1-3]. Adipocytes of visceral fat (as opposed to subcutaneous fat) have a lower density and sensitivity of insulin receptors [13, 18], which leads to their reduced sensitivity to endogenous insulin. Consequently, visceral adipose tissue has a significant effect on the regulation of carbohydrate metabolism, and its excessive accumulation contributes to the development of type II diabetes mellitus [3].

It has been shown that in men with age there is an increase in the relative content of intra-abdominal fat from 6–7% of its total amount at 20 years to 20% by 30–50 years and 30–35% by 60–80 years. In women, the mass fraction of visceral fat often increases after menopause [4, 12].

In addition, in recent years it has been reliably shown that an increase in blood pressure is also associated with an excess of adipose tissue, primarily visceral fat [1-3, 25].

Thus, the problem of abdominal obesity and insulin resistance is relevant in the light of the prevention and treatment of socially significant diseases. Reduction of excess mT and figure correction (the method of Mukhina M.M.) consists in the correction of excess mT with the use of auricular and corporal reflexology in combination with a reduction diet [6, 10]. The method was approved for medical use by the RF Ministry of Health in 2004 [6], its priority is confirmed by RF patents [7-11].

The purpose of this study was to study the dynamics of body mass and volume, and also the dynamics of abdominal (visceral) obesity when using the method

reflexology to reduce excess mT and figure correction (methods of Mukhina M.M.) in comparison with the use of dietary recommendations as monotherapy.

#### Materials and methods

The study group consisted of 30 people (29 women and 1 man) aged 19 to 71 years, the average age was  $44.2 \pm 2.4$  years. The study lasted 150 days.

In accordance with the research algorithm, all patients were divided into two groups: an experimental group (21 patients) and a control group (9 patients). The patients of the experimental group received acupuncture sessions according to the method of Mukhina M.M. and adhered to specially developed dietary recommendations aimed at reducing mT (group "IRT + diet"). Patients in the control group only followed the same dietary recommendations (Diet group).

As the main criterion for determining the presence and degree of obesity, as well as the dynamics of changes in mT the study used the body mass index (BMI) [6,21]. Normal BMI values range from 18.5 to 24.9 kg / m<sup>2</sup>; BMI values less than 18.5 kg / m<sup>2</sup> indicate a deficiency of mT, more than 25 kg / m<sup>2</sup> - about the excess of mT. BMI value from 30.0 to 34.9 kg / m<sup>2</sup> correspond to obesity of the I degree, 35.0-39.9 kg / m<sup>2</sup> - II degree obesity, more than 40.0 kg / m<sup>2</sup> - obesity III degree [22].

To determine the presence and severity of abdominal (visceral) obesity, we calculated the OT / OI index as the ratio of the waist circumference (OT) to the hip circumference (OI). For men, the normal values of the OT / OB index are less than 1.0; for women - less than 0.85 [2, 3].

#### Research progress and results

During the study, mT and BMI objectively decreased in 28 out of 30 patients. Patient distribution depending on mT at the beginning and end of the study is presented in Table 1.

Table 1

Distribution of patients depending on mT at the start and end research

m <sub>T</sub> пациентов	До начала исследования		После окончания исследования	
	Диета (n = 9)	ИРТ + диета (n = 21)	Диета (n = 9)	ИРТ + диета (n = 21)
Нормальная m <sub>T</sub>	0	1	0	8
Избыточная m <sub>T</sub>	1	12	4	8
Ожирение I ст.	4	4	3	2
Ожирение II ст.	3	2	1	2
Ожирение III ст.	1	2	1	1

At the end of the study, there was a significant ( $p < 0.05$ ) decrease in the mean values of mT from  $89.0 \pm 2.9$  kg to  $80.1 \pm 3.1$  kg and BMI from  $32.9 \pm 1.1$  to  $29.6 \pm 1.1$  kg / m<sup>2</sup> in all patients included in this study (Table 2).

table 2

Decrease in body weight and BMI in patients during the study

Показатели	Диета (n = 9)	ИРТ + диета (n = 21)	Все пациенты (n = 30)
$m_T$ на момент начала курса, кг	98,0 ± 3,9	85,1 ± 3,6	89,0 ± 2,9
$m_T$ на момент окончания курса, кг	91,3 ± 5,3	75,3 ± 3,3*	80,1 ± 3,1*
ИМТ на момент начала курса, кг/м <sup>2</sup>	35,2 ± 1,1	31,9 ± 1,4	32,9 ± 1,1
ИМТ на момент окончания курса, кг/м <sup>2</sup>	32,8 ± 1,6	28,3 ± 1,3*	29,6 ± 1,1*
Среднее снижение $m_T$ , в % от исходной	6,9 ± 2,8	11,4 ± 1,2	10,1 ± 1,2
Количество неудовлетворительных результатов	1	1	2

\* $p < 0,05$  по сравнению с исходными показателями

In the group "IRT + diet" average  $m_T$  patients significantly ( $p < 0.05$ ) decreased from 85.1 ± 3.6 kg to 75.3 ± 3.3 kg, BMI - from 31.9 ± 1.4 to 28.3 ± 1.3 kg / m<sup>2</sup>, decrease in  $m_T$  relative to the original was 11.4 ± 1.2%. While the average decline in  $m_T$  in the "Diet" group relative to the initial values was only 6.9 ± 2.8%, the average  $m_T$  patients of this group decreased from 98.0 ± 3.9 kg to 91.3 ± 5.3 kg, BMI - from 35.2 ± 1.1 to 32.8 ± 1.6 kg / m<sup>2</sup>...

When analyzing the dependence of the amount of body weight loss on the duration of the course in the "IRT + diet" group, it was found that significantly better results (average body weight loss 14.0 ± 2.2% relative to the initial values ( $p < 0.01$ )) were obtained in the group of patients who attended all 4 IRT sessions during the study. In patients who underwent a course of 2–3 IRT sessions, body weight loss was only 6.8 ± 3.2%.

There was no negative impact of the studied technique on patients with initially normal body weight; on the contrary, there was a decrease in the volume of problem areas.

During the study, there was a decrease in the OT / OB index in the group of 30 patients from 0.84 ± 0.01 to 0.82 ± 0.02, which indicates a decrease in the severity of visceral obesity in patients during the study (Table 3).

Table 3

Dynamics of the OT / OB index in patients during the study (n = 30)

Показатели	Диета (n = 9)	ИРТ + диета (n = 21)	Все пациенты (n = 30)
OT/OB до начала исследования	0,83 ± 0,01	0,84 ± 0,02	0,84 ± 0,01
OT/OB после окончания исследования	0,86 ± 0,03	0,81 ± 0,02	0,82 ± 0,02
Снижение OT/OB, в % от исходного	-3,2 ± 1,3*	2,5 ± 1,1*	0,38 ± 1,1

\*  $p < 0,05$

However, by group analysis in the "Diet" group, an increase in this index was recorded from 0.83 ± 0.01 to 0.86 ± 0.03, as a result of which the average percentage of decrease in OT / OB in this group had a negative value and amounted to - 3, 2 ± 1.3%. In the patients of the "IRT + diet" group, on the contrary, there was a tendency towards a decrease in visceral obesity and a decrease in the index from 0.84 ± 0.02 to 0.81 ± 0.02, while the percentage of decrease was significantly greater than in the group "Diet" and amounted to 2.5 ± 1.1% ( $p < 0.05$ ).

This fact indicates a positive effect of the investigated IRT technique on abdominal (visceral) obesity and, consequently, a decrease in the risk of diabetes mellitus and complications from the cardiovascular system [1-3]. Negative results in the form of an increase in  $m_T$  were recorded in 2 patients who deliberately did not follow dietary recommendations during the study.

conclusions

1. Conducted objectification of the results of the application of the method under study in the group

patients, consisting of 30 people (in accordance with the research algorithm).

2. It has been shown that the effectiveness of the method in relation to weight loss and reduction the severity of abdominal obesity is higher with the combined use of IRT and dietary recommendations as compared with the use of dietary recommendations alone.

3. Considering the results obtained in the present and previous studies, the reflexology method for reducing excess body weight and body shaping (Mukhina M.M.) is effective and safe and can be recommended for widespread use in practical health care.

4. If patients have contraindications to the use of reflexology, standardized by the Order of the Ministry of Health and Social Development of the Russian Federation dated April 13, 2007 No. 266, it is possible to achieve a decrease in body weight if specially developed by Mukhina M.M. dietary recommendations.

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The effectiveness of the "Reflexology method for reducing excess body weight and body shaping (Mukhina MM)" in abdominal obesity / MM. Mukhina, N.V. Chadaev, A.A. Karpeev, T.L. Kiseleva, M.A. Dronova // Traditional medicine. - 2007. - No. 3 (10). - S. 39-42.

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