Application of Special Algorithms of Diet Therapy for Metabolic Syndrome in Practice

Badritdinova Matlyuba Nazhmidinovna, Mehmonov Feruz Shamsievich

Bukhara State Medical Institute named after Abu Ali ibn Sino Department of Internal Medicine

Abstract: The selection of patients was carried out using a prospective method. A total of 110 patients were selected. The distribution of patients by gender was as follows: 60 men and 50 women were selected. During the examination, the following was determined: - blood glucose, blood pressure, cholesterol, triglycerides and β-lipoproteins, as well as the Kettle index. All patients were divided by age, gender and concomitant diseases - the patients were aged 20-80 years and did not receive glucose-lowering therapy. No positive changes were noted in 31 of 55 patients in the control group, i.e. in 56.4%. Adherence to a healthy lifestyle was noted in 24 patients in the control group, i.e. 43.6%. In 51 of 55 patients of the main group, that is, in 92.7%, the prevalence of MS components decreased when using a special algorithm of diet therapy with traditional preventive measures. In 4 patients, i.e. 7.3%, the change was not obvious, that is, these patients did not change their usual lifestyle, and the harmful effects of risk factors in these patients remained.

Keywords: overeating, physical inactivity, genetic predisposition, arterial hypertension, lifestyle.

Relevance Metabolic syndrome (MS) is characterized by an increase in visceral fat mass, a decrease in the sensitivity of peripheral tissues to insulin and hyperinsulinemia, which leads to impaired carbohydrate, lipid, purine metabolism and arterial hypertension (AH) [1,3,10]. The problem of MS progression is one of the most pressing problems of modern medicine and is associated not only with an unhealthy lifestyle, overeating and physical inactivity, but also with genetic predisposition. The problem of MS development is directly related to lifestyle and poor diet [2,4,6]. National cuisines were replaced by high-calorie diets: widespread "McDonaldization" and "Coca-Colanization." In large industrial cities, the majority of the working age population, when choosing a place to eat, prefers a variety of fast food cafes, where they are often offered foods high in fat, carbohydrates, salt, sugar, low in fiber and rich in vitamins and minerals. Thus, lifestyle changes and dietary therapy remain the main treatment strategies for multiple sclerosis.

Purpose of the study: Application of special diet therapy algorithms for metabolic syndrome.

Material and methods The selection of patients was carried out using a probabilistic method. A total of 110 patients were selected. The distribution of patients by gender was as follows: 60 men and 50 women were selected. The examination determined: - blood glucose, blood pressure, cholesterol, triglycerides and β-lipoproteins, as well as the Quetelet index. All patients were divided by age, gender and concomitant diseases - the age of patients was 20-80 years, and they had not previously undergone glucose-lowering therapy (Table 1).

Table 1 Distribution of patients by gender and age

Group	Age		General
	20-80 years men	20-80 years women	
I	30	25	55
II	30	25	55
General	60 (54,5%)	50 (45,5%)	110

Research results. The dynamics of average levels of risk factors was studied. Analysis of risk factors revealed different dynamics of these indicators (Table 2). In addition to the increase in blood pressure (BP), there was a decrease in glycemia at lunch and 2 hours after the glucose load, as well as a decrease in glycemia 1 hour after the glucose load. It is worth noting that the average SBP and DBP values increased significantly. However, there were no significant differences between the rate of increase in DBP and the rate of increase in SBP. There was a slight increase in postprandial glycemia and a decrease in KI values, but the differences detected were not statistically significant. After 2 hours of glucose loading, an increase in glycemia was observed by 14.42 mg%, and 1 hour after glucose loading, a decrease of 17.52 mg% was observed. It was shown above that the prevalence of TVI has decreased significantly. However, it did not show a significant decrease in the level of the Kettle index. In order to find out the reasons for this fact, the dynamics of the level of CI in groups with normal and increased body weight was studied. It was found that with an increase in body weight, the average IC level decreased from 0.259 to 0.041 (r < 0.05).

Table 2 Mean arterial pressure, Quetelet index and glycemic dynamics

date / Degree	n=110	
	M	± δ
SAH	91,63	18,37
DAH	77,13	32,87
Ketle index	0,259	0,041
Glycemia (fasting)	83,28	26,72
1 hours later	66.86	43,14
2 hours later	78,04	31,96
Cholesterol	77,14	32,86
Triglycerides	82,36	27,64
β-lipoprotein	85,51	24,49

The dynamics of mean lipid levels generally correspond to the dynamics of hyperlipidemia. Along with an increase in mean values of triglycerides and B-lipoproteins, a decrease in mean cholesterol values was observed. The findings show that as the population ages, levels of hypertension and blood pressure increase. At the same time, an increase in systolic and diastolic blood pressure was observed. The prevalence of hyperglycemic conditions increases with age. Along with an increase in the incidence of diabetes and a violation of the vagoinsular phase of the glycemic curve, a decrease in the sympathoadrenal phase of the glycemic curve was observed. The decrease in the prevalence of TBO with age does not fully reflect changes in the height and weight characteristics of the population. Therefore, it is advisable to study the dynamics of the height-weight index separately in groups of normal and increased body weight. The increase in the frequency and level of CO with age indicates the need for targeted active identification of these CO for timely adoption of preventive measures [7,8,9]. An increase in various quantitative combinations of the considered chemical substances occurs in each subsequent age group. At the same time, an increase in the combination of CO is more often

observed among the age groups 30-39 and 40-49 years. Later, with age, with an increase in the frequency of CO combinations, this is no longer so noticeable. It is noteworthy that not a single case of MS was observed in the age group of 20-29 years. With increasing age, with a decrease in the number of unstudied chemical agents (which is understandable), only one or - this factor decreases. Thus, this confirms the existence of a certain connection between age and the presence of CO, their number and combinations [7,8,10]. Кроме того, была изучена корреляция между ХО (табл. 3). Согласно полученным данным, между отдельными ХО имеется неясная связь. Оказалось, что в целом уровень почти всех коэффициентов достоверен (за исключением коэффициентов корреляции индекса Кеттла с холестерином и В-липопротеинами).

Table 3 Correlation coefficients between blood pressure, Quetelet index and glycemic parameters

	SAH	DAH	Ketle index	CH	TG	β-lip	On an empty stomach	1 hours later
DAH	0,77 *	-						
Ketle index	0,35**	0,45 *						
CH	0,1 *	0,03	0,01					
TG	0,2 *	0,09	0,11 *	0,45 *				
β-lip	0,12 *	0,06	0,08	0,61 *	0,34*			
Glycemia								
On an empty stomach	0,13 *	0,12 *	0,21 *	0,2 *	0,35*	0,18 *		
1 hours later	0,18 *	0,14 *	0,22 *	0,05	0,22*	0,1 *	0,41 *	
2 hours later	0,25 *	0,21 *	0,29 *	0,16 *	0,52*	0,11 *	0,43 *	0,42 *

Thus, the prevalence of the MS components under consideration in the study population is quite high, and the prevalence of MS and its components increases with age. The most intensive growth of MS and its components is observed after 40 years, while the dynamics of the distribution of individual MS components is unclear. In addition to cholesterol and B-lipoprotein levels, there is a correlation between the studied COs and body weight indicators.

From a medical point of view, it is advisable to eat 4 times a day and every day at the same time. Following this order creates the opportunity for good digestion of nutrients. Increasing the quantity and number of meals reduces the excitability of the digestive center and suppresses appetite. With four meals a day, the first breakfast should be about 600-700 kcal, the second breakfast 300-400 kcal, lunch 900-1000 kcal, and dinner 600-700 kcal. The number of calories consumed by people over 50 years of age should not exceed 2500-2600, and the amount of fat and sugar should be strictly limited.

Recommended diet for metabolic syndrome (as an example)

Breakfast: oatmeal, egg white omelet, tea.
Second breakfast: Cottage cheese with sour cream.
Lunch: Weak lean vegetable soup, mashed potatoes.
with boiled chicken, tea with lemon
Second lunch: Stewed apples.
Dinner: Mashed potatoes.

Establishing the correct diet:

Prevention of weight gain, normalization of excess body weight.

It is necessary to consume foods containing potassium and magnesium (raisins, apricot peel).

Regular consumption of foods rich in proteins and amino acids (cottage cheese, meat, fish).

Eating enough vegetables and fruits while maintaining a sufficient balance (eggplant, beans, dairy products).

Unsaturated fatty acids in oils (vegetable oils).

Don't increase your salt intake by 4-5 grams per day.

Liquid consumption should not exceed 1.5 liters.

Exclusion of spicy foods, salty, fatty, flour and confectionery products.

Limit fatty meats, various fatty foods or oils.

Products approved for diabetics are also beneficial for healthy people.

Exclusion from the diet of alcohol, juices, lemonades.

Reducing the amount of sweets and cream when drinking tea and coffee.

Choose sugar-free products.

Replace sweets with healthy foods, such as eating banana dessert instead of ice cream.

Diet for 7 days for metabolic syndrome

First stage

The first stage is active fat burning. This usually lasts up to 2 weeks. A very strict menu severely limits carbohydrates, so starting a diet is difficult, but effective. At the first stage, you are allowed to eat only foods with 0 points, that is, without carbohydrates. Protein, that is, milk, meat, and vegetables predominate.

Second phase

The second stage is normalization. During this period, weight loss processes stabilize, the body gradually gets used to the new regime. Weight loss will be slower but more sustainable. The stage lasts from two weeks to several months.

Day 1

Breakfast: mashed potatoes and mushrooms.

Lunch: boiled dietary beef, vegetable salad.

Dinner: boiled fish, seaweed salad.

Day 2

Breakfast: Omelet with green beans.

Lunch: carrot and pea salad, lean beef.

 Dinner: low-fat cottage cheese.

Day 3

Breakfast: cheesecakes, a glass of milk.

Lunch: vegetable soup of beans, tomatoes and peppers.

Dinner: boiled fish, seaweed salad.

Day 4

Breakfast: two-egg omelette with milk.

Lunch: white lean fish soup.

Dinner: boiled chicken breast, green peas.

Day 5

Breakfast: low-fat cottage cheese.

Lunch: Roast turkey, steamed broccoli.

Dinner: bran bread, a glass of skim milk, an egg.

Day 6

Breakfast: two-egg omelette with milk.

Lunch: tomato, bell pepper and cucumber, boiled fish.

Dinner: vegetable soup with tomatoes, a couple of cucumbers.

Day 7

Breakfast: whole grain bread, a glass of skim milk, an egg.

Lunch: boiled chicken breast, green peas.

Dinner: creamy milk soup with mushrooms.

Advice

Meals are at least five times a day, and between main meals you can eat dairy products and vegetables.

Second phase

The second stage is normalization. During this period, weight loss processes stabilize, the body gradually gets used to the new regime. Weight loss will be slower but more sustainable. The stage lasts from two weeks to several months.

Main meals must have certain points: breakfast - 4 points, lunch - 2, dinner - 0. Lunch can have 2 points, and dinner - only 1.

55 patients of the first group (control group) had risk factors for the development of metabolic syndrome and received traditional preventive measures.

The second group (main) also consisted of 55 patients in whom a special diet therapy algorithm was used with traditional preventive measures and dynamic observation was carried out.

No positive changes were noted in 31 of 55 patients in the control group, i.e. in 56.4%. Adherence to a healthy lifestyle was noted in 24 patients in the control group, i.e. 43.6%.

In 51 of 55 patients of the main group, that is, in 92.7%, the prevalence of MS components decreased when using a special algorithm of diet therapy with traditional preventive measures. In 4 patients, i.e. 7.3%, the change was not obvious, that is, these patients did not change their usual lifestyle and they continued to have the harmful effects of risk factors.

Summary

1. No positive changes were noted in 31 patients out of 55 in the control group, i.e. 56.4%. Adherence to a healthy lifestyle was noted in 24 patients in the control group, i.e. 43.6%.

2. In 51 out of 55 patients of the main group, that is, in 92.7%, the prevalence of MS components decreased when using a special diet therapy algorithm with traditional preventive measures.

3. In 4 patients, i.e. 7.3%, the change is not obvious, i.e. these patients did not change their usual lifestyle, and the harmful effects of risk factors in these patients remained.

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