

THE VALUE OF BODY MASS INDEX IN THE DEVELOPMENT OF METABOLIC SYNDROME

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Abstract: at the beginning of the third Millennium, the problem of cardiovascular diseases (CVD) came to the forefront among all causes of morbidity and mortality for humanity, which has overcome the epidemic of life-threatening infections over the centuries. A significant role in this was played by lifestyle modification associated with the restriction of physical activity, increased caloric content of food and a steady increase in emotional and stress loads. All of this potentiates the main risk factors for CVD, which are "negative assets of progress", namely increased blood pressure (BP), dyslipidemia, diabetes mellitus (DM) and obesity. Since 1988, after G. Reaven's Bunting lecture, the interrelated combination of these pathologies is usually denoted by a single term "metabolic syndrome X".

Keywords: metabolic syndrome, hypertension, adipose tissue, obesity, retinopathy, gout, insulin resistance.

ЗНАЧЕНИЕ ИНДЕКСА МАССЫ ТЕЛА В РАЗВИТИИ МЕТАБОЛИЧЕСКОГО СИНДРОМА

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Аннотация: в начале третьего тысячелетия для человечества, преодолевшего на протяжении многовековой истории эпидемии опасных для жизни инфекций, на первое место по актуальности среди всех причин заболеваемости и смертности вышла проблема сердечнососудистых заболеваний (ССЗ). Существенную роль в этом сыграла модификация образа жизни, связанная с ограничением физической активности, увеличением калорийности пищевых продуктов и неуклонным ростом эмоционально-стрессовых нагрузок. Все это потенцирует основные факторы риска возникновения ССЗ, которые являются «отрицательным достоянием прогресса», а именно повышение артериального давления (АД), дислипидемия, сахарный диабет (СД) и ожирение. С 1988 г., после Бантинговской лекции G. Reaven, взаимосвязанное сочетание указанных патологий принято обозначать единым термином «метаболический синдром Х».

Ключевые слова: метаболический синдром, артериальная гипертензия, жировая ткань, ожирение, ретинопатия, подагра, инсулинорезистентности.

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Metabolic syndrome – the general condition of the human body, it is combining a group of symptoms and risk factors, which subsequently lead to the development of heart disease, stroke, diabetes, gout and malignant processes of the genital organs. It is a complex of metabolic, metabolic, hormonal and clinical disorders [1].

Professor G. Reaven in his Bunting lecture in 1988 on the basis of his own observations and generalization of studies by other authors put forward the hypothesis that insulin resistance, abdominal obesity, hypertension (AH), atherogenic dyslipidemia and coronary heart disease (CHD) are a manifestation of a pathological condition, which he proposed to call "syndrome X". In 1989, D. Kaplan coined the term "Lethal Quartet": a combination of diabetes, obesity, hypertension and coronary heart disease [2].

"Regardless of the classification options of the metabolic syndrome, visceral obesity is consistently included in the list of definitions. This type of obesity on the principle of dominoes entails various metabolic disorders. Adipose tissue is a huge endocrine organ, a source of diabetogenic, atherogenic and proinflammatory biologically active substances (adipokines). According to the figurative expression of Professor A. M. Mirtumyan, metabolic syndrome is a "metabolic nightmare", the consequence of which are pathological changes in all tissues and systems of the body. The risk of many diseases, including cardiovascular disease, diabetes mellitus is increasing; in addition, in recent years, the relationship between obesity and mortality from almost all forms of cancer has been convincingly confirmed» [3].

Screening primary detection of metabolic syndrome - chance to avoid diseases, such as diabetes, atherosclerosis and hypertension, infertility in childbearing age, genital cancer and etc [4].

Material and methods of research. The study involved 38 women with obesity of different types of complexity. Of these, 13 women were 1st degree obese, 16—2nd degree obese and 9—3rd degree obese women. In the study of blood pressure, lipid spectrum of blood and fasting glucose - the corresponding metabolic syndrome changes were observed in 21 women, and these women were observed all 3 degrees of obesity in almost equal values.

Sometimes MS can be diagnosed even with a small increase in body weight in the aggregate of other symptoms. It also makes sense to consult a doctor for the detection of MS in angina pectoris (periodic heart pain), with erection disorders in men and polycystic ovary syndrome in women, with gout and increased uric acid content in the blood. To date, there are several methods or criteria for the diagnosis of metabolic syndrome.

Results and discussion. In metabolic syndrome there are pathological changes in all tissues and systems of the body. It is characterized by visceral (internal) obesity. This type of obesity in a Domino effect leads to various metabolic disturbances. Adipose tissue is a huge endocrine organ, a source of biologically active substances that contribute to the development of diabetes, atherosclerosis and provoke inflammation. In this case, obesity can be insignificant. Despite the fact that the body mass index is changed at the level of 1, 2 degrees of obesity, in cases of obesity at a younger age, the metabolic syndrome has already been observed in the test group of women.

Metabolic disorders are most common in those people who eat fast food, snack on the go sandwiches and hot dogs, are subjected to stress and nervous overload, lead a sedentary lifestyle. Violation of metabolic processes often occurs also in women during menopause.

The prevalence of this metabolic disorder in civilized countries has now assumed the scope of the epidemic. In addition to these diseases, the metabolic syndrome threatens the development of gout, fatty liver degeneration, polycystic ovaries, erectile dysfunction, and in the future – the emergence of such serious diseases as liver cirrhosis, thrombosis, myocardial infarction, cerebral vascular stroke, diabetic retinopathy (blindness).

We should understand that this state is reversible. Of course, first of all we must try to lose weight. 5-10 percent weight loss leads to a 20 percent reduction in the level of "bad" cholesterol and a noticeable decrease in the average daily blood pressure.

With proper treatment, you can reduce the severity of the metabolic syndrome. And the main effort should be directed to the waste of calories naturally.

One of the main signs of metabolic syndrome – the main criterion is the presence of excess fat in the waist. Volumes of more than 80 centimeters in women and 94 centimeters in men in the waist area — reason to assess the presence of additional risk factors, including hypertension (blood pressure more than 140/90 mm of mercury), insulin resistance and other.

Additional criterion:

- Arterial hypertension (BP >140/90 mm Hg. art.)
- Increasing levels of TG >1.7 mmol/l
- Reduction of HDL cholesterol <1.0 mmol/l in men; <1.2 mmol/l in women
- Increase in LDL cholesterol >3.0 mmol/l
- Fasting hyperglycemia (fasting plasma glucose > 6.1 mmol/l)
- Impaired glucose tolerance — glucose in plasma 2 hours after glucose tolerance test within >7.8 and <11.1 mmol/l.

One main and two additional criteria confirm the diagnosis of MS.

Violation of insulin absorption entails excessive hormone production in the pancreas and, as a consequence, its dysfunction; this, in turn, leads to an increase in blood sugar levels up to the development of diabetes. In addition to insulin resistance, obesity plays an important role in the development of metabolic syndrome and

diabetes. Visceral (internal) fat cells in the abdomen produce and secrete harmful substances – inflammatory mediators, free fatty acids and oxidation products.

Getting into the bloodstream, these substances cause a number of changes that lead to metabolic syndrome. They are able to provoke an increase in blood pressure, damage the walls of blood vessels and stimulate the development of atherosclerosis, disrupt insulin activity, accumulate in the liver (which leads to fat dystrophy, up to liver failure), weaken heart function.

There are other complications: lipid metabolism, women – the development of polycystic ovary syndrome (menstrual cycle, increased hairiness and acne).

Adipocyte — cell, which is the main part of adipose tissue. Adipocytes participate in fat metabolism, have the ability to accumulate fats, which are further used by the body to generate energy.

Adipose tissue — kind of connective tissue of animal organisms, formed from the mesenchyma. The specific function is the accumulation and exchange of fat. Almost the entire fat cell is filled with fat drop, surrounded by the rim of the cytoplasm with the cell nucleus pushed to the periphery.

MRI allowed to study the topography of adipose tissue in the abdominal area and divide it into visceral and subcutaneous, as well as white and brown adipose tissue.

White adipose tissue is located in the subcutaneous fat, omentum, retroperitoneal space. In adipocytes of the white color synthesized neutral fats. Brown adipose tissue is located along the aorta, large vessels, internal organs, and is the basis of abdominal obesity. Adipocytes of brown color small size contains many cytochrome, they are inherent in neuroendocrine function.

Conclusion.

Visceral adipose tissue plays an important role in the development and progression of insulin resistance. Intensive lipolysis leads to the release of large amounts of free fatty acids (FFA), mainly – in the portal circulation and in the liver. In the liver, FFA prevents insulin binding with hepatocytes, causing the development of insulin resistance at the liver level, reducing insulin extraction by the liver and the development of systemic hyperinsulinemia.

In addition, the development of metabolic syndrome is observed in cases where a woman began to gain weight at a younger age, while even with a slight weight gain, a metabolic syndrome can be observed.

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