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FEATURES OF CARDIAC ARRHYTHMIAS IN HUMANS WITH METABOLIC SYNDROME

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✓ ***Resume***

The current concepts are given on metabolic syndrome, criteria of its diagnosis, peculiarities of medical treatment of different components of the metabolic syndrome, as well as the data on its influence on the incidence of cardiac arrhythmias.

Key words: metabolic syndrome, arterial hypertension, diabetes mellitus, insulin resistance, obesity, cardiac arrhythmias, atrial fibrillation.

ОСОБЕННОСТИ НАРУШЕНИЯ РИТМА СЕРДЦА У ЛИЦ С МЕТАБОЛИЧЕСКИМ СИНДРОМОМ

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✓ ***Резюме***

Излагаются современные представления о метаболическом синдроме, критериях, используемых при постановке данного диагноза, а также сведения о его влиянии на частоту возникновения нарушений ритма сердца

Ключевые слова: метаболический синдром, артериальная гипертензия, сахарный диабет, инсулинорезистентность, ожирение, нарушения ритма сердца, фибрилляция предсердий

МЕТАБОЛИК СИНДРОМИ БОР БЎЛГАН ШАХСЛАРДА ЮРАК РИТМИ БУЗИЛИШИНИНГ ХУСУСИЯТЛАРИ

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✓ ***Резюме***

Метаболик синдромнинг замонавий диагностикаси, ушбу ташхисни ўтказишда қўлланилган меъзонлар, шунингдек, юрак ритмининг бузилиши билан боғлиқлиги ҳақида маълумот беради

Калит сўзлар: метаболик синдром, артериал гипертензия, қандли диабет, инсулинорезистентлик, семириш, юрак ритмининг бузилиши, бўлмачалар фибрилляцияси.

Relevance

Metabolic syndrome (MS) is a complex of interrelated and modifiable risk factors for the development of cardiovascular diseases (CVD) and type 2 diabetes mellitus (DM) (as defined by the World Health Organization (WHO, 1999) and NCEP ATP III (2001) - National Cholesterol Education Program Adult Treatment Panel III - US National Educational Program on Cholesterol Reduction, revision III on therapy in adults) [1]. The main components of MS are disorders of carbohydrate metabolism, abdominal obesity, dyslipidemia, and arterial hypertension.

Against the background of abdominal obesity, which is one of the criteria for MS, a wide variety of neurohumoral disorders are

observed, which in turn can lead to cardiac arrhythmias. Obesity without the presence of additional MS criteria is accompanied by a shift in the balance of the autonomic nervous system towards the relative predominance of the sympathetic section due to a decrease in the parasympathetic and the development of diastolic dysfunction of the left ventricular myocardium, namely, diastolic dysfunction is the pathogenetic basis for the development of cardiac arrhythmias.

There is a large number of publications indicating that MS is a factor predisposing to atrial fibrillation (AF), a favorable background for the implementation of risk factors for AF [2].

Purpose of the research: To study the features of disorders of the heart rhythm in persons with metabolic syndrome.

Material and methods

Research K. Umetanietal., 2015 [3]. The author examined 592 patients without obvious structural changes in the heart. Of these, 32 (5%), MS 127 (21%) suffered from paroxysms of AF-atrial flutter. At the same time, paroxysms of AF-atrial flutter were detected in 12 (9%) patients with MS and in 20 (4%) - without MS. Multivariate regression analysis showed that MS is a significant risk factor for paroxysmal AF-atrial flutter, unrelated to the size of the left atrium (> 44 mm) or age (> 70 years). Of the 5 components, MS according to the well-known ATP-III (Adult Treatment Panel-III) scale correlated with a high degree of reliability with the risk of paroxysms of AF-atrial flutter body mass index (BMI)> 25 kg / m2. Thus, according to the authors, the high risk of AF-atrial flutter in MS may be based on alimentary obesity.H.Watanabeetal., 2014 [4] conducted a large study, which included 28449 patients, including 3716 (13%) with MS on the ATP-III scale, who did not have AF at baseline. During the follow-up period (average 4.5 years), AF was registered in 265 people, and the risk of AF in MS was significantly higher. All components of MS contributed to this increased risk with the exception of elevated triglyceride levels. The work of N. Echahidietal., 2016 [5] is very interesting and large-scale, in which a large team of authors assesses the risk factors for AF after coronary artery bypass grafting. The authors point out that AF is a very common complication after heart surgery, significantly affecting the prognosis. They note that previous studies have already shown that obesity is a risk factor after surgery. They retrospectively analyzed the relationship between obesity and MS on the one hand and paraxysmal AF on the other in 5085 patients after coronary artery bypass grafting. 1468 (29%) were obese (BMI> 30 kg / m2), 2320 (46%) had MS according to the ATP-III criteria. Paroxysmal AF occurred in 1374 (27%) patients. In obesity, AF paroxysms occurred significantly more often only in patients over 50 years of age. However, MS in the absence of obesity also turned out to be an independent significant risk factor for the development of AF (12% versus 6%), regardless of age.

Another tool for assessing the risk of fatal ventricular arrhythmias is the analysis of heart rate variability, which reflects the state of the autonomic nervous system. It is known that it is the autonomic nervous system that plays an important role in the initiation of malignant ventricular arrhythmias [6]. The probability of their occurrence is usually associated with an increase in the tone of the sympathetic and a decrease in the tone of the parasympathetic nervous system [7]. In the work of S.K. Parketal., 2014 [8], 423 elderly men were examined (NormativeAgingStudy), of which 32% were diagnosed with MS.

Thus, there is reason to believe that the presence of MS increases the risk of AF and life-threatening ventricular arrhythmias in patients. On the other hand, MS is clearly not one of the diseases that lie in the field of vision of those cardiologists who are specifically engaged in the diagnosis and treatment of cardiac arrhythmias. Information about the pathogenesis of MS is directly related to the pathogenesis of arrhythmias in this disease, and the principles of MS treatment are related to the primary prevention of cardiac arrhythmias.

In April 2012, a new edition of the European guidelines for the management of patients with hypertension was published [9]. One of the innovations of this version was that MS was included in the table of stratification of the risk of cardiovascular complications in patients with hypertension as a separate item: along with multiple risk factors, preclinical (for example, left ventricular hypertrophy, microalbuminuria, thickening of the intima-media complex or atherosclerotic plaque in the system of carotid arteries) manifestations of lesions of target organs and diabetes are a condition, according

to our European colleagues, it determines a moderate additional risk of cardiovascular complications even at a normal (120-129 / 80-84 mm Hg) level of blood pressure (BP), a high additional risk in the range from high normal BP (130-139 / 85-89 mm Hg) to AH II degree (160-179 / 100 -109 mm Hg) and very high - with AH III degree (BP more than 180/100 mm Hg.). according to our European colleagues, it determines a moderate additional risk of cardiovascular complications even at a normal (120-129 / 80-84 mm Hg) level of blood pressure (BP), a high additional risk in the range from high normal BP (130-139 / 85-89 mm Hg) to AH II degree (160-179 / 100 -109 mm Hg) and very high - with AH III degree (BP more than 180/100 mm Hg.). Does this mean that MS should become a part of the diagnostic formula in patients with hypertension? Of course not. And the point, first of all, is that until now there is no single definition of this state.

Almost all of the proposed definitions feature high values of waist volume (WT) as a marker of abdominal obesity, possibly associated with tissue resistance to insulin, disorders of lipid and carbohydrate metabolism, and AH. But, for example, the main criteria for the presence of MS, as defined by the American Association of Clinical Endocrinologists (2002), also included violations of purine metabolism, and additional criteria also list IHD, microalbuminuria, endothelial dysfunction, coagulation disorders, polycystic ovaries. Other definitions provide markers of inflammation, primarily C-reactive protein, non-alcoholic steatohepatosis, hepatocyte dysfunction, as well as any manifestations of atherosclerosis that can lead to an increase in cardiovascular morbidity and mortality [10]. Tightening of the criteria for abdominal obesity (OT for men is not 102, but 94 cm, and for women, not 88, but 80 cm) and the concept of "impaired carbohydrate metabolism" (natal glucose level is not 6.0, but 5, 6mmol / l) in the definition of the International Federation of Diabetologists (2005) significantly expands the range of "suspected" in the presence of MS. However, there is no evidence that such a tightening is caused by a further increase in cardiovascular morbidity and / or mortality within the limits of the proposed changes. A more rational approach seems to be an approach in which "threshold", that is, increasing the negative prognostic value, OT values are determined depending on BMI: 87 (m) / 79 (g) cm at normal body weight, 98 (m) / 92 (f) cm - with excess, 109 (m) / 103 (f) cm with obesity of the I degree, 124 (m) / 115 (f) cm - with high obesity [11]. When using the WHO criteria [12], the prevalence of MS among the US adult population was 25.1%, and when using the ATP-III criteria [13] - 23.3%: seemingly very similar numbers, but by 15-20% these are different groups of people. In addition, in Mexicans, MS is more often detected when using the WHO criteria, and in Mexicans, when using the ATPIII criteria. In the inhabitants of Southeast Asia, insulin resistance against the background of hypertension and lipid metabolism disorders is often detected with a less pronounced increase in OT (94-101 cm for men and 80-87 cm for women) than in Europeans.

In other words, when using different definitions depending on ethnicity and gender, the frequency of MS can vary within 24%. But, regardless of the criteria applied, the results of all studies indicate the adverse effects of "concentration" in one patient of one or another combination of cardiometabolic risk factors. H.M. Lakkaetal., 2017 [14], using either the ATPIII criteria or the WHO criteria, a group of 1209 middle-aged men was identified and followed for eleven years; the presence of MS, established in accordance with any of the criteria used, increased the relative risk of death from cardiovascular causes by 2.5-4 times. In addition, according to the calculated data in the population of sixty-year-olds, the prevalence of MS can reach 40% [15]. It is not surprising that, from the point of view of WHO experts, MS is one of the ten most dangerous diseases of modern mankind [16].

Until now, there is no single treatment strategy for MS. The presence in patients of a wide variety of non-modifiable risk factors (gender, heredity, age, ethnicity) in combination with modifiable factors (overweight or abdominal obesity, a sedentary lifestyle, arterial hypertension, dyslipidemia, impaired glucose tolerance and / or impaired fasting glycemia) determines the existence of a huge number of phenotypic variants of MS, requiring a personalized approach to the selection of therapy for its individual components. In this regard, the application of the concept of MS, according to WHO experts, is limited as a diagnostic and therapeutic tool [17]. Moreover, in the fall of 2013, Russian recommendations

were published, completely devoted to the diagnosis and treatment of MS. This document contains another version of the criteria for detecting MS [18].

The inclusion of MS in the criteria for stratification of the risk of cardiovascular complications in patients with hypertension naturally suggests its influence on the choice of therapeutic tactics. So, if signs of MS are detected in a person with normal blood pressure, then maximum efforts should be made to correct his lifestyle. At high normal BP values, in addition to non-drug measures, the evidence of antihypertensive therapy should be considered; AH of I and II degrees is an unconditional indication for the appointment, following the correction of lifestyle, drugs that normalize blood pressure; with grade III hypertension, drug recommendations may precede the development of a program of non-drug effects.

The appearance of a patient with MS is often an illustration of a disregard for a healthy lifestyle. Meanwhile, it is in patients with signs of MS that lifestyle correction can be especially effective. Weight management is key in the non-drug program in this patient population, as weight loss to normal levels significantly reduces their risk of developing diabetes. Moreover, it is known that a decrease in the total body weight by 10% provides a decrease in the mass of visceral fat by about 30%. Meanwhile, it has now been proven that visceral fat is not an inert store of energy, but a real endocrine organ [19], producing about 20 biologically active substances, expressing a number of receptors capable of responding to various neurohumoral signals. As a result, this "organ" is in constant metabolic interaction with other organs and systems, influencing eating behavior, carbohydrate and lipid metabolism, performing neurohumoral and immune functions.

Given the traditionally skeptical attitude of patients towards non-drug treatments, it is advisable to avoid “restrictive” dietary recommendations. It should be, first of all, that it is useful to have the most varied diet possible, including all the variety of fresh and cooked vegetables and fruits, whole grain breads now available, fatty sea fish and seafood, full-fledged meat, cereals and ma ¬Caronny products from durum wheat. Although, of course, it is impossible to do without explanations of the restrictions (seafood, but not shrimp; if meat, then beef, white poultry meat without skin; fats are limited, and 2/3 are vegetable; if possible, not canned food, not sausages, not black bread - too much salt). It is difficult to overestimate the role of adequate physical activity both in achieving normalization of body weight and in improving the overall prognosis of patients.

An impressive illustration of this is the results of NurseHealthStudy (2013): with the same BMI, mortality in the groups with moderate and high physical activity was significantly lower than with low physical activity [20]. It is clear that for someone the most acceptable will be "natural" physical activity at work (refusal to take the elevator in favor of walking up the stairs, 5-7 km of walking to work and / or home, etc.), who prefers to work out in the gym or in the swimming pool. In some cases, even an integrated approach does not provide the necessary weight loss. The only drug today that can effectively and safely influence this process from the point of view of the cardiovascular system is Xenical - a selective inhibitor of gastrointestinal lipases.

However, the European guidelines for the management of patients with hypertension in 2007 specifically emphasize that, first of all, drugs should be used that do not increase the risk of developing new cases of diabetes. This is due to the fact that an assessment of the dynamics of the spread of diabetes around the world allows us to talk about a real epidemic of this disease: if the current trend continues, then by 2012 there will be about 221 million patients with diabetes on Earth, and by 2030 - 360 million [21].

In accordance with the versatility of MS, therapy for this condition can only be complex, multicomponent. At different stages, different manifestations of MS may come to the fore in different people. Therefore, when treating these patients, it is advisable to prescribe, first of all, therapy aimed at correcting the currently leading symptom (be it hypertension, dyslipidemia or hyperglycemia), and within the framework of the chosen direction, the characteristics of a particular patient should be taken into account.

Scott Grundy, who chaired the third panel of experts for NCEP in 2014, in his article, Drug Therapy for MS. Minimizing the crisis of polypharmacy "reflects the general strategy of treatment for this disorder:

- Strengthening lifestyle change interventions to minimize the problems associated with polypharmacy;
- delay the initiation of drug therapy as much as possible (without worsening long-term clinical outcomes; exceptions are possible - these are drugs to lower low-density lipoprotein (LDL) cholesterol and blood pressure in individuals with an increase in the corresponding parameters);
- use as low doses of drugs as possible, consider early initiation of low-dose drugs for high LDL cholesterol levels and high blood pressure;
- using the smallest number of drugs to correct each risk factor: combining drugs in one dosage form, increasing the effectiveness of drugs without increasing toxicity, developing multifunctional drugs;
- increasing the degree of adherence to the regimen of taking drugs by simplifying the regimens of therapy;
- improved understanding of the variability of drug efficacy (eg, pharmacogenomics) [22].

The drugs of choice for correcting the lipid spectrum are currently statins - due to their lipid-lowering and multiple pleotropic effects, in particular, the ability to reduce the level of the pro-inflammatory marker of atherosclerosis progression - C-reactive protein. Since disorders of the lipid spectrum in MS are characterized primarily by severe hypertriglyceridemia, it is reasonable to use in these patients the most widely used drug now - atorvastatin, or rosuvostatin, which is gaining strength [23]. True, this recommendation is not indisputable - in the document it is classified as class IIb (benefit is not fully proven), level of evidence B (data obtained in one randomized or several non-randomized trials).

The drug of first choice for controlling glycemia in MS, at least in overweight patients with diabetes, is metformin. It was assumed that the above positive properties would make metformin useful already at the stage of NTG. However, when directly comparing the effectiveness of only non-drug measures and only the use of metformin, it turned out that in order to prevent one new case of diabetes, half the number of patients should be treated non-drug than with metformin. Moreover, while adhering to non-drug recommendations and taking metformin, the result did not improve [24].

Taking into account the negative prognostic value, it is advisable to include aspirin in the complex drug therapy of most patients with signs of MS, and even more so in the presence of diabetes, for the purpose of primary prevention of ischemic heart disease.

Conclusions

Thus, although there is no reason to consider MS as a separate disease, of course, this is not a set of random risk factors, since all the manifestations currently referred to as MS manifestations are in a pathogenetic relationship with each other. The choice of therapeutic tactics should be determined by the set of MS components in a particular patient.

The question of whether MS is an independent risk factor for AF or whether this risk consists of the contributions of individual components of MS remains open. It is he who, in particular, is discussed in the editorial article of the journal "Circulation" [25], dedicated to the publication of H. Watanabeetal [4] on the relationship between MS and FP. The authors of the editorial believe that in any case, the success of the prevention and treatment of AF in MS will depend on adequate treatment of hypertension, diabetes mellitus, obesity, obstructive sleep apnea syndrome, that is, on the primary prevention of AF. It is this approach to treatment that is reflected in the most important recent publications on arrhythmias: the ACC / AHA / ESC guidelines for the diagnosis and treatment of AF [26] and the ACC / AHA / ESC guidelines for the treatment of ventricular arrhythmias and the prevention of SCD [27].

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