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STUDY OF RISK FACTORS AND PROGNOSIS OF MYOCARDIAL INFARCTION IN THE POPULATION OF MEN OF DIFFERENT AGES ACCORDING TO THE RESULTS OF SCREENING IN THE ANDIJAN REGION

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Resume. According to modern data, the decrease in mortality from MI in recent years in men, especially of working age, occurs to a lesser extent than in women of the same age group. The persistence of high morbidity and mortality in Russia from CVD, including among the male population, is largely due to insufficient influence on the main risk factors for coronary heart disease and MI, which are: smoking, unhealthy diet, low physical activity and psychosomatic risk factors, arterial hypertension (AH), disorders of carbohydrate metabolism, including diabetes mellitus (DM), as well as lipid metabolism disorders and obesity.
Key words: cardiology, ischemic heart disease, myocardial infarction, risk factors, insulin resistance, dyslipidemia.

Relevance. In the global patient population, cardiovascular diseases (CVD) account for almost half of all non-communicable diseases [1]. According to the American Association of Cardiology, by 2030, mortality from CVD will reach 23.6 million people [2]. In Russia, despite the downward trend in the incidence and mortality from CVD against the background of improved therapeutic and preventive measures, which has been observed since 2003, the total number of patients with circulatory system pathology reaches 31.8 million people, and the proportion of those with coronary heart disease (CHD) is about 7.4 million patients [1]. Based on the results of the independent register of acute coronary syndromes RECORD, it is shown that the mortality rate from myocardial infarction (MI) in our country reaches 13.2%, whereas the same indicator in developed countries of Europe and the USA is significantly lower and is at the level of 6-8% [1].

A detailed study of the risk factors associated with the development of MI in men allows us to identify their age characteristics. The creation of a calculator for predicting the development of MI, taking into account the age characteristics of risk factors in men, is relevant for the possibility of identifying risk groups during occupational examinations, medical examinations, primary therapeutic examination for further application of a differentiated and individual approach to the prevention of MI.

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The purpose of the study. To carry out a comprehensive assessment of the risk factors for the development of MI in men, highlighting their age characteristics and, based on the data obtained, to develop a calculator for predicting the risk of developing MI in a particular patient.

Material and methods. The study included 112 men with Q and non-Q

They were aged 45-74 years, the average age was 58.9±0.6 years. The patients were divided into 2 groups depending on their age (middle and elderly). The first group consisted of 66 men aged 45-59 years (average age — 53.9± 0.5 years), the second — 46 men aged 60-74 years (average age — 66.2±0.8 years). The control group included 34 men without proven coronary heart disease, aged 45-74 years, the average age was 57.1± 1.2 years. The study was approved by the local Ethics Committee of the Altai State Medical University. All patients signed an informed consent form before being included in the study.

The study did not include patients with type 1 diabetes mellitus, type 2 insulin-dependent diabetes mellitus, autoimmune, acute infectious, oncological diseases, decompensated thyroid diseases, and severe renal and liver dysfunction. All men underwent laboratory tests to determine the parameters of lipid and carbohydrate metabolism with an assessment of insulin levels and calculation of the glycemic index NOME-IR, the level of C-reactive protein (CRP), as well as testosterone levels. MI was diagnosed on the basis of the third universal definition of myocardial infarction according to the recommendations of the European Society of Cardiology [4].

To assess the type of distribution of features, the indicators of kurtosis and asymmetry characterizing the shape of the distribution curve were used. The values of qualitative features are presented in the form of observed frequencies and percentages. In cases of normal distribution, as well as equality of sample variances, the Student's t-test was used to compare the samples. In the case of distributions that do not correspond to the normal law, as well as with inequality of variances, the nonparametric Mann-Whitney U-test and Wilcoxon T-test were used. The criterion $\chi 2$ was used to compare the frequencies of qualitative features. Univariate and multifactorial logistic regression analysis was used to identify predictors of MI development. The level of statistical significance when testing the null hypothesis was assumed to be the corresponding $p<0.05$. When comparing several groups with each other, Bonferroni's correction for the multiplicity of comparisons was used; data processing and graphical representation were carried out using computer programs, including Excel 2007.

Results and discussion. It is well known that more than 40% of all CVD cases are associated with smoking [1]. In addition, for middle-aged men, the fact of smoking increases the risk of sudden cardiac death by 2-3 times than in non-smoking patients of this age group [4]. Among hospitalized men, 90 (80.4%) patients were smokers; among middle—aged men, smoking was detected in 54 (81.8%) patients, among the elderly - in 36 (78.3%), p=0.8 (Table 2). Smoking was a significant risk factor for MI for the men we examined, especially among middle-aged people, which underlines the importance of correcting this risk factor.

Overweight and obesity are independent predictors of the development of MI, while it is important to emphasize that it is the abdominal type of obesity that is an essential predictor of sudden cardiovascular events and a marker of earlier development of stenosing atherosclerotic lesions of the coronary arteries [5, 6]. The influence of obesity and overweight on the risk of developing MI in men significantly increases due to more complex control of risk factors such as hypertension, dyslipidemia, hyperglycemia, microalbuminuria in this group of patients [7].

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In the group of middle—aged men, the body mass index (BMI) was 26.6±0.4 kg; overweight patients prevailed - 28 (42.4%), those with obesity of I and II severity were 16 (24.2%). Among middle-aged men with obesity, 10 (62.5%) patients had abdominal type. In elderly men, the BMI index was 27.2±0.6 kg (p=0.4); overweight patients also prevailed among them — 17 (36.9%), grade I obesity was diagnosed in 14 (30.4%) patients, those with obesity of II and III severity among the second group of patients were not. Abdominal obesity was detected in 9 (60%) elderly men (Table 2). Based on the data we obtained, it was shown that overweight people predominate among men with IT. Taking into account the increase in the prevalence of overweight and obesity, including abdominal obesity, in men over the past

decades, it is difficult to overestimate the importance of measures aimed at normalizing body weight in order to reduce the morbidity and mortality of the population from coronary heart disease in general and MI in particular.

Burdened heredity as a risk factor for MI was detected among middle—aged men in 6 (9.1%) patients, and among the elderly - in 7 (15.2%), (p=0.03), which generally indicates a significant role of burdened heredity in the male population. It is known that an increase in blood pressure (especially uncontrolled hypertension) contributes to the formation and progression of CVD and increases the risk of developing MI in men [2].

According to modern researchers, hypertension preceding myocardial infarction will contribute to the more frequent development of a complicated course of MI with the formation of left ventricular dysfunction, heart failure and an increase in the frequency of deaths [8]. Among middle—aged men, hypertension was detected in 40 (60.6%) patients, in most of them — grade 1 hypertension — 30 (75%), uncontrolled hypertension (grade 2 and 3 hypertension with unstable course) - in 10 (25%). Among older men, hypertension was detected in 40 examined patients (87%, p=0.005), indicating an increase in the number of patients with hypertension with age; uncontrolled hypertension was diagnosed in 18 (45%), elderly men with MI, p=0.1. Thus, among the examined men, patients with grade 1 hypertension prevailed 62 (86.1%), however, among the elderly, more people with grade 2 and 3 hypertension and its uncontrolled course were identified.

Rational and timely antihypertensive therapy is a necessary link in the primary and secondary prevention of MI in men in each age group. It is known that disorders of carbohydrate metabolism, including type 2 diabetes, are one of the key factors in the development and progression of CVD, including MI [9]. Disorders of carbohydrate metabolism were detected in 21 of 112 (18.8%) examined men with MI; impaired carbohydrate tolerance (HTG) was diagnosed in 2 (3%) middle-aged patients and 4 (8.7%) elderly, p=0.4. Type 2 diabetes mellitus was detected in 7 (10.6%) middle—aged men and 8 (17.4%) elderly, p=0.4 (Table 2). Fasting glucose levels in middle-aged men were 5.1±0.1 mmol/l, in the elderly - 5.6±0.2 mmol/l (p=0.03).

The presence of insulin resistance is an important generally recognized cardiovascular risk factor that increases the likelihood of developing MI complications and the risk of recurrent cardiovascular events [10]. Insulin resistance was diagnosed in 30 (26.8%) of the examined men, and in the middle—aged group — in 18 (27.3%) patients, in the elderly group - in 12 (26.1%), (p=0.9). The average insulin level among middle—aged men was 13.9±1.9 mem/ml, in the elderly - 12.9±1.6 MEM/ml, (p=0.7). In middle-aged men, the index of insulin resistance (HOMO—IR) was 3.1±0.5 meED/ml, in elderly patients - 3.4±0.5 meED/ml, (p=0.2).

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Thus, in the studied male population, disorders of carbohydrate metabolism, to a greater extent due to the development of insulin resistance, are one of the important risk factors for the development of MI. Monitoring of carbohydrate metabolism, prevention of the development of HTG and diabetes mellitus, diet and hypoglycemic therapy are necessary as preventive measures for middle-aged and elderly men. It is known that at least 39% of the general patient population have an elevated level of OHS [2].

Timely reduction of blood lipids contributes to the prevention of sudden cardiovascular events [11]. Lipid metabolism disorders were detected in 57 (86.4%) middle-aged men and in 42 (91.3%) elderly patients (p=0.9), which indicates a high incidence of dyslipidemia among men both on average and in old age (Table 2). Lipid metabolism disorders in the examined patients are mainly represented an increase in LDL levels to 2.5 ± 0.1 mmol/l in middle age, and to 2.8 ± 0.1 mmol/l in the elderly (p=0.1).

Thus, lipid metabolism disorders are common in men of each age group, to a greater extent they are represented by an increase in LDL levels. Changes in the level of sex hormones have an important effect on the development and progression of coronary heart disease in the general patient population. A decrease in testosterone levels contributes to a deterioration of the lipid profile in men, the progression of atherosclerosis, an increase in blood pressure, the development of endothelial dysfunction, which, in turn, affects the rate of progression of coronary heart disease and, as a result, increases the risk of developing MI [12].

Testosterone levels in middle-aged and elderly men were within the normal range and amounted to 12.6±0.8 nmol/l and 12.9±0.9 nmol/l for middle-aged and elderly people, respectively, p=0.8. In recent years, modern domestic and foreign researchers have paid great attention to studying the role of physical inactivity and psychosocial risk factors in connection with myocardial infarction [13]. In the middle—aged group, inactivity was detected in 40 (60.6%) patients, among the elderly - in 36 (78.3%) of the examined; the level of inactivity was slightly higher in patients of the second group (p=0.08), which indicates a regular increase in the level of inactivity in men with age. Among men hospitalized with MI, depression was detected in 5 (7.6%) middle-aged patients and 8 (17.4%) elderly, p=0.2. An increased level of anxiety was detected in 13 (19.7%) middle-aged men and 6 (13%) elderly people, p=0.5.

The control group consisted of 34 middle-aged and elderly men without proven coronary heart disease. The majority of patients in the control group were diagnosed with AH — 28 (77.8%). Heredity burdened by coronary heart disease was detected in 14 (41.2%) individuals when analyzing their life history. 23 (67.6%) men of this group turned out to be smokers. The average body mass index (BMI) in patients of the control group was 28.3±0.8 kg/m2. There were 11 overweight patients among the examined individuals (32.4%), 13 with obesity of varying severity (38.2%), most of whom were diagnosed with grade I obesity — 10 (76.9%). Among men in the control group with obesity, the abdominal type of the latter was detected in 6 (46.1%). Disorders of carbohydrate metabolism were diagnosed in 5 (14.7%) patients, of whom HTG was diagnosed in 3 (8.8%) individuals, and type 2 diabetes in 2 (5.8%). The average level of fasting blood glycemia in this group of patients was 5.4±0.1 mmol/l. The average insulin level in the control group was at the level of 8.03±1.5 μm/ml, the insulin resistance index (HOMO-IR) was within the normal range and amounted to 2.1± 0.5 meED/ml. Lipid metabolism disorders were detected in 22 (64.7%) men of the control group. A decrease in the level of physical activity was detected in the majority of men in this group — 22 (64.7%), an increased level of anxiety — in 5 (14.7%), clinical and subclinical depression — in 3 (8.8%) of the examined individuals.

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To assess the impact of risk factors on the development of myocardial infarction in the examined men and the possibility of predicting the risk of its development for a particular patient, a mathematical calculator was developed. For this purpose, using criteria for testing statistical hypotheses, the most significant predictors (risk factors) were identified, which later formed the basis of the riskometer.

Conclusion. Thus, for middle—aged men with MI, the most significant risk factors were smoking, lipid metabolism disorders (mainly due to increased LDL levels), overweight and abdominal type of obesity; for older men, additionally hypertension and inactivity, the presence of burdened heredity, disorders of carbohydrate metabolism with the development of insulin resistance, as well as abdominal the type of obesity. A mathematical calculator developed using modern statistical methods allows you to help calculate the probability of developing nonfatal MI in a particular patient. The use of the calculator in therapeutic and cardiological practice will help identify risk groups for developing MI among the male population and increasethe effectiveness of primary and secondary prevention programs.

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