

## Role of Risk Factors in the Development of Myocardial Infarction in Young Men Depending on Family History

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**Abstract:** we examined 96 men, of which 62 (27.2%) aged 35 to 45 years were identified as suffering from coronary heart disease. Each patient was interviewed in the form of a standardized survey, which included identification of CSD, including a family history of MI. Monitoring and blood pressure measurements were carried out.

The most informative in terms of assessing the likelihood of developing a myocardial infarction are the following signs: age, increased concentrations of total cholesterol, triglycerides, low-density lipoproteins, death from stroke or heart attack.

**Key points:** myocardial infarction, diseases of the circulatory system, coronary heart disease, blood pressure, cholesterol.

**Relevance.** Diseases of the circulatory system (CVD), and primarily acute myocardial infarction, are the main cause of primary disability and mortality in the population. Every year, about 70 million people die from CSD in the world, which is 29% of all deaths in the world according to WHO, and about half of them are deaths from acute myocardial infarction (AMI). The causes of mortality are diverse and include both social determinants of health status and the high prevalence of risk factors in the population.

Accordingly, it is necessary to introduce effective measures to preserve health at all levels, including the health care system [6,7,8].

In recent years, there has been a rejuvenation of myocardial infarction (MI) and the disease is increasingly developing in people under 45 years of age, which is associated with modern lifestyle changes and an increased risk of early development of cardiovascular pathology.

Rice factors include young men, smokers, people with a hereditary predisposition to the early development of CSD and those who have problems with employment. For the prognosis of the disease, it is important to assess the risk of developing complications, in particular heart failure, and in young people the risk of its development is the lowest. The cause of AMI is thrombosis of a coronary vessel in the area of an existing atherosclerotic plaque. Clinical manifestations and consequences of MI depend on the location of the obstruction, severity and duration of myocardial ischemia [2-10]. Despite great progress in the diagnosis and treatment of cardiovascular pathology, cardiovascular

diseases continue to be the most pressing problem in cardiology and overall healthcare [4,5].

**The purpose of the study** was to study the most reliable signs of the development of MI among males at a young age, depending on the main risk factors and family history.

**Materials and methods of research.** We examined 96 men, of which 62 (27.2%) aged 35 to 45 years were identified as suffering from coronary heart disease (CHD). Each patient was interviewed in the form of a standardized survey, which included identification of CSD, including a family history of MI. Blood pressure (BP) was monitored.

The data of electrocardiography, echocardiography, Holtor monitoring, anthropometry. The blood concentrations of cholesterol (C), triglycerides (TG), and low-density lipoprotein cholesterol (LDL-C) were determined. All family history and risk factors were analyzed.

**The results of the study** showed that out of 62 men with coronary artery disease, 60 (37.0%) had previously suffered a myocardial infarction. From the anamnesis, among 60 patients with coronary artery disease, there were parents, namely 71 fathers, and 46 mothers, who were alive at the time of the survey. From the anamnesis of the parents of these patients, the cause of death in 24 male parents and 22 female parents was a heart attack, 10 male parents and 16 mothers died from cerebral stroke.

To study the relationship between the development of MI, risk factors and indicators of family history, one of the multivariate discriminant analysis (DA) procedures, the so-called stepwise ANOVA (SDA), was used, which allows us to determine a subset of signs that best describe the dependence of the prevalence of MI on risk factors and signs of the standardized questionnaire "Family anamnesis".

According to the results of our study, all major risk factors, with the exception of total cholesterol, LDL-C and smoking, prevailed in groups of men with IHD compared with men without IHD.

Patients with MI were on average older than men without this disease, had a higher level of education, higher concentrations of cholesterol, TG, levels of systolic blood pressure and diastolic blood pressure, and body mass index (BMI).

Groups of patients with MI were examined separately according to non-strict (26 men) and strict (15 men) criteria.

It has been established that the prevalence of MI according to non-strict criteria is associated with risk factors such as age, cholesterol, LDL cholesterol, CSD in parents, diabetes mellitus in the mother or father, and increased systolic blood pressure in the subject. At the same time, the prevalence of MI according to strict criteria depends on the combination of other signs, the first three of which coincide (age, cholesterol concentration, LDL cholesterol) with informative signs that determine the likelihood of developing MI according to non-strict criteria. The next most important are the death of the father from a stroke or heart attack. Finally, the last sign is the concentration of TG in the patient's blood plasma.

In both cases, the signs, when analyzing the family history, occupy a significant place among other studied signs. Thus, of the 6 signs that best describe the dependence on them of the prevalence of MI according to non-strict criteria, 5 indicators are from family history, and of the 5 signs that determine the probable development of MI according to strict criteria, 3 indicators were data from family history. At the next stage of the study, predictive models were built based on the selected features.

The calculated index estimates indicate that the higher the value of the risk factors, taken together, the higher the likelihood of developing MI. At the same time, the results of a comparative analysis of empirical (observed) and theoretical estimates of the probability of developing MI indicate the high reliability of the selected signs. So, if in the first group, which included those examined with the lowest values of the selected indicators, the risk of MI is 1 case in 30, then in men who were in the sixth group, with the highest values of the selected indicators, the risk of incidence is almost 10

times higher.

Thus, as the research materials have shown, the structure of hereditary predisposition to MI is extremely complex. The chosen research design was effective in studying the role of family history in the prevalence of MI among men in the selected group and made it possible to obtain quantitative estimates of the studied risk factors.

Identification of the features that make the main contribution to the information content function, calculated taking into account the dimension of the feature space and sample size, made it possible to determine that for MI, according to strict criteria, the features in the order of greatest informativeness were arranged as follows: age, TG level, cholesterol, LDL cholesterol concentration, death father from a stroke or heart attack.

The use of selected features to construct prognostic indices calculated on the basis of a discriminant model indicates a statistically significant contribution of the set of features to the probability of developing MI. As calculations have shown, the prognostic indices of the empirical and theoretical risk of developing MI largely coincide. If persons according to the selected characteristics are included in the first group of 10% of the distribution, then the risk of developing MI in men 35-45 years old is 1 case in 30, while in the sixth group every third person examined has a risk of developing MI.

**Conclusions.** Thus, the data from the family history questionnaire: death from a heart attack of the father or mother, death of the father from a stroke, the presence of arterial hypertension, stroke, diabetes mellitus in the mother are statistically significantly more common in men aged 35-45 years suffering from coronary artery disease, compared with persons without this disease.

The most informative in terms of assessing the likelihood of developing myocardial infarction are the following signs: age, increased concentrations of total cholesterol, triglycerides, low-density lipoproteins, death from stroke or heart attack. Calculations of prognostic indices of the empirical and theoretical risks of developing myocardial infarction, based on the results of this study, indicate, that among men aged 35-45 years, who had the lowest values, according to the identified set of signs, myocardial infarction can develop in 1 out of 30 cases, and among these same men with the highest values of the selected signs, i.e. in the top groups of the distribution in 1 out of 3 cases.

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