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Features of the Clinical Course of Myocardial Infarction in Type 2 Diabetes

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ABSTRACT

The features of the clinical course of myocardial infarction in patients with type 2 diabetes mellitus were studied.

Among men hospitalized with myocardial infarction, diabetes mellitus was in 56.3%, among women in 72.2%. The mean age of patients with and without DM was 69.9 ± 8.7 and 67.4 ± 7.1 , respectively. In patients, painless forms of MI were more common and the anterior and lateral walls of the left ventricle were predominantly affected. In most patients, it was accompanied by severe decompensation of carbohydrate metabolism with high glycemia.

Keywords:

myocardial infarction,

Relevance

Diabetes mellitus has now universally acquired the character of one of the main medical and social problems due to the steady increase in the incidence over the past decades, both in developing countries; and in industrialized countries, where its prevalence in the population reaches 5-6% [2,11]. The World Health Organization (WHO) predicts an increase in the population of these patients over 25 years, by 2025, from 130 to 300 million people [5,8,10]. There is no doubt about the adverse effect of diabetes on the state of the cardiovascular system.

One of the most severe manifestations of cardiac pathology is acute myocardial infarction (MI), the problem of which in patients with DM has traditionally attracted the

attention of many researchers in recent years [1,3,5,9] due to its wide prevalence, an increase in the number of patients, the severity of the course and prognosis.

DM is recognized as an independent risk factor for MI (2-3 times), stroke (more than 2 times) and deaths (2 times), regardless of other known risk factors for cardiovascular disease [4,7], while acute coronary events are characterized by particular severity in DM against the background of severe coronary atherosclerosis [13].

MI in DM, in addition to being widespread, is also characterized by a greater severity of the course [4,6], which is due to a number of factors. DM is recognized as a strong and independent risk factor for coronary artery atherosclerosis and coronary artery disease,

exceeding that by 3-5 times in comparison with patients without DM [12].

Target. To study the features of the clinical course of myocardial infarction in patients with type 2 diabetes mellitus.

Materials and methods.

We observed 70 patients with acute MI with both the presence (38 people) and the absence (32 people) of DM. MI was diagnosed based on the criteria proposed by the European Society of Cardiology and American College of Cardiology, 2000, including at least two of the three classic signs: typical clinical symptoms, ECG findings (signs of Q or non-Q MI, manifested in the form of ST-segment and wave dynamics T).

The course of MI at the inpatient stage was evaluated in 70 patients, of which 38 had DM. (main, group I), without SD-32 pers. (control, group II). The average age of patients in the groups was 69.9 (45.1-78.7) and 63.4 (44.9-69.9) years, $p=0.3$, in group I there were 25 women (65.8%), in II 13 (40.6%), $p=0.04$.

Results and discussions

The prevalence of DM out of 70 people (30 men and 40 women) DM occurred in 38, therefore, its frequency was 54.3%. In this group of patients, women predominated (72.2%, 26 people), while among patients without DM, men were more common (56.3%, 18 people). The mean age of patients with and without DM was 69.9 ± 8.7 and 67.4 ± 7.1 years, respectively, i.e. patients with DM were slightly older with a predominance of women in the group, which is generally characteristic of the subpopulation of these patients.

Further, the clinical and metabolic features of the course of myocardial infarction in diabetes mellitus were studied. The results of a comparative analysis of the course of the acute period of MI depending on the presence (main, group I patients) and the absence of diabetes (control, group II) are presented in Table 1.

Table 1
Characteristics of MI in patients with DM (%)

Indicator	I group (n=38)	II group (n=32)
Repeated MI	47%	23,4%
Q MI	46,3%	39,1%
Class of severity of acute heart failure (Killip)	1	22,2%
	2	48,4%
	3	23,8%
	4	5,6%
MI severity class	1	4,1%
	2	16,4%
	3	18,3%
	4	61,2%
Pain during hospitalization	64,2%	82,5%
Late (after 6 o'clock) hospitalization	41,0%	30,7%
Complications of the acute period of myocardial infarction		
cardiogenic shock	5,6%	3,3%
- arrhythmias	48,1%	28,2%
- AHF (pulmonary edema)	22,0%	9,9%
- LV aneurysm	21,7%	20,4%
- early postinfarction angina pectoris	51,5%	37,8%
AG	82,5%	61,4%

It is characteristic that in patients with DM, a typical pain variant of the onset of MI was less frequently observed according to the clinical classification of A.L. Syrkina [12] ($64.2 \pm 82.5\%$), which caused somewhat more frequently detected cases of late (after 6 hours or more) hospitalization of patients. The atypical course of MI in DM is noted by many authors [1,2,11], pointing to the possibility of painless forms: ischemia and MI in DM, largely due to: violations of the autonomic regulation of the activity of the heart, autonomic diabetic autonomic neuropathy. The presence of a painless variant of the course of the acute period. MI correlated with the duration of DM, the presence of "diabetes-associated" complications - diabetic nephropathy (DN),

peripheral polyneuropathy, as well as with a relatively low (<5.5 mmol/l) glycemia during hospitalization.

The asthmatic variant of the onset of MI was more often observed in the main group (28.3 and 9.1%), which indicates a more pronounced severity of heart failure in DM, confirmed by the data on the assessment of acute heart failure according to the T. Killip criteria (Table 1) and a reduced ejection fraction left ventricle. Arrhythmic (6.7 and 2.0%) and asymptomatic variants of MI (12.6 and 7.7%) were also more often detected in the main group of patients with MI.

Localization of MI according to ECG data in the groups varied with a predominance of necrosis of the anterior or posterior walls of the myocardium. Other localizations were less common (Table 2) and did not differ significantly in frequency between the groups ($p>0.05$).

Table 2
Localization of myocardial infarction groups (%)

MI localization	I group	II group
1. Front	38,2	26,5
2. Rear	23,5	33,8
3. Anterior-lateral	10,8	11
4. Antero-septal	7,8	7,7
5. Anterior-posterior	7,8	8,8
6. Anterior-septal-apical	5,9	6,8
7. Posterior-lateral and septal	5,9	5,3

Comparison of the severity of myocardial infarction depending on gender in patients with DM revealed the following. Women were somewhat older - 69.8 ± 8.7 years versus 61.4 ± 8.8 years in men, with a longer history of DM - 10.3 ± 7.8 versus 6.4 ± 2.8 years. There were no statistically significant differences in such characteristics of coronary pathology as the frequency of recurrent MI in men and women (33.3 and 35.0%), Q-MI (41.7 and 43.0%), the duration of coronary anamnesis > 5 years was observed with a frequency of 38.6% and 59.4%, respectively, $p>0.05$.

From the foregoing, it can be concluded that MI is more severe in women, which manifests itself against the background of a long history

of DM in older patients in the form of a significantly higher frequency of severe myocardial dysfunction according to echocardiography.

Table 3
The course of myocardial infarction in patients with diabetes depending on gender

Indicator	Men	Women
Age, years	$61,4\pm 8,8$	$69,88\pm 8,7$
Duration, history of diabetes, years	$6,4\pm 2,8$	$10,3\pm 7,8$
EF, %	$48,2\pm 5,1$	$44,1\pm 3,7$

The influence of gender on the course of pathology in patients with MI without DM was also assessed. As a result of the analysis, it was revealed that among these patients women are significantly older - 68.1 ± 7.9 and 58.2 ± 6.5 years, the presence of MI in anamnesis was more often detected in women 59.0 and 21.7%, at the same time the frequency of Q MI prevailed in men 60.9 and 27.2%. Analysis of the nature of complications showed the following. The frequency of LV aneurysm prevailed in men 30.4 and 18.1%, as well as early postinfarction angina (45.4 and 22.1%) were more often detected in women. The frequency of high 3 and 4 classes of MI in the groups did not differ 47.8 and 53.5%. The analysis performed allows us to conclude that there was no significant difference in the severity of myocardial infarction in patients without DM depending on the sex in our patients.

Comparison of metabolic parameters in groups 1 and 2 of MI patients showed the following (table 4).

Table 4
Metabolic parameters in patients with MI in groups

Indicator	I group	II group
Glycemia during ICU hospitalization, mmol/l	9,5 (7,4-11,1)	5,4 (3,9-5,6)
Urea, mmol/l	9,5 (6,1-11,3)	6,4 (5,3-7,4)
Total cholesterol (cholesterol), mmol/l	5,4 (4,6-6,4)	5,5 (4,6-6,2)
Triglycerides, mmol/l	2,2 (1,6-2,9)	1,7 (1,2-2,2)
HDL cholesterol, mmol/l	0,85	1,1 (0,82-

(0,64-1,07)	1,3)
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The development of MI in DM in most patients was accompanied by severe decompensation of carbohydrate metabolism with high glycemia. Outside of diabetes, the average glycemia during hospitalization did not go beyond the normal range, patients of the main group also differed in higher numbers of triglycerides and urea due to the predominance of catabolic processes.

Attention was paid to pronounced metabolic disorders in the main group and, first of all, glycemia indicators during hospitalization in a hospital.

Thus, DM certainly aggravates the course of the acute period of MI, which manifests itself in the form of greater severity; acute heart failure according to the classification of T. Killip, reduced EF, as well as a greater prevalence of maximum, class 4 severity of myocardial infarction according to the criteria of L.F. Nikolaeva and D.M. Aronova. Patients in this category were less likely to report a typical pain syndrome in the acute period of MI, with a tendency, therefore, to a higher frequency of delayed hospitalization.

Findings. Thus, among men hospitalized with myocardial infarction, diabetes mellitus was in 56.3%, among women in 72.2%. The mean age of patients with and without DM was 69.9 ± 8.7 and 67.4 ± 7.1 , respectively. In patients, painless forms of MI were more common and the anterior and lateral walls of the left ventricle were predominantly affected. In most patients, it was accompanied by severe decompensation of carbohydrate metabolism with high glycemia.

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