Comparative Characteristics of The Effects of Drug and Mechanical Reperfusion in The Treatment of Acute Coronary Syndrome with ST Elevation in Patients Working in Environmentally Challenging Conditions

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Abstract

Studied clinical and hemodynamic efficacy of complex use heparin, Cysc To-Mac, propranolol (obzidan), fosinopril (monopril) with and PCI; PCI conducted separately on hemodynamics on cardio hemodynamics on ekoendotoksiskoz (AMP) and the clinical course of patients working in environmentally stressful conditions in the acute phase and follow-up of MI. Comparison of the results of complex mediakamentoz and mechanical revascularization with PCI conducted separately. Investigated 50 patients with STMI in the age of 30 to 70 years (56.7 ± 1.20 years). Of the 50 patients 25 were treated Cyto-Mac, foznopril, propranolol with heparin and PCI (group 1); 25 patients were treated with PCI alone (group 2). In both groups, blood was determined by the degree ekoendotoksiskoza (AMP) by EchoCG and Doppler EchoCG studied ESV, EDV, EF, SI, CI , an local contractility violation index of left ventricle (LCVI) , with the aid of restenosis koronorografii. A well established dynamics of systolic and diastolic blood pressure, clinical features of MI during follow-up. Patients treated heparin,Cysc To-Mac, propranolol, foznopril and PCI indicators of central hemodynamics stabilizis. The reduced ESV, EDV, LCVI and decreased degree of ekoendotoksikoza (AMP), improves left ventricular systolic function of demand , increases PV. However, in this group, one patient on the third day was recorded AHF and one recurrent MI. In The group spent only 2 PCI in relapse developed MI, 1 - restenosis, 2 -AHF and 1 patients died. The results show that the combined application of drug therapy with PCI provides a positive result in comparrison with than separately conducted PCI in ACS with elevation ST.

Keywords: ekology, ekoendotoxicosis, ACS, STMI, treatment, heparin, Cyto-Mak, fozinopril, propranolol, percutaneous coronary intervention (PCI), hemodynamics, cardiodynamics, clinical current
1 | INTRODUCTION

Currently, a significant part of the diseases are derived from the state of environmental stress. [1–5] The progress of the industry increases the dispersion of various substances in the atmosphere, soil, water, heating of the environment, electromagnetic radiation, the power of explosions, and so on, which cause progressive environmental degradation, poor human health contribute to the development of disease and mortality. [1–5] As you know, in industrialized countries, the main cause of death in the elderly are diseases of the cardiovascular system, in particular MI (about 50%). [1, 3, 6, 7] According to the WHO, at present, a significant part of diseases is derived from the effects of anthropogenic-emergency factors (SO2, H2SO4, NO, CO, CO2, electromagnetic radiation, etc.) on the human body, causing chronic poisoning, which contribute to an increase in average molecules - peptides (AMP). The level of medium molecules - peptides is a test characterizing the severity of endotoxemia. [2–5, 7] Ecoendotoxicosis enhances the influence of risk factors for coronary heart disease, increases myocardial hypoxia, reduces tissue resistance, worsens blood rheology and impairs microcirculation. All this contributes to an extensive myocardial damage [1, 2, 4, 7], which leads to a complication of myocardial infarction: heart failure (HF), rhythm disturbance (HP) and sudden coronary death [1, 6].

The failure of treatment of MI often depends on the inadequate assessment of the severity of environmental exo- and endotoxemia associated with the massive entry into the bloodstream of products of catobolism from the focus of necrosis and xenobiotics. [1, 4, 8]

In this regard, a search is currently underway for new methods of exposure that contribute to the reduction of AMP, preventing or decreasing the development of various complications in the early stages of STEMI. [1, 6] The treatment strategy for myocardial infarction is to prevent the spread of ischemic myocardial damage and prevent its complications: heart failure, cardiogenic shock, primary ventricular fibrillation, which is achieved in the first 1-6 hours (24 hours) of the disease. [1, 6, 9] The main objective in the treatment of patients with STEMI is medication or mechanical recanalization of a heart attack-associated coronary artery. [6, 10, 11]

In the middle of the last century, it was confirmed that successful mechanical reperfusion performed in the acute period of STEMI was accompanied by a decrease in the degree of contractile dysfunction of the left ventricle (LV), a decrease in the volume of necrosis and, as a result, an improvement in survival and a decrease in mortality. [10, 12, 13] However, the efficacy and safety of the complex use of drug and mechanical reperfusion remains a matter of discussion and there is no single change about their use [6, 12, 14, 15], which are associated with the duration and contraindication of its use [1, 10, 14]. It is impossible for all patients with STEMI to perform myocardial revascularization with surgical interventions or thrombolytic drugs (especially after 12 hours from the onset of MI), it becomes necessary to search for other medication ways to restore the function of radiomyocytes in the perinecrotic (ischemic, hibernating myocardium) zone. [10, 12, 14, 16]

Recently, thrombolytic therapy and angioplasty (percutaneous coronary intervention - PCI) of the affected coronary vessel have been used to reduce MI complications [6, 9, 10, 12, 15, 17]. Meanwhile, there is evidence that after thrombolytic therapy, every third patient develops recurrence of MI already on the first day [6, 10, 11], stenosis remodeling continues in a heart-related artery. [6, 10–12, 17] And with mechanical reperfusion in the early stages of myocardial infarction, the frequency of adverse outcomes increases [9, 12, 16]. In addition, the effectiveness and safety of their complex use remains the subject of discussion and there is no consensus on their use [1, 6, 14]. Instead, due to the variety of pathogenetic factors that underlie the formation

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In this regard, it is recommended to use Cytomac for environmental exo- and endotoxemia, as well as for poisoning (1, 12, 13).

Reinvasive use of cytomac + propranolol (Obzidan, Germany) in the acute period of STEMI, subjected to myocardial revascularization, is considered an important component of myocardial protection, which reduces mortality in patients of this category. At the same time, β-adrenergic blocking therapy is associated with a lower incidence of development with atrial fibrillation in the early mechanical reperfusion period. [9, 14]

There are no data in the literature on the combined use of cytomac, high doses of anticoagulants (heparin), β-adrenergic blocking agents and cytomac in combination with PCI is not yet fully disclose. [1, 12–14]

Considering all the latest literature, we conducted this study to study the efficacy in the complex use of fosinopril (monopril, Bristol-Myers) high doses of heparin + cytomac + propranolol (obzidan, Germany) and together with PCI for ecoendotoxosis, hemodynamics, cardiodynamics, electrical in-

2 | MATERIAL AND RESEARCH METHODS

42 patients with ACS were studied: anterior myocardial infarction with ST segment elevation (STEMI) at the age from 30 to 70 years (56.7±1.20 years). The number of examined included 34 (80.8%) men, 8 (1.1%) women. Using individual randomization, the patients were divided into 2 groups of 21 people each. In the 1st group, heparin with cytomak, propranolol and fosinopril and PCI was used, in the 2nd, only PCI. All patients worked in environmentally stressful conditions under the influence of anthropo-emergency factors (SH2, SO2, H2SO4, NO, CO, CH2, electromagnetic radiation, etc.).

The diagnosis of MI was based on the study of blood enzymes - troponin i, t (Ti, Tt), MB KFK and clinical, ECG criteria recommended by WHO experts (1976, 1991).

In all groups, the degree of ecoendotoxosis (the average peptide molecule - AMP) was determined according to the method of V.I. Lipatov et al. modified by O.A. Yakovlev by spectrophotometric method. The functional parameters of the left ventricle were studied using an EchoCG on an SSD 500 device (Aloka, Japan). End systolic and diastolic volumes (ESV and EDV), local contraction violation index (LCVI), LV ejection fraction (EF). Using pulse-wave Doppler echocardiography by recording the Doppler signal in the LV outflow tract at position 3 of the chamber, the stroke volume (SV), stroke index (SI), minute volume (MV), and LV cardiac index (CI) were determined. Ventricular extrasystoles (VES) were detected by recording an electrocardiogram (ECG) on a magnetic tape of a Holter system monitor (Cardet company), and the clinical course of the disease was evaluated: SBP, DBP, heart rate, the occurrence of early restenosis, which was established in 1-5, 5 months using coronary angiography, recurrence of myocardial infarction, development of AHF and mortality during follow-up. In this case, the acute HF was determined according to the Killip classification for 7 days.
Fosinopril was used in the first 3 days, 2.5 mg once in the morning, then 5 mg per day for 10 days and 10 mg per day on the following days of MI. Propranolol at a dose of 0.1% -5 mg was injected intravenously bolus for 5 minutes. Then, 0.02 mg / kg / min was administered intravenously at 20-25 drops per minute 4 times for 24 hours, then oral administration of the drug in a dose of 80 to 120 mg per day was used. 15 mg of cytomac was administered intravenously by bolus, then 20-25 drops 3 times a day for 3 days. All patients received heparin: 40,000 units were first administered intravenously and simultaneously 10,000 units subcutaneously, followed by every 6 hours on the 1st day, for 2-3 days - 10,000 units every 8 hours, on days 4-5 - 10 000 IU every 12 hours, on the 6th day - 10 000 IU once a day, followed by the administration of the anticoagulant warfarin 1 tablet (2.5 mg) 2 times a day and Aspirin Cardio 300 mg per day. Patients of the 2nd group were given only PCI and 2 times a day were given Aspirin Cardio 300 mg per day.

The material was statistically processed using the software package “Statistics 6.0”, the values of M were calculated, their standard errors (m) and a 95% reliable interval. In this case, the nonparametric Mann-Whitney criterion and the exact R. Fisher criterion were used. The difference was considered significant at P <0.05.

### 3 | RESULTS

The results of the study show that patients working in environmentally challenging conditions have a high degree of ecoendotoxosis (see table 2).

Analysis of hemodynamic parameters: SBP, DBP, SV, SI, heart rate, data on environmental endotoxemia, which were expressed an increase in the level of AMP, both in the group of patients treated with fosinopril, heparin with propranolol, cytomac, PCI, and separately PCI did not differ significantly upon admission of patients to the hospital (p> 0.05; table 2). The group included patients mainly with hyper- and eukinetic hemodynamic variants. The dynamics of the change in the parameters of central hemodynamics and AMP on the days of treatment are presented in table 2 (p> 0.05).

In patients of the 1st group, after 12 h, a decrease in the level of AMP was observed by 50% (p <0.001). In this case, a decrease in blood pressure was noted from 144.0 ± 2.3 / 96.4 ± 1.3- to 133.0 ± 2.3 / 80.9 ± 1.7 mm Hg., and until the end of the study decreased to 118.0 ± 1.8 / 75.9 ± 3.2 mm Hg. (p> 0.001; see table 2). In this group, in 3 patients, the level of AMP remained at a high level and there was a tendency to a decrease in blood pressure (up to 100/60 mm Hg). After treatment, the AMP rapidly decreased (to the norm - 0.24 ± 0.11 unit) and blood pressure increased to 115/65 mm Hg.

PCI conduction contributed to an insignificant decrease in AMP and blood pressure. After 24 hours, AMP decreased by 5% (p> 0.05). Blood pressure was
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124.8 ± 3.4 / 74.90 ± 2.40 mm Hg, and on 7 day 118.0 ± 1.7 / 75.1 ± 1.6 mm Hg, AMP 0.46 ± 0.02 conventional units (p <0.001; see Table 2).

In patients of the 1st group, a significant decrease in SV, SI was not recorded; on the contrary, they increased by 53.6% and 27.5%, respectively), significantly differed from the initial level (p <0.001) and from the data of the 2nd group (p = 0.05; see table 2). At the same time, the AMP decreased from 0.58 ± 0.03 to 0.26 ± 0.05 units.

Significant reduction in heart rate in patients of the 1st group was observed after 24 hours - from 100.0 ± 1.2 to 75.90 ± 1.40 beats per minute and at the end of the study was 70.10 ± 1.9 beats per minute (see Table 2). In the 2nd group, after 24 hours, a decrease in heart rate was not registered. However, after 72 h, a decrease was noted and amounted to 75.32 ± 1.80 beats per minute.

Changes in indicators characterizing LV functions during the study are presented in Table 2.

In patients of the 1st group, EDV progressively decreased during observation and treatment and statistically significantly differed from the indicator before treatment with MI (p <0.001) and from the data obtained in the 2nd group (p <0.01). In patients treated only with PCI, there was also a tendency to a decrease in FDV (Table 2). In 84% of patients of the 1st group, 75% of patients of the 2nd group showed a decrease in LV EDV. In 16% of patients of the 1st group, in 25% of the 2nd group, there was no decrease in EDV and its dynamics.

ESV in the 1st group and in the 2nd group decreased by 43.3% and, by 32.9% of patients, respectively and significantly differed (p <0.01; Table 2).

The initial LVEF values as the main indicators of LV systolic function between the groups were not different (p <0.005; Table 2). In the 1st group, by the end of the 1st day and on the 7th day, the PV increased (45.40 ± 2.5% and 61.91 ± 1.12%, respectively) and these indicators differed in the 2nd group in the corresponding observation period (45.90 ± 2.10% and 54.31 ± 1.11%).

Due to a significant decrease in the extent of the lesion, the degree of myocardial asinergy in the patients of the 1st group of LV LCVI decreased by 50.9%. In the 2nd - indicators of LV LCVI decreased by 49.4% (p > 0.001; Table 2).

The experience of observation and treatment of acute myocardial infarction showed that in addition to heart failure and rhythm disturbance, electrical instability of the heart plays a huge role in determining the prognosis for this disease. An attempt was made to evaluate the antiarrhythmic effect of propranolol with a high dose of heparin and monopril and a separate PCI performed according to the frequency of occurrence of rhythm disturbances in the early stages of MI. The daily recording of an electrocardiogram on magnetic tape revealed rhythm disturbances in 95-97% of patients who received both a high dose of heparin with cytomac, monopril and propanolol PCI, and separately PCI. In group 1, when recording an ECG on magnetic tape, monopacexstrastyloes were recorded in 13 (59.1%) patients, polytopes in 3 (14.3%), frequent in 10 (47.6%). In the 2nd group, which was performed only PCI, the so-called "threatening" VES were recorded, in particular polytopic, paired, salvo (three in a row or more), or short paroxysms of ventricular tachycardia in 20 (90.9%) patients, rare monopacexVES –16 (72.9%)

Note: p- significance of differences between groups As can be seen from the table. 3, the incidence of VES was less in the group of patients receiving fosinopril + high doses of heparin with propranolol, cytomac, and PCI.

High doses of heparin with propranolol, cytomac, fosinopril, and PCI made the most pronounced effect on the paired, volley, and early VES, as a result of which they were not recorded. Table 3.

There were no significant differences in the clinical condition of patients on the 1st day. Acute heart failure was found in one patient in the 1st and 2nd in the 2nd group. In group 1, restenosis, recurrence of MI, and mortality were not observed.

In the group of patients who underwent PCI only (group 2), recurrence of MI was observed in 9.5% of patients. 19.1% of patients developed restenosis of a heart attack - associated artery according to repeated coronary angiography, ECG by ST segment elevation and repeated anginal pain. 9.5% of patients died. One died in the first 12 hours of PCI, the other 72 hours after the onset of the symptom of restenosis.
| Indicators | PCI (n = 21) | Fosinopril + heparin + propranolol + cytomac (n = 21) |
|------------|-------------|----------------------------------------------------|
| EDV, ml    | 165.10 ± 65.90 | 150.11 ± 67.89 |
| ESV, ml    | 53.20 ± 24.30 | 47.00 ± 23.80 |
| EF, %      | 45.40 ± 3.4 | 41.00 ± 3.1 |
| SBP, mmHg | 142.4 ± 44.8 | 134.2 ± 16.1 |
| DBP, mmHg | 84.9 ± 17.3 | 75.1 ± 16.3 |
| Heart rate, bpm | 75.1 ± 7.0 | 72.0 ± 8.9 |
| SI, ml/m² | 142.4 ± 44.8 | 134.2 ± 16.1 |

**TABLE 2:** Dynamics of indicators of central hemodynamics and AMP in patients with STEMI working in environmentally stressful conditions.
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| Gradation | Fosinopril + heparin + propranolol + cytomac | PCI (n = 21) | p |
|-----------|------------------------------------------|--------------|---|
| abs. %    | abs. %                                   |              | ---|
| 1         | 13 59,1                                 | 16 72,9      | 0,05|
| 2         | 14,3                                    | 17 77,3      | 0,01|
| 3         | 47,6                                    | 20 90,9      | 0,01|
| 4 a       | 0                                        | 19 90,5      | 0,001|
| b 4       | 0                                        | 20 90,9      | 0,001|
| R/T       | 0                                        | 3 14,3       | 0,001|

Thus, our results show that the effect of combined drug and mechanical recanalization of the coronary arteries both on the degree of ecoendotoxicosis - SMP, VES, and LV function, the clinical course during the observation of MI is highly effective.

4 | DISCUSSION

As is known, in STEMI with a Q wave, the volume of damage, impaired LV systolic and diastolic functions begin to expand from the first hour, which contribute to the development of heart remodeling, cardiogenic shock, heart failure, electrical myocardial instability and mortality [1, 6, 14, 18]. In recent years, it has been established that with environmental endotoxicosis, hypoxia in the peri-infarction zone deepens, myocardial metabolism is disrupted, the volume of the lesion, which contribute to the disruption of LV systolic and diastolic functions, is expanded [1, 16]. It is known that LV systolic and diastolic functions that contribute to the development of various complications, in particular HF, myocardial electrical instability, cardiogenic shock, heart remodeling and mortality are proportional to the degree of ecoendotoxocosis [1] and the volume of myocardial damage [6, 18]. In this regard, the search for new drugs and methods for the prevention of these complications and improve the prognosis of NSTEMI remains an urgent problem of cardiology [1, 5, 14, 16].

For this, thrombolytic therapy and angioplasty (PCI) of the affected coronary vessel have been used in recent years [5, 6, 11, 12]. However, in the treatment of thrombolytic drugs, arrhythmia and reperfusion syndrome often appear [1, 12, 17]. After drug reperfusion, it continues with the bodies from the next week [1, 10, 12]. There is evidence that standard PCI performed immediately after successful thrombolysis increases the incidence of complications such as AHF, restenosis, and recurrence of myocardial infarction [6, 10]. The failure of treatment of myocardial infarction with ecoendotoxicosis is due to the inadequate assessment of the severity of endotoxemia associated with the peri-infarction zone [1]. Therefore, in the treatment of myocardial infarction, especially in patients working in environmentally stressful conditions, it is necessary to pay attention to the degree of ecoendotoxicosis - the level of AMP. The AMP is studied to determine the degree of ecoendotoxicosis and generally toxicosis in the body. [4] The average peptide molecule is a marker of ischemic toxin, which worsens circulation, has a toxic effect on cardiomyocytes, promotes the spread of the ischemic zone [1, 2, 5]. In addition, with ecoendotoxicosis in the body increases AMP, which inhibits the biosynthesis of proteins, inhibits the activity of several enzymes, oxidation and phosphorylation are separated, synthesis of adenine acids is inhibited and glucose utilization processes [7].
Restoring coronary blood flow using the integrated use of drugs with mechanical revascularization improves the local kinetics of segments with a sleeping myocardium in the peri-infarction zone [9, 10, 15] and reduces the level of AMP [1].

Available clinical data and the results of our studies show that the use of β-blockers, in particular propranolol [1], metoprolol succinate a [9, 14] before PCI and coronary artery bypass grafting are considered as an important component of myocardial protection and reduce mortality in patients with this category [1, 8]. However, due to hypotension and negative inotropic and other actions, they were used only in 20-35% of patients [1, 6, 9]. On the contrary, according to the literature [6, 9, 14] and our experience, when taking into account reasonable contraindications, the use of β-blockers (propranolol) does not give a negative effect [1, 14]. In addition, in recent years, much attention has been paid to the use of ACE inhibitors [1, 7, 9, 18] in order to prevent the development of post-cardiac remodeling of LV, HF during the observation of MI. One of the last representatives of ACE inhibitors is fosinopril, which is widely used for hypertension and CHF. Due to the lack of information on the complex use of high doses of heparin, propranolol, cytomac, fosinopril and PKI in the early stages of AMI and to resolve this issue, we conducted a number of studies and obtained good results. The introduction of high doses of heparin + cytomac + propranolol infusion and the administration of fosinopril in the early stages of anterior STEMI have a high therapeutic effect and give grounds to consider their use to reduce the degree of ecoendotoxicosis, lesion volume, and left ventricular dysfunction pathogenetically substantiated.

In developing MI using β-adrenergic blockers (propranolol), anticoagulants (high doses of heparin) and antiplatelet agents, it is possible to reduce AMP and maintain the viability of the peri-infarction zone, thereby preventing the expansion of the necrosis zone and the development of various complications. According to the literature [1, 7, 18], in the early stages of MI, fosinopril gives a good therapeutic effect. The results of our studies show that the combined use of high doses of heparin, a cyto-reduction of ecoendotoxicosis, prevents myocardial remodeling and gives a positive hemodynamic effect [1, 18]. Similar data were obtained by other researchers [9, 15]. The best positive effect was recorded in patients with arterial hypertension with less ecoendotoxicosis. Our results (1), as well as the results of other authors (2) indicate that the use of fosinopril reduces the fluctuations in blood pressure and blood pressure and, together with propranolol, stabilizes blood pressure without leading to critical hypotension, and slowly reduces and stabilizes blood pressure and blood pressure d., promotes favorable hemodynamic conditions for LV functioning. The combined use of fosinopril with propranolol, which reduces myocardial detachment in oxygen, stabilizes the membranes of cardiomyositis, reduces the level of free fatty acids, SMP in the peri-infarction zone and intact myocardium, helps to reduce dysfunction of LV systolic and diastolic, restores MI.

It was found that LV dilatation, indisturbed by MI, in depends on the magnitude of the lesion and the degree of ecoendotoxicosis. The decrease in global LV contractility is also indirectly associated with the degree of ecoendotoxicosis, ischemia and myocardial damage [1, 7, 11]. D. Poldermans et al. (16zavis) showed that the survival rate of patients after MI depends on the volume of FDV, FSV and LVEF. The results of our studies indicate the positive effect of the combined use of fosinopril, cytomac, propranolol and PCI on the volume of production, the level of AMP, the processes of early post-infarction LV remodeling. The results show that the use of high doses of heparin, propranolol, cytomac, fosinopril and PCI in the early stages of myocardial infarction reliably reduces AMP from the first day, decreases ESV, EDV, LCVİ, increases EF, SV, SI. In the 1st group of EF, the observation period significantly increased and amounted to 61.9%, in the 2nd - 54.3%.

Global systolic contractility increased significantly in the group treated with high doses of heparin with propranolol in place with cytomac, fosinopril and PCI. At the same time, in the 2nd group it increased unreliably. During the observation period, INLS in the 1st group decreased by 58.5%, in the 2nd - 50, 5%.

Thus, as our studies show, cytomac, propranolol with heparin, improving the rheological properties of
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blood, increasing lymph flow in the peri-infarction zone [1], removes AMP-blood supply to the myocardium. The combined use of fosinopril and PCI improves the systolic function of the left ventricle, increases the indicators of SI, SV, EF, stabilizes SBP, DBP, heart rate, favorably affects the clinical course of the disease.

In group 1, when recording an ECG on magnetic tape, monotonoplic extrasystoles were recorded in 13 (59.1%) patients, polytopes in 3 (14.3%), frequent in 10 (47.6%). In the 2nd group of patients who underwent only PCI, the so-called “threatening” VES were recorded, in particular polytopic, paired, salvo (three in a row or more), or short paroxysms of ventricular tachycardia in 20 (90.9%) patients rare monotonopic VES – 16 (72.9%) Table 3.

5 | CONCLUSION

1. In both groups of patients working in environmentally challenging conditions, there is a high degree of ecoendotoxicosis (0.58+ 0.03 standard units and 0.59+ 0.06 in the next unit, respectively).

2. In the group of patients working in environmentally challenging conditions, who received high doses of heparin, propranolol, cytomoc, fosinopril and PCI (group 1), in the early stages STEMÍ decreased AMP by 58.6%, in group 2 by 22.1%, stabilization of central hemodynamics, a decrease in systolic and diastolic LV functions were noted.

3. With the integrated use of medication with PCI in the early stages STEMÍ in patients working in environmentally challenging conditions, the clinical course of the disease was more favorable: recurrence of MI, restenosis in a heart attack-related coronary artery, and mortality were not observed. 4.9% of patients developed AHF. Monotonopic extrasystoles were recorded in 59.1% of patients, polytopic extrasystoles - in 14, 3%, frequent - in 47, %, paired, volley VES (three consecutive or more) or short paroxysms of ventricular tachycardia were not recorded.

4. In the group of patients where only PCI was used, 9.3% of patients had AHF and 7.8% of patients had recurrent MI; 17.5-restenosis of a heart attack-related coronary artery; 9.3% have mortality. In 90.9% of patients, the so-called “threatening” VES were recorded, in particular polytopic, paired, salvo (three in a row or more), or short paroxysms of ventricular tachycardia, in 72.9% of patients there were rare monotonopic VES, in one (4, 8%) of the patient - R/T.

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