

# Diagnosis Of Small Myocardial Injuries After Percutaneous Coronary Interventions

Kodirova G.I., Tashtemirova I.M., Uzbekova N.R., Usmonov B.B., Bektashev I.B.

Andijan State Medical Institute

**Abstract:** *Observational studies involving a large number of patients confirm that H B is a highly effective procedure with a low complication rate compared to other methods of myocardial revascularization*

**Keywords—***performed worldwide, Observational studies, tamponade, small myocardial injuries.*

## 1. INTRODUCTION

Cardiovascular diseases are currently the main cause of disability and premature death of residents of economically developed countries.

Coronary heart disease (CHD) remains the most common disease today, despite the high level of development of worldmedicine[1, 4].

Treatment of CHD in patients is an urgent problem at the present time. Annually in More than 3.0 million myocardial revascularization procedures are performed worldwide. In recent years, the ratio of percutaneous coronary interventions (H B) (angioplasty and stenting of the coronary arteries) and coronary bypass surgery is 2: 1 in countries Europe, and 6: 1 - in the USA, Japan.

Observational studies involving a large number of patients confirm that H B is a highly effective procedure with a low complication rate compared to other methods of myocardial revascularization. However, in the problem HB there are still many open questions[2, 3, 6].

Today, they have been studied and described in sufficient detail, according to the classification ACC / ANA complications after H B, such as: death, myocardial infarction, stroke, transient ischemic attack, complications at the puncture site, renal failure, allergic reaction to contrast agent; specific complications -coronary artery thrombosis, its perforation, tamponade and arrhythmias. The term "small myocardial injuries" (MPM) appeared in the literature relatively recently. MPM occurs in 8-15% of cases after planned PCI and they are manifested only by an increase in the level of cardiospecific markers, without clinical and electrocardiographic signs of myocardial damage[2, 3, 5].

## 2. The purpose of the study.

To optimize the diagnosis, identify risk factors for the development of small myocardial injuries and assess their impact on the long-term results of planned percutaneous coronary intervention in patients with coronary heart disease: angina pectoris.

## 3. Materials and methods of research.

The study included 45 patients with CHD: angina pectoris FC III-IV, admitted to the Namangan Cardiology Center for planned PCI and coronary artery stenting, selected according to the inclusion and exclusion criteria. The patients included in the study were divided into groups

according to the level of cardiospecific markers in the blood serum: the study group consisted of 25 patients (13 men, 12 women) with CHD angina pectoris. III-IV functional classes after PCI, complicated by small myocardial injuries; comparison group - 20 patients (12 men, 8 women) with coronary artery disease: angina pectoris III-IV functional classes after PCI, not complicated by MPM.

All patients with coronary artery disease (groups compare and research) received the same drug therapy, which included: bisoprolol, trombas, perindopril, atorvastatin, clopidogrel. Patients also continued to receive the recommended therapy at the outpatient stage of treatment.

During PCI and coronary artery stenting, metal stents and drug-coated antiproliferative stents were used. General clinical research methods were used during the study (general analysis of blood, urine), biochemical analysis of blood (blood analysis for blood electrolytes, lactate dehydrogenase, aspartate dehydrogenase, creatinine, urea, Prothrombin index, International normalized ratio, total cholesterol, triglycerides, Glucose) and special research methods-immunochemical blood analysis (troponin T, creatine phosphokinase-MV, myoglobin). Instrumental methods of research were also used: electrocardiography (ECG), Daily holter ECG monitoring, echocardiography and selective coronary Angiography.

Statistical analysis of the data was performed using descriptive statistics methods, Clustering, sample comparison, regression, frequency and correlation Analysis (Pearson correlation coefficient). Data processing was carried out with The use of the application, version 6.0.

## 4. The results of the research.

In the examination of patients with coronary heart disease: angina Pectoris of functional classes III-IV, subjected to PCI and stenting the coronary arteries, in 1 day revealed the presence of complaints in the study group on Minor discomfort behind the breastbone at 3.2% of the patients had any complaints, the The patients in the comparison group complaints did not show ( $p < 0.05$ ).

In patients with CHD study group and comparison after they have PCI and Stenting of the coronary arteries, the biochemical analysis of blood, such As: hemoglobin, creatinine, cholesterol-no differences were found. However, there is An increase in the general blood test of the level of

white blood cells above the norm  $-10.23 \times 10^9 / l$ , in patients of the study group, which is not observed in patients of the comparison group ( $p < 0.05$ ).

**Table 1**

**Comparative frequency of changes in the main clinical and instrumental signs in the studied groups (in%)**

№	Investigated parameters	Study group (n=25)	Group comparisons (n=20)
1	Complaints of minor discomfort the breastbone after PCI	3,2%	not observed
2	The level of the content of leukocytes in the blood	$10.23 \times 10^9 / l$	$6,5 \times 10^9 / l$
3	Early Left Ventricular Repolarization heart on an ECG	17,1%	not observed
4	Dynamics of the ST segment on the ECG	not observed	not observed
5	Dynamics of the ejection fraction echocardiography	not observed	not observed
6	Violation of global and local contractility during echocardiography	not observed	not observed

Instrumental data for the detection of MPM are insignificant - they include ECG-signs in the form of early ventricular repolarization, which are recorded only in the study group (17.1%) after planned PCI ( $p < 0.05$ ) (table 1). There were no differences between the groups of patients in terms of echocardiography (Table 1).

**Table 2**

**Cardiospecific markers in the studied groups (ng/ml)**

№	Investigated parametrs	Comparison group (n=20)	Group research (n=25)
1	Troponin T	$0.0030 \pm 0.004$	$0,074 \pm 0,005$
2	Myoglobin	$70,0 \pm 2,7$	$95,1 \pm 38,59$ ng/ml
3	KFK-MV	$4,94 \pm 0,1$	$5,58 \pm 0,24$ ng/ml

When analyzing the data, the study group showed an increase in the level of myoglobin in the blood serum compared to the study group of 2.5 On The 1<sup>st</sup> day after PCI and coronary artery stenting, there was an increase in the level of CPK-MV in the blood serum in patients of the study group, Exceeding the indicators of the comparison group by 1.7 times ( $p < 0.05$ ). We obtained data on the excess of the

troponin T content in The study group over the comparison group by 74 times ( $p < 0.05$ ). When considering the statistical conjugacy of the studied. Cardiospecific markers of myocardial damage in the study group, it was possible to To identify the average positive correlation between the levels of Myoglobin and CPK-MV ( $r = 0.7693$ ,  $p = 0.0001$ ), as well as between the indicators of myoglobin and Troponin T ( $r = 0.6021$ ,  $p = 0.001$ ). The data obtained indicate the presence of MPM in Patients of the study group.

Step-by-step regression analysis performed for The analysis of cardiospecific markers of myocardial damage revealed a stable linear Relationship between the studied markers and the clinical manifestations of MPM. So As, myoglobin has a direct effect on the formation of troponin T values, while CPK-MV has an indirect effect on the Formation of troponin T values. Using the indicators of the level of troponin T determined in the blood serum Of patients with CHD after PCI and coronary artery stenting, by Immunochemical examination, it is possible to determine the value of myoglobin, using Linear regression equation, with further detection of the development of MPM Individually in each patient. Also, using the linear equation obtained during regression analysis, it is possible To calculate the second cardiospecific marker of myocardial damage-troponin T – from the values of the CPK-MV index determined by immunochemical Examination of the blood serum of patients with CHD. The correlation coefficient is:  $g = 0.53366$ . The obtained linear regression equations show a more important role of the relationship between the Increase in cardiospecific markers, such as: myoglobin, troponin T and CPK-MV in response to the occurrence of small myocardial injuries after percutaneous Coronary interventions and stenting of the coronary arteries, which can serve as an Algorithm for detecting this complication. On the 1<sup>st</sup> day after percutaneous coronary interventions and Coronary artery stenting in patients with CHD at the level of troponin T  $0.030 - 0.072$  ng / ml, CPK-MV  $0.10 - 4.94$  ng / ml, myoglobin  $25.0 - 72.0$  ng / ml is predicted Favorable clinical course of the postoperative period without the development of small myocardial injuries; and at the level of troponin T  $0.030 - 0.072$  ng / ml, CPK-MV  $4.94 - 5.58$  ng / ml, myoglobin  $72.0 - 93.6$  ng / ml is predicted as an unfavorable Course of the postoperative period with the development of small myocardial injuries [6].

### 5. Conclusions

Clinical peculiarities of the early postoperative Period in patients with ischemic heart disease, 1 day after the planned Percutaneous coronary intervention in patients with the development of small damage Of the myocardium, in contrast to the comparison group, is the presence of a minor Discomfort behind the breastbone (17.1 percent), increasing levels of leukocytes in the blood ( $10.23 \times 10^9 / l$ ), early repolarization syndrome of the left ventricle of the heart on an ECG (3.2%) ( $p < 0.05$ ). The increase in levels of cardiospecific markers in the serum blood: myoglobin ( $95,1 \pm 0,55$  ng/ml), troponin ( $0,074 \pm 0,002$   $\mu$ g/ml), creatine phosphokinase-MB ( $5,58 \pm 0,089$  ng/ml) in patients with

coronary artery disease: angina voltage functional class III-IV after implementation of percutaneous coronary interventions with a high probability testify to the development of their small damage to the myocardium. Risk factors that allow predicting the development of small myocardial injuries after percutaneous coronary intervention and coronary artery stenting in patients with coronary artery disease are: diffuse coronary artery disease, stenosis length greater than  $24.07 \pm 1.3$  mm, recanalization with stenting coronary arteries, lateral branch occlusion, implantation of metal stents, implantation of two or more stents, systemic atherosclerosis, diabetes mellitus type 2, blood giperfagiya ( $p < 0.05$ ). An increase in the level of cardiospecific markers due to the development of small myocardial injuries adversely affects the long-term (1 year of follow-up) results of percutaneous coronary intervention, leading to the return of angina pectoris (2.86%) and the need for repeated hospitalizations (5.71%).

#### 6. References

1. Chazov E. I. Ischemic heart disease and the possibility of improving the effectiveness of its treatment. Forum. Ischemic heart disease 2000; No. 1: pp. 2-5.
2. Gayrabekova F. R. Dynamics of troponin T in blood serum in patients with ischemic heart disease before and after coronary artery stenting/ F. R. Gayrabekova, M. A. Chichkova // Modern high-tech technologies. - 2012.- No. 5. - pp. 5-7.
3. Gayrabekova F. R. Dynamics of acute phase response as a diagnostic marker syndrome of "small myocardial injuries" before and after stenting of coronary arteries /F. R. Gayrabekova, Yu. M. Chichkov // Cardiovascular diseases. -2013. - Volume 14. -No. 6. - P. 283.
4. Atherosclerosis. Secondary prevention of atherothrombosis after surgical treatment of CHD. Educational-methodical manual/ M. A. Chichkova, F. R. Gairbekova, V. N. Meshcheryakov, E. A. Belova. - Astrakhan: Publishing House "Astrakhan State Medical Academy academy", 2012. - 216c.
5. Akarasereenont P., Nuamchit T., Thaworn A. et al. Serum nitric oxide levels in patients with coronary artery disease. J. Med. Assoc. Thai. 2001; 84 (suppl. 3): S730-S739.
6. Chazov E. I. The problem of treatment of patients with coronary heart disease. Therapeutic archive 2009: No. 9: pp. 5-9.
7. Metelitsa V. I. New in the treatment of chronic ischemic heart disease., Moscow, 1999, 209 p..