



## Evaluation of the effectiveness of thrombolytic therapy in men with acute coronary myocardial infarction in young age

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**ABSTRACT:** The effectiveness of systemic administration of TLP in the acute period of myocardial infarction was studied and the effect of these drugs on the dynamics of myoglobin (MG) was studied in order to further predict the course of the acute period of myocardial infarction. The study included 126 patients aged 18 to 45 years. The average age of the patients was  $31.5 \pm 5$  years. Among these patients, TLT was performed in 72 patients with AMI who were admitted to the cardiac intensive care unit of the SF RSCEMP in the first 6 hours of illness.

**KEYWORDS:** thrombolytic therapy, acute myocardial infarction, young age, streptokinase, myoglobin.

### INTRODUCTION

Cardiovascular diseases rank first in the general structure of pathology and are the cause of premature death among the population in more than 60% of cases. Cardiovascular accidents (unstable angina pectoris (NS), acute myocardial infarction (AMI)) are especially dangerous because of their sudden onset, which is often accompanied by the development of life-threatening complications. Therefore, it is worth starting a highly qualified treatment as soon as possible, since the greatest losses occur precisely in the first 2 hours of the disease [1,3].

AMI has remained the leading nosological form in the structure of ischemic heart disease for many years [5,7,11]. More than 15 million new cases of AMI are noted in the world every year [2,5]. AMI largely determines mortality and labor losses in most countries of the world. AMI is also the main cause of sudden cardiac death. AMI is a condition of developing thrombosis that occurs when an atherosclerotic plaque of a coronary artery ruptures. The clinical picture largely depends on the

characteristics of the nature of the violation of the patency of the coronary artery [2,3,5]. With a spasm of the coronary artery or the formation of a platelet aggregate, unstable angina develops. With the formation of a parietal red thrombus, an AMI without a Q wave develops, with the formation of an obstructing red or mixed thrombus, occlusion of the coronary artery occurs and a transmural AMI with a Q wave develops [4,7].

The main achievements of medicine in the second half of the twentieth century, which made it possible to reduce hospital mortality in AMI patients from an average of 25-30% to 8.4%, were the creation of specialized intensive care units equipped with tracking and resuscitation equipment, widespread introduction since the early 90s. thrombolytic therapy (TLT) and the development of endovascular treatments [1-3].

Thrombolytic drugs, which today are the main ones in the treatment of AMI, have made it possible in leading clinics in the world to reduce mortality from this disease to 7% and even to 5%. Therefore, one of the most important stages in the treatment of acute occlusive coronary thrombosis is the rapid and complete restoration of coronary blood flow and ensuring adequate myocardial perfusion. Thrombolytic drugs are used to dissolve the thrombus occluding the artery, and various classes of antithrombotic agents are used to maintain the patency of the coronary artery: drugs that affect platelet function and inhibit the key coagulation enzyme thrombin [6,8].

The world's first successful introduction of a thrombolytic drug (fibrinolysin) into the coronary artery was carried out by E.I. Chazov et al. in 1975 and showed that drugs in this group reduce the volume of myocardial damage, contribute to a faster recovery of ECG indicators. Subsequently, the efficacy of thrombolytic drugs (streptokinase - SK, tissue plasminogen activator - TAP, streptokinase complex with acylated plasminogen - SCAP) in relation to the survival of patients with MI in comparison with placebo was proved. It has been proven that it is possible to reduce mortality in AMI by 20% in conventional cardiac intensive care units with intravenous SC administration. Studies carried out later demonstrated a comparable effect on mortality in AMI of all the above thrombolytics [7,10].

Most controlled clinical trials show a linear relationship between time to treatment initiation and mortality rates. This is the reason for the desire to accelerate the initiation of thrombolytic therapy (TLT) by 1–2 hours in comparison with the current recommendations. It is estimated that thrombolysis within 1 hour from the onset of myocardial infarction symptoms not only helps to reduce mortality, but in 40% of patients interrupts the development of myocardial infarction, and also prevents the development of irreversible myocardial damage, its dysfunction and sudden death, more than half of which occur in first hours of MI. Thus, the speed of AMI diagnosis is a determining factor. It is very important to start thrombolysis (in the absence of contraindications) in the 1st hour from the onset of MI symptoms (the so-called “golden” hour) [9,13].

TLT is included in the list of standard measures for large-focal MI. It is believed that when used in the first 6 hours from the onset of myocardial infarction, it saves potentially necrotic myocardium, improves left ventricular function and, most importantly, reduces mortality from MI [11].

It was noted that patients under 45 years of age admitted to hospital with AMI were not previously observed by doctors [8]. According to a number of studies, patients with AMI at a young

and middle age maintain high levels of up to hospital (up to 36-50%), hospital mortality (15-16%) and its share in the first day of treatment in a hospital is about 40.4% [1, 7]. Up to 50% of deaths in patients with AMI occur in the first 1.5–2 hours from the onset of an anginal attack, a significant proportion of patients die before the arrival of an ambulance team [12, 14].

As a rule, in young people AMI is preceded by a short ischemic history [9]. Foreign studies have shown that only 24% of young patients before the onset of this coronary event sought medical help in connection with angina pectoris, 69% of patients younger than 45 years old had no previous chest pain [11]. The duration of the angina clinic in most of the young patients was observed for several days, and signs of myocardial damage on the electrocardiogram (ECG) were detected immediately after the painful attack [13,15].

To date, the most vulnerable contingent of patients who die before admission to hospitals are those under 50 years old [6, 7], since this part of the population is the labor and intellectual potential of society [10]. The main reasons for these phenomena are considered to be the low efficiency of measures for primary and secondary prevention of coronary artery disease, as well as problems of diagnosis and treatment [11-14].

**Objective:** To study the effectiveness of systemic administration of TLP in the acute period of myocardial infarction and to study the effect of these drugs on the dynamics of myoglobin (MG) in order to further predict the course of the acute period of myocardial infarction.

**Materials and methods of research:** The study included 126 patients aged 18 to 45 years. The average age of the patients was  $31.5 \pm 5$  years. Among these patients, TLT was performed in 72 patients with AMI who were admitted to the cardiac intensive care unit of the SF RSCMP in the first 6 hours of illness.

The diagnosis of AMI was verified on the basis of clinical and instrumental data: 1) the presence of characteristic complaints; 2) clinical picture; 3) ECG changes in ST segment elevation more than 1 mm in at least 2 leads.

**Research result:** Depending on the treatment, 2 groups were identified: main and control. The main group included 72 patients with MI who received TLT. A history of MI was noted in 5 (6.90%) patients, AH in 11 (15.2%), arrhythmias in 13 (8.1%) patients. Predominantly anterior localization was observed in 12 (16.6%) patients, posterior in 16 (22.2%) patients, in 22 (30.6%), the lesion of the heart muscle was transmural.

The control group included 54 patients in whom thrombolytic drugs were not included in the treatment. The average time of admission from the onset of clinical manifestations of MI is  $4.15 \pm 2.09$  hours. The average age of patients in the control group was  $34.9 \pm 1.5$ . In the anamnesis, 10 (18.5%) patients had indications of hypertension. 20 (37%) patients had MI, 8 (14.8%) had arrhythmias. Anterior localization of the necrosis focus was detected in 13 (24.1%) patients, posterior in 31 (57.4%). In 10 (18.5%), myocardial damage, according to ECG data, was transmural in nature.

In general, the patients of the main and control groups are similar in clinical and anamnestic characteristics, the localization of myocardial infarction and the time of admission to the hospital, which later allowed making certain conclusions about the effectiveness of TLP in patients with myocardial infarction. The study did not include MI patients who had clinical signs of cardiogenic shock, pulmonary edema, or contraindications to TLT. Blood for the study was taken before

streptokinase administration, and then every 3 hours on day 1, on day 2 every 12 hours, once on days 3, 5, 7 and 10. After the end of TLT, heparin was prescribed under the control of hemostatic parameters.

Patients in the control group received heparin in a daily dose of 20 thousand units. per day. In the case of successful thrombolysis, there was a decrease in the frequency of relapses of anginal pain by 1.4 times, the number and severity of rhythm disturbances by 1.7 times, as well as a decrease in the manifestations of decompensation by the 7 th day by 1.8 times in the main group compared to the control group. Based on the criteria described above, the patients of the main group were divided into subgroups 1a and 1b with successful and unsuccessful TLT, differing both in clinical signs and in the data of instrumental examination methods. Relapses of pain syndrome were observed in 5 (6.9%) and 4 (7.4%) patients, arrhythmias of various classes were recorded on the 1st day in 8 (11.1%) and 2 (3.7%), with 2 x days, circulatory failure was observed in 11 (15.2%) and 5 (9.3%). By the 7th day, local contractility disorders were observed in 8 (11.1%) and 5 (9.3%) patients, respectively. There was no lethal outcome in the subgroup.

The kinetics of necrosis markers in patients from the study and control groups showed that the maximum MG activity in the study group was reached by 6:00, while in patients from the control group, the maximum increase in MG levels occurred by 9 hours from the start of therapy. Moreover, over the course of 5 days, the levels of MG in both groups significantly differed from the control group, and this difference remained on the 10th day. An accelerated achievement of the peak concentration of MG in the blood of 1a and 1b subgroups of the main group was observed in patients with successful TLT.

Thus, the maximum level of MG in subgroup 1a was reached by 6 hours and was  $1481.3 \pm 197.0$  ng / ml, and at 16-1638.9  $\pm 180.1$  ng / ml by 9 hours, on the 10th day the level of MG was normalized in patients with successful TLT, while in patients with unsuccessful TLT, the MG level remained elevated. However, patients of the 16th subgroup and the control group more often had "recurrent" and "protracted" MG release curves, which is possibly related to the phenomenon of their "washing out" from the focus of myocardial necrosis during coronary reperfusion. The results obtained confirm that the onset of reperfusion in patients in the first hours of MI can be based on the analysis of the dynamics of MG concentration in the blood serum.

### Conclusions:

Thus, in patients who received TLT, there was a decrease in the frequency of relapses of anginal pain by 1.4 times, the number and severity of rhythm disturbances by 1.7 times, as well as a decrease in the manifestations of decompensation by 7 days by 1.8 times in the main group compared to with the control. MG in subgroup 1a was achieved by 6 o'clock and was  $1481.3 \pm 197.0$  ng / ml, and at 16-1638.9  $\pm 180.1$  ng / ml by 9 o'clock, on the 10th day the MG level returned to normal in patients with successful TLT, while in patients with unsuccessful TLT, MG levels remained elevated.

## LITERATURE:

1. Andrenko E.Yu., Yavelov I.S., Lukyanov M.M., Vernokhaeva A.N., Drapkina O.M., Boytsov S.A. Ischemic heart disease in young people: prevalence and cardiovascular risk factors. *Cardiology*. 2018; 58 (10).
2. Botasheva, V.S. Pathological anatomy of acute myocardial ischemia / V.S. Botasheva, L.D. Erkenova, F.A. Barotov // *Medical alphabet (Cardiology)*. - 2016. - T. 2, No. 28. - S. 22-24.
3. Coronary artery disease associated with factor V Leiden mutation: a case report / Roberto Muniz Ferreira [et al.] // *Turk Kardiyol Dern Ars.* – 2019. – Vol. 47 (2). –P. 148–152.
4. Diagnostics and treatment of patients with acute myocardial infarction with elevation of the ST segment of the electrocardiogram (part 1). Recommendations Society of Specialists in Emergency Cardiology. *Urgent cardiology* 2014; (1): 43–62.
5. Khasanjanova F.O., Khaydarova D.D., Muradova R.R., Nuralieva R.M., Nasirova D.A. Clinical, hemodynamic and genetic aspects of the development of unstable variants angina in young men. *European Journal of Molecular and Clinical Medicine* Volume 07, Issue 09, 2020. P. 2122-2139.
6. Khasanjanova, F.O., & Tashkenbaeva, E.N. (2018). The role of changes in markers of cardiomyocyte necrosis in patients with myocardial infarction, depending on age. *Actual scientific research in the modern world*, (10-6), 42-45.
7. Khasanjanova, F.O., & Tashkenbaeva, E.N. (2019). Unfavorable risk factors affecting the outcome of treatment of patients with acute coronary syndrome with ST elevation. *Avicenna*, (34), 4-6.
8. Khasanjanova, F.O., Mardonov, U.A.U., & Yusupov, T. Sh.U. (2019). Factors adversely affecting the outcome of treatment of patients with acute coronary syndrome in young and old age. *Problems of modern science and education*, (11-1 (144)).
9. Khasanjanova F.O., Sunnatova G.I., Madjidova G.T. Adverse risk factors the treatment of the treatment of patients with acute coronary syndrome with elementation of ST segment. *Science, Research, Development* #33. Paris 29-30. 09. 2020 y/ P. 62-64.
10. Maroszyńska-Dmoch, A. M. Clinical and angiographic characteristics of coronary artery disease in young adults: a single centre study / A. M. MaroszyńskaDmoch, B. Woźakowska-Kapłon // *Kardiologia Pol.* – 2016. – Vol. 74 (4). – P. 314–21.
11. Ponomarenko IV Acute coronary syndrome in young patients: clinical features and risk factors. 2019. - p. 13.
12. Risk factors for coronary artery disease and acute coronary syndrome en patients ≤ 40 years old / H. Alkhawam [et. al.] // *Future Cardeol.* – 2016. – Vol. 12 (5). – P. 545–52.
13. Samadova N.A, Tashkenbaeva E.N, Madjidova G.T, Haydarova D.D. Clinical and Diagnostic Features of Myocardial Infarction in Young Patients in Emergency Medicine. *International Journal of Academic Health and Medical Research (IAHMR)* ISSN: 2643-9824 Vol. 4 Issue 10, October – 2020, Pages: 69-71.

14. Tashkenbaeva, E.N., Khasanjanova, F.O., Abdieva, G.A., Sunnatova, G.I., & Mirzaev, R.Z. (2018). Predictors of the development of cardiovascular complications in patients with acute myocardial infarction with ST segment elevation. Science and society in an era of change, (1), 12-15.
15. The state of the coronary bed and the results of endovascular treatment young patients with acute myocardial infarction / RV Zeinalov [et al.] // Svit meditsini te biologii. - 2016. - No. 1 (55). - S. 39-44.

