

## The study of streptokinase efficiency dependent on period of usage in patients with acute myocardial infarction

*Sophio Svanidze, Rusudan Napetvaridze, Irma Mamatsashvili, Tamar Emkhvari*

#3 Internal Medicine Department of Tbilisi State Medical University, Tbilisi, Georgia

### ABSTRACT

The aim of our work was the study of influence of thrombolysis on the course of acute myocardial infarction on hospital stage according to the beginning of treatment. Thrombolytic therapy with streptokinase (SK) was carried out on 120 patients with acute myocardial infarction in cardiological department of #1 clinic of TSMU. Patients received intravenous thrombolytic treatment with 1,5 MU SK during the first 6 hours after infarction. Outcomes of carried out research showed that earlier application of thrombolytic therapy (before 3 h) is more efficient, which was proved by cessation of pain, appearance of CPK high activity in most of I group patients. Ejection fraction of left ventricle is higher in the I group, though difference between I and II groups is not statistically significance. 30-days mortality was significance low in the first group and equaled to 6,4% in comparison with 11,9% in the second and 16% in the III group. 5-year mortality did not differ much in both groups.

**KEYWORDS:** *myocardial infarction, thrombolytic therapy, reperfusion, mortality*

Nowadays thrombolytic therapy is the most efficient and pathogenically proved method of the treatment of acute myocardial infarction [2]. The main factor which determine the final size of myocardial infarction are time before myocardial reperfusion and development of collateral blood circulation. These factors determine treatment tactics aimed on achievement of early and steady reperfusion [1]. Usage of thrombolytic drugs has lowered the mortality from myocardial infarction to 7% or even 5% [4]. Though research showed that mortality differs dependent on time of usage thrombolysis [3,5].

The aim of our work was the study of influence of thrombolysis on the course of acute myocardial infarction on hospital stage according to the beginning of treatment.

### MATERIALS AND METHODS

Thrombolytic therapy with streptokinase (SK) was carried out on 120 patients with acute myocardial infarction in cardiological department of #1 clinic of TSMU. Patients received intravenous thrombolytic treatment with 1,5 MU SK during the first 6 hours after infarction. Assessment of efficiency of thrombolysis was performed by following criteria: cessation or remarkable diminution of pain during 30-40 minutes after starting perfusion of SK, fast ST segment elevation resolution, cropping up of reperfusion arrhythmia, increase of activity of creatinphosphokinase (CPK) by at least 30-40%. During long-term monitoring (5-years) frequency of postinfarctious angina, heart failure, recurring myocardial infarction and mortality were assessed.

Patients were divided into 2 groups. Thrombolytic therapy was applied to the patients of the first group during first 3 h of myocardial infarction, to the patients of the second group - from 3 to 6 h. There were 50 patients in control group without thrombolytic therapy. (Tab.1)

### RESULTS AND DISCUSSION

Before thrombolytic therapy ST segment elevation did not differ in groups and it was respectively  $3,5 \pm 0,6$  mm,  $3,7 \pm 0,8$  mm and  $3,62 \pm 0,64$  mm. After thrombolytic therapy ST segment returned to isoline in 62 (79,5%) patients, in the second group - in 22 (52,4%) patients. In other patients ST segment elevation was  $1,5 \pm 0,4$  mm.

We achieved cessation of pain in all patients in the I group, in 38 (90,5%) patients in the second and in 28 (56%) in the third group.

Study of activity of enzyme CPK showed, that in the I group peak activity was seen after  $12,6 \pm 1,6$  h and equaled to  $2407,3 \pm 8,8$  IU/L and appeared in 59 (75,6%) patients. In the II group peak came after  $17,1 \pm 1,4$  h and equaled to  $1424 \pm 3,6$  IU/L and was seen in 23 (54,8%) patients. In the III group maximal activity of CPK was  $496,7 \pm 5,8$  IU/L.

During reperfusion were registered different types of arrhythmia in 19 (24,3%) patients of the I group, among them 1 (1,3%) had ventricular fibrillation, 8 (10,3%) - had ventricular extrasystole, 6 (7,7%) - supraventricular extrasystole, 4 (5,1%) - AV block. In the II group there were registered arrhythmias in 8 (19,1%) patients, among them 3 (7,1%) - ventricular extrasystole, 4 (9,5%) - supraventricular extrasystole, 1 (2,4%) - ventricular tachicardia. Before discharging from the hospital there was assessed the extent of heart failure by NYHA. Findings are given in the Tab.2.

Study of 30-days mortality showed, that in the I group died 5 (6,4%) patients, in the II group - 5 (11,9%) and in the III - 9 (18%) patients. 5-year mortality in groups was respectively: 8 (11%), 5 (13,5%) and 10 (23,8%).

Outcomes of carried out research showed that earlier application of thrombolytic therapy (before 3 h) is more efficient, which was proved by cessation of pain, appearance of CPK high activity in most of I group patients. Ejection fraction of left ventricle is higher in the I group, though difference between I and II groups is not statistically significance. 30-days mortality was significance low in the first group and equaled to 6,4% in comparison with 11,9% in the second and 16% in the III group. 5-year mortality did not differ much in both groups.

So, while administering thrombolysis during the first 3h of myocardial infarction we are able to decrease frequency of complications and respectively of mortality in comparison with its later usage.

Index	I group n=78	II group n=42	III group n=50
Men	48 – 61,5%	28 – 66,5%	31 – 62%
Women	22 – 38,5%	14 – 33,3%	19 – 38%
Age	66,2±0,9	65,4±1,1	68,1±0,8
Anterior infarction	51 – 65,4%	26 – 61,9%	28 – 56%
Arterial hypertension	50 – 64,1%	27 – 64,3%	34 – 68%
Hypercholesterolemia	56 – 71,8%	28 – 66,7%	38 – 76%
Diabetes mellitus	12 – 15,4%	5 – 11,9%	7 – 14%
Smoking	36 – 46,2%	15 – 35,7%	29 – 58%
Obesity	13 – 16,7%	4 – 9,5%	9 – 18%
Time from the beginning of pain, hours	2,8±0,4	5,8±0,9	-

**Tab.1** Clinical description of patients.

Parameters	I group n=78	II group n=42	III group n=50
Cessation of pain	78 – 100%	38 – 90,5%	-
Activity of CPK	2407,3±8,81	1424±3,6	496,7±5,8
Reperfusion arrhythmia	19-24,3%	8-10,3%	-
Heart failure: NYHA I	-	-	9 – 18%
NYHA II	44-56,4%	12 – 28,6%	17 – 34%
NYHA III	23-29,5%	17 – 40,5%	23 – 46%
NYHA IV	11 – 14,1%	13 – 30,9%	2 – 4%
Ejection fraction	49,2±1,1	45,6±0,9	40,2±0,6

**Tab.2** Clinical description of patients after thrombolytic therapy.**REFERENCES:**

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## Изучение эффективности стрептокиназы в зависимости от срока ее применения у больных с острым инфарктом миокарда

Софио Сванидзе, Русудан Напетваридзе, Ирма Мамацашвили, Тамар Эмхвари

Кафедра №3 внутренних болезней Тбилисского государственного медицинского университета, Грузия

### РЕЗЮМЕ

Целью работы являлось изучение влияния тромболизиса на динамику острого инфаркта миокарда при лечении в условиях клиники с учетом сроков начала лачения. Тромболитическая терапия стрептокиназой (СК) проведена 120 больным острым инфарктом миокарда в кардиологическом отделении №1 клиники ТГМУ. Результаты проведенного исследования показали, что ранняя (до 3-х часов) тромболитическая терапия более эффективна. Это выражается в виде исчезновения болевого синдрома, появления реперфузионных аритмий, раннего снижения сегмента ST и достижения высокой активности СК у большего числа больных первой группы. Фракция выброса левого желудочка выше в первой группе, хотя различие между I и II группами статистически недостоверно. Смертность за 30 дней достоверно низка в I группе и снизилась до 6,4% в сравнении со II (11,9%) и III контрольной группой (16%). Через 5 лет смертность в обеих группах оказалось идентичной. Таким образом, при назначении тромболизиса в течение 3 часов от начала развития инфаркта миокарда, удается снизить частоту осложнений и, соответственно, смертности по сравнению с более поздним его использованием.

**Ключевые слова:** инфаркт миокарда, тромболитическое лечение, реперфузия, летальность