

“Value “symptom-balloon” Time in Acute Myocardial Infarction with ST Elevation Patients to Treatment with Primary Angioplasty with Stenting: Results from Registry of PTCA in Acute Myocardial Infarction of Republican Research Centre of Emergency Medicine, Tashkent, Uzbekistan

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Abstract

Acute cardiovascular pathology is the most common causes of death and invalidism in a modern society, among acute disturbance of coronary circulation-acute myocardial infarction (AMI) occupies the leading place. The most important in treatment of patients with ST elevation AMI (STEMI) at which in 95% of cases is observed full thrombotic occlusion of coronary artery, is restoration of adequate blood flow in arteries and steady maintenance of its tissue perfusion. As known, restoration of an adequate blood flow in infarct-related coronary artery (IRA) by drug management or mechanical way reduces the size of myocardium necrosis, promotes conservation of functional condition of heart, reduces hospital mortality and invalidism in the remote period of observation.¹⁻⁶ Carrying out of emergency PTCA and stenting in early terms of disease provides sufficient blood flow current in the IRA, it limits necrosis zone and prevents development of dilatation and dysfunction of LV.^{2, 8} Last decade numerous researches are carried out and results of the registers comparing efficiency of thrombolytic therapy (TLT) and PTCA at STEMI are analyzed. As a result of comparison of medicamentous and invasive methods of coronary blood flow restoration researchers have come to conclusion that it is necessary to restore coronary blood flow by any accessible way as soon as possible. From the aforesaid the exclusive role of time in successful treatment of patients STEMI becomes clear.

The aim of our work was in a study of clinical efficiency of PTCA and stenting of the IRA in various terms from the symptoms beginning by the retrospective analysis of results of treatment the patients STEMI (*Iranian Heart Journal 2011; 12 (1):45-49*).

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164 patients STEAMI arrived to the Republican Research Centre of Emergency Medicine of the Ministry of Health of the Republic Uzbekistan are included in the study.

from the STEAMI beginning to PTCA was from 6 to 24 hours.

Echocardiography

All patients underwent standard M-mode and 2D echocardiography (ultrasound system Siemens-Sonoline-Omnia) on admission (before PTCA), 7 and

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Cardiologists Society of 2005. In the study all patients who had absolute indications for carrying out of myocardium revascularization

according to recommendations of the European Cardiologists Society were included.⁶ Patients with non-Q wave infarction, onset of symptoms of acute myocardial infarction ≥ 48 h, a history of previous myocardial infarction with proven pre-existing Q waves in at least two adjacent leads, previous coronary artery bypass surgery, cardiogenic shock, congestive heart failure at admission, associated valvular heart disease, known dilated or hypertrophic cardiomyopathy, were not included in the study. Also excluded were patients with left bundle branch block or with permanent ventricular pacing. Vessel patency and flow were graded according to the thrombolysis in myocardial infarction (TIMI) classification.⁷ Depending on time of carrying out PTCA and stenting of coronary artery two groups of patients have been selected. The Group-I included 78 patients at the age from 38 to 67 years (54.4 ± 6.8 year on the average), there were 58 men (74.3%). Time from the beginning of STEAMI to PTCA was < 6 hours. Into Group-II 86 patients of the average age 52.8 ± 1.6 year have been included, there were 64 (74.4 %) men. Time

views. Left ventricular ejection fraction (LVEF), as an index of global LV function, and wall motion score index (WMSI), scored according to the 16 segment model from 1 (normal) to 3 (akinetic) at each segment, were determined by two independent operators blinded to clinical and angiographic data. The clinical characteristic of patients included in the study (Table I).

Table I. Characteristics of the study population

Показатель	Group 1 n-78 [%]	Group 2 n-86 [%]	p
Age, [M \pm SD] years	54,6 \pm 2,8	52,8 \pm 3,6	ns
Sex, male	58 [74.3]	64 [74.4]	ns
Hypertension	42 [53.8]	53 [61.6]	ns
Diabetes	16 [20.5]	20 [23.2]	ns
Infarction-related artery			
LAD	40 [51.3]	43 [50.0]	ns
CA	8 [10.2]	9 [10.5]	ns
RCA	30 [38.5]	34 [39.5]	ns
TIMI – 0	76 [97.4]	83 [96.5]	ns
TIMI – I	2 [2.6]	3 [3.5]	ns

Statistical Analysis

Statistical analysis was carried out by means of tabular processor EXCEL 2007 and programs for statistical data processing STATISTICA 6.1. for WINDOWS XP and medical statistical computer program MedCalc ver. 10.0.1. During the statistical analysis we calculated average indexes with the indication of standard deviation (M \pm SD). Was used statistical significance value not less than 95% (p=0.05).

Results

By the results of angiography at 30 [38.5 %] and 34 [39.5 %] patients (Group 1 and 2 accordingly) there

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was the IRA of the RCA. At 40 (51.3 %) and 43 (50.0 %) patients there was observed a lesion of a LAD and at 8 (10,2 %) and 9 (10.5 %) patients (Group 1 and 2 accordingly) the IRA was the circumflex coronary artery. Thus at 76 (97.4 %) patients in Group 1 and at 83 (96.5 %) in Group II thrombosis of infarct-related coronary artery was accompanied by blood flow TIMI-0, and accordingly at 2 (2.6 %) and 3 (3.5 %) patients the blood flow remained at TIMI-I level. PTCA with the stenting was carried out "ad-hoc" method immediately after angiography. All 164 (100%) patients had primary coronary angioplasty with stenting of the IRA. At 100% of patients in both groups blood flow of TIMI - III degree was restore, and residual stenosis less than 10% that is angiographic criterion of successful procedure.

Echocardiography study of patients has revealed normal parameters of LV and RV volumes on the average by groups, however systolic function of LV has lowered. Data of echocardiography are given in Table II. In Group 1 of patients by 7th day significantly restore of systolic function of LV was observed - EF was increased from 48.2 % to 51.6 % (p value=0.0013), and by 30 day to 54.7 % (p value=0.001). In the second group the tendency to increasing EF LV from 46.1 % to 47.2 % became perceptible (p value=0.2197).

Table II. Echocardiography data in groups

	Day 1		Day 7		Day 30	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
EDV, ml.	131.8±5.2	135.6±2.9	130.7±3.7	133.2±6.0	128.6±2.5	130.1±5.6
EF, %.	48.2±7.1	46.1±5.6	51.6±5.8	47.2±6.1	54.7±4.1	52.1±5.3
WMSI	1.42±0.20	1.49±0.21	1.1±0.05	1.34±0.09	1.07±0.05	1.18±0.1

Similar dynamics was in indicators EDV LV, so in Group-1 on 7 day insignificant reduction from 131.8 ml to 130.7 ml (p value=0.13) became perceptible, and by 30-day was significantly to 128.6 ml (p value=0.0001). In the Group-2 EDV LV has decreased from 135.6 ml to 133.2 ml (p value=0.001) by 7 day, and by 30 day to 130.1 ml (p value=0.0001).

As seen from the Table No II in Group-1 WMSI has significantly decreased from 1.42 to 1.10 (p value=0.0001) by 7 day, and to 1.07 (p value=0.0001) by 30 day of observation. In the Group-2 this indicator by 7 day has decreased from 1.49 to 1.34 (p value=0.0001) and by 30 day to 1.18 (p value=0.0001).

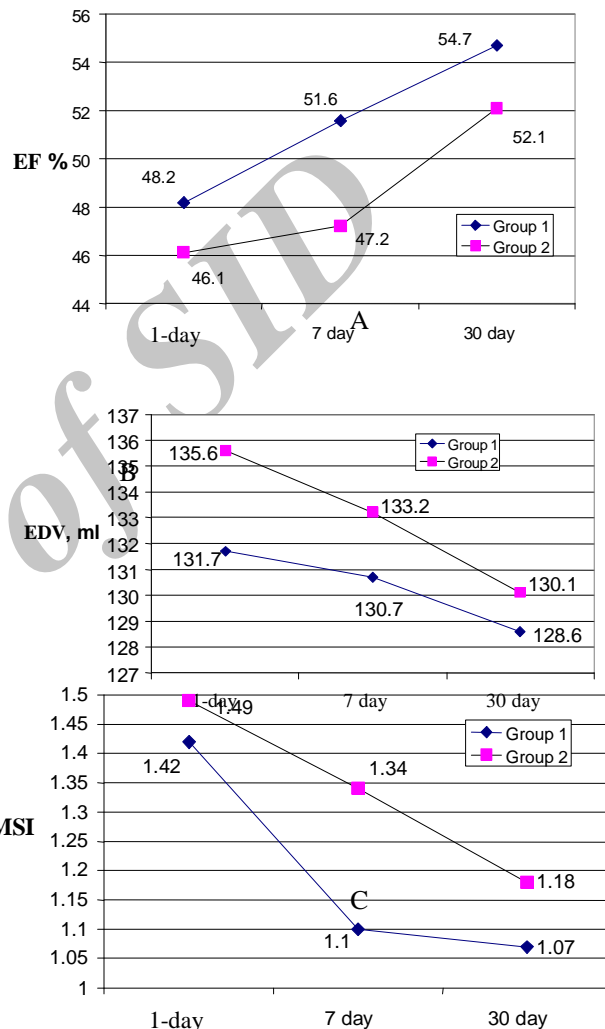


Fig. Changes in LV EF (a) and EDV (b) and WMSI (c) during 1 month in the study population.

Discussion

At acute thrombotic occlusions of a coronary artery irreversible changes in a myocardium appear in 20-30 minutes and finish depending on degree of blood flow reduction, and presence of collateral blood flow in it through 6-24 hours. Maintenance of an adequate blood

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flow to infarct-related coronary artery can limit a zone of myocardium necrosis only during the given period, and with each lost minute the clinical effect of reperfusion dramatically decreases. In this connection in cardiology even there was a concept of "gold hour" for coronary blood flow restoration.

Unfortunately, about 40 % of STEAMI patients arrive in a hospital after 12 hours from the disease beginning. As TLT at such patients is considered ineffective or capable to harm, modern guidelines of STEAMI patients do not support of TLT in this situation.

Nevertheless, there are a number of the facts testify to possible advantage of mechanical reperfusion at late arrived STEAMI patients. First, it is established that the viability myocardium often is available after the 12 hour ischemia. Secondly, in several studies indicated PTCA efficiency after 12 hours from the STEAMI beginning. One of there was multicentral randomized study BRAVE-2 (the Beyond 12 hours Reperfusion Alternative Evaluation) to assess efficiency PTCA with stenting at the patients who have arrived after twelve hours from the beginning of disease.⁹ The given study has shown that at STEAMI patients arrived in 12-48 hours from the disease beginning, coronary stenting considerably limits the necrosis size.

Efficiency of so impressing result of endovascular treatment of patients STEAMI is that even after many hours the reperfusion of damage and necrosis zone allows providing restoration of the most part of the damaged cardiomyocytes. It is proved that even in the basic centre of a myocardial infarction not all cardiomyocytes damage simultaneously. It is characteristic for cases of the ischemia with damage and without Q-wave myocardial infarction, at Q-wave myocardial infarction and in a phenomenon of hibernating myocardium. Reperfusion in a zone of a lesion not only at the first 6 hours but also in the first days, and with regards to peri-infarction zone and in the first weeks, allows saving cells, restore function stunning and hibernating myocardium.

As seen from our study in Group 1 of patients the restoration of LV contractile ability occurred promptly, whereas in Group 2 there is a lag in recovery rate. Hence, firstly, it is possible to assert that longer occlusion of a coronary artery has led to increase of a necrosis zone and to deeper lesions of a myocardium. Secondly, duration of myocardium stunning directly depends on duration of coronary artery occlusion. In other words, the longer occlusion of a coronary artery was lasted, the more time is required for restoration of the stunning myocardium. Thus as shown by the study carried out by us, at STEAMI, restoration of a normal coronary blood flow in the shortest terms from the beginning of disease by means of stenting of infarct-related coronary artery from the first days of disease

allows to improve pump functions of heart due to faster restoration of stunning myocardium zones.

Conclusions

This study demonstrates that stenting of the IRA at STEAMI leads to fast restoration of indicators of regional LV contraction due to reduction of stunning myocardium zones. Recovery rate of LV contractile functions after PTCA and stenting of the IRA directly depends on "symptom-balloon" time.

References

1. Amosova E.N., Rudenko U.V., Tkachuk L.S. Comparative clinical efficiency of primary percutaneous interventions and thrombolytic therapy at patients with acute myocardial infarction// Sertse i sudini. - 2003. - № 3. - pp. 44-49.
2. Sokolov U.N., Sokolov M.U, Tarapon I.V., Chubko V. I. Nearest and remote results of primary percutaneous coronary interventions at acute myocardial infarction// Sertse i sudini. - 2003. - № 3. - pp. 38-43.
3. Armstrong P.W., Collen D. Fibrinolysis for acute myocardial infarction. Current status and new horizons for pharmacological reperfusion. Part 1 // Circulation. – 2001. – Vol. 103. – P. 2862-2866.
4. Brodie B.R., Stuckey T.D., Hansen Ch., Muncy D. Benefit of coronary reperfusion before intervention on outcomes after primary angioplasty for acute myocardial infarction // Amer. J. Cardiology. – 2000. – Vol. 85. – P. 13-18.
5. Gibson C.M., Cannon C.H.P., Murphy S.A. Relationship of TIMI myocardial perfusion grade to mortality after administration of thrombolytic drugs // Circulation. – 2000. – Vol. 101. – P. 125-130.
6. The task force on the management of acute myocardial Infarction of the European Society of Cardiology//Management of acute myocardial infarction in patients presenting with ST-segment elevation/F. van de Werf, D. Ardissino, A. Betriu et al. // Eur. Heart J. – 2003. – Vol. 24. – P. 28-66.
7. TIMI Study Group. The Thrombolysis In Myocardial Infarction (TIMI) trial: Phase 1

Case Reports

findings // New Engl. J.
Med. – 1985. – Vol. 312. – P. 932-936.

8. Aschermann M., Widimsky P. I have an acute myocardial infarction: open my coronary artery, stent it and keep full flow! // Eur. Heart J. – 2002. – Vol. 23. – P. 913-916.
9. Schömig A., Mehilli J., Antoniucci D. et al. Mechanical Reperfusion in Patients With Acute Myocardial Infarction Presenting More Than 12 Hours From Symptom Onset. A Randomized Controlled Trial. JAMA. June 15; 2005; 293:2865-2872.

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