The beneficial effect of new method of intracoronary adenosine injections during primary PCI on microvascular repercussion injury - clinical outcome and one-year follow-up

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Background: High risk ST segment elevation myocardial infarction patients undergoing reperfusion therapy continue to exhibit significant morbidity and mortality due to percutaneous coronary reperfusion injury. Reperfusion, although it reverses or reduces ischemia and necrosis, is followed by morphological and functional changes that ultimately result in tissue damage known as reperfusion injury. Adenosine, which is capable of dilating the coronary resistance vessels and increasing flow is one of the used agents in the treatment of no-reflow. Moreover, adenosine antagonizes many of biochemical and physiological mechanisms implicated in ischemia-reperfusion injury and has been shown to reduce postischemic ventricular dysfunction and myocardial necrosis and apoptosis. The exact mechanisms of cardioprotective effect of adenosine is not fully understood, although neutrophil activation and prevention of endothelial damage seem to play a major role.

Objectives: The aim of single-center, randomized placebo-controlled trial in 70 consecutive patients (64±14 years) with acute myocardial infarction was to examine the role of new protocol of adenosine administration during primary angioplasty on immediate electrocardiographic and angiographic results, clinical outcome and one-year follow-up.

Methods: Group A (n=35) received two times intracoronary adenosine through the guiding catheter: immediately after crossing the lesion of the infarct related artery with guidewire and then after first balloon inflation. Group B (n=35) received placebo.

Results: Resolution of ST segment elevation was more frequently observed in adenosine than in placebo group (p<0.01). PCI resulted in borderline better TIMI 3 flow after procedure in adenosine group than in placebo group. Myocardial blush grade 3 at the end of procedure was significantly improved in adenosine compared to placebo group (p<0.05). The 1-year the composite end-point of death, recurrent myocardial infarction, heart failure and clinically driven target vessel revascularization was present in 8 patients in adenosine group and 16 patients in placebo group (p<0.05).

Conclusions: Intracoronary adenosine improved electrocardiographic and angiographic results in patients undergoing primary percutaneous coronary intervention and seemed to be associated with more favorable clinical course.