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The beneficial effect of new method of intracoronary adenosine injections during primary PCI on microvascular reperfusion 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 in part to myocardial reperfusion injury. Reperfusion, although it relieves 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 myocyte 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.

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Prevention of myocardial injury after percutaneous coronary interventions with remote ischemic preconditioning: A comparative analysis with biomarkers and cardiac magnetic resonance


**Background:** Myocardial necrosis after cardiac procedures has been associated with significant morbidity and mortality. Remote ischemic preconditioning (RIPC) is an important phenomenon in cardioprotection that has been proven to prevent or reduce myocardial injury after PCI. The use of cardiac magnetic resonance (CMR) with late gadolinium enhancement (LGE) in the setting of PCI permits the evaluation of myocardial necrosis and fibrosis. We evaluated the 12-month clinical outcomes between PCI and RIPC group and compared to placebo group.

**Methods:** Consecutive patients with stable coronary artery disease (CAD) and preserved ventricular function assigned for elective PCI of at least 2 major coronary arteries were elective for the protocol. CMR with LGE was performed in all patients before and after PCI. Measurements of cardiac biomarkers were performed systematically before and after the procedure, and every 6 hours until 48h.

**Results:** Twenty nine consecutive patients were included (9 in RIPC group and 20 in control group). The two groups were well-matched for baseline demographic, clinical, and angiographic characteristics. Patients with procedure-related myocardial injury were less frequent on LGE compared to control: 3 (33.3%) vs 15 (75%), p=0.048. The IPC group had lower means of area under the curve of troponin 10.9 ±15.1) vs 54.23 ±69.6), p=0.014 and CKMB 76.3 ±52.9 vs 219.3 ±192.4), p=0.005. There were two patients with new subendocardial fibrosis on CMR after the procedure, both on the control group.

**Conclusions:** In this study, remote ischemic preconditioning seems to confer protection against PCI-related myocardial injury.

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Long-term invasive follow-up of the everolimus-eluting bioresorbable vascular scaffold: five-year results of multiple invasive imaging modalities

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**Background:** Invasive imaging modalities have shown restoration of vasomotion, prevention of restenosis and most importantly increase in lumen area between 6-months and 2-years after first-generation everolimus-eluting bioresorbable vascular scaffold (Absorb BVS) implantation. Our aim was to assess whether these positive findings were sustained in the long-term.

**Methods:** Patients included in the ABSORB Cohort A from the Thoraxcenter Rotterdam cohort underwent coronary catheterization including angiography, intravascular-ultrasound (IVUS), virtual histology, optical coherence tomography (OCT) and vasomotion testing at 5-years.

**Results:** Eight out of 16 patients underwent catheterization and scaffold assessment with multiple imaging modalities. A trend towards an increase in minimal luminal diameter was observed between 2- and 5-years by angiography (1.95±0.37 mm versus 2.14±0.38; p=0.09). IVUS data showed an increase in mean lumen area at 5-years (6.96±1.13 mm²) compared to 6-months (6.7±0.74 mm²; p<0.05) and 2-years (6.56±1.16 mm²; p=0.12), primarily due to a persistent reduction in plaque area size between 6-months and 5-years (9.17±1.86 mm² versus 7.57±1.63 mm²; p=0.03). The necrotic core area was reduced at 5-years compared to post-procedural results. In OCT, an increase in mean and minimal luminal area was observed. Moreover, no scaffold struts could be identified and a smooth endoluminal lining was observed. The scaffolded coronary segment did not show signs of endothelial dysfunction with acetylcholine testing.