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## Rating of the limitation of damage to the left ventricle through the use of hypothermia of heart after reperfusion in STEMI - animal model

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The use of direct hypothermia of heart by METcooler used in the treatment of heart attack (STEMI) significantly reduces infarct size (microvascular obstruction (MVO)) and reduces the impairment of left ventricular systolic function (EF)

**Background:** Current treatments for myocardial infarction (MI) involves the reduction of two modifiable affecting the area of damage to the heart and patient outcome: ie. the time - from the first signs of MI to opening occluded artery (the shorter the damage less) and the use of appropriate pharmacological treatment. Modification of metabolic activity seems to be possible third modifiable which may have an impact on damage to the left ventricular (LV) in the course of heart attack, especially during the critical ischemia. The use of direct hypothermia of heart during acute cardiac ischemia in order to reduce the level of metabolic activity of the heart tissue can significantly reduce the area of LV damage and improve the patients prognosis.

**Methods:** The study was conducted on animal model. For this purpose we randomized 20 animals (domestic swine) to the study - 10 to the study group (SG) and 10 to the control group (CG). At the baseline, we found there is no significant difference in the age of the animals, sex, and anthropometric parameters. Animals in the CG were sequentially given analgesia, sedation and respiratory therapy. After that we get an arterial access (femoral artery), performed coronarography and by using balloon catheters perform inflation in proximal part of LAD (POBA) (target prox / mid LAD with a diameter of 2.5-3.0 mm behind DG1). After 60 minutes the balloon was deflated and removed from the LAD. The animal was observed, monitored (if necessary appropriate medication were given). Past 48-hours since POBA the MRI was performed with assessment of LV function and assessment of microvascular obstruction (MVO, microvascular obstruction) with a quantitative estimation of MVO. Similarly in SG the coronary angiography was performed with extended (60 minutes) POBA LAD. After removal of balloon catheter from the LAD, a dry puncture of pericardium (pericardial catheter inserted to pericardial sac) was performed, with subsequent, a 12 hrs procedure of direct hypothermia of heart (saline cooled to 30°C). 48 hours since POBA, there was MRI evaluation made in CG (MRI CG2) with estimation of LV function and MVO.

**Results:** Comparison of baseline EF and MVO in CG1 and SG1 showed no significant differences (all p > 0.05). MVO was significantly reduced at SG2, and EF was significantly greater in SG2 comparison to the CG2. Similarly, for the EF and MVO significant difference was observed between the SG2 and CG2 (p < 0.001).

**Conclusion:** The use of direct hypothermia of heart by METcooler in STEMI significantly reduced the extent of damage of left ventricle.

## Biography

Dr Tomasz M Kameczura is interventional cardiologist, consultant of cardiology. Living and working in Poland, EU. Experienced in PCI of LM. He is also university lecturer and inventor. Currently working on optimization and safety procedures of heart hypothermia.

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