

Poster presentation

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## Effect of low-dose dobutamine on myocardial uptake of manganese - a possible viability marker in cardiac MRI

Brage H Amundsen\*<sup>1</sup>, Anders Thorstensen<sup>1</sup>, Arne Skold<sup>2</sup>, Morten Bruvold<sup>1</sup>, Asbjørn Støylen<sup>1</sup>, John Georg Seland<sup>1</sup>, Heidi Brurok<sup>1</sup>, Per Jynge<sup>1</sup>, Henrik Larsson<sup>1</sup> and Olav Haraldseth<sup>1</sup>

Address: <sup>1</sup>NTNU, Trondheim, Norway and <sup>2</sup>St Olavs Hospital, Trondheim, Norway

\* Corresponding author

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### Introduction

The MRI contrast media manganese-dipyridoxyl-diphosphate (MnDPDP) has been shown to be a marker of viability in patients with myocardial infarction, as manganese-ions follow the calcium-pathways and accumulate in viable myocardial cells. However, the contrast-to-noise ratio is presently too low for clinical use. In a previous study in rats given manganese-chloride (MnCl<sub>2</sub>), dobutamine increased the myocardial uptake of Mn significantly.

### Purpose

To study if a dobutamine-induced increase in contractility, giving increased calcium-cycling, would increase the uptake of Mn in healthy human myocardium.

### Methods

Twelve healthy subjects were randomized into two groups. Both groups were given a 5-min infusion of 5 μmol/kg MnDPDP. In addition, one of the groups (n = 6) also got at 10-min infusion of low-dose dobutamine (10 mikrog/kg/min), starting at the onset of the MnDPDP-infusion. Myocardial Mn-uptake was quantified by R1-measurements by MRI (1.5 T) before and 50 min after start of the infusions. Heart rate and blood pressure were monitored during the experiments.

### Results

There were no adverse events. The double product (HR × blood pressure) increased in the Dobutamine group only (p < 0.05), indicating increased contractility. Delta R1-values showed no significant difference in the myocardial uptake of Mn in the two groups (Dobutamine vs. Control: 0.33 ± 0.04 vs. 0.37 ± 0.02, p = 0.078). Higher values indicate higher uptake).

### Conclusion

Differences in calcium-cycling in humans and rodents, and possibly limited availability of free manganese-ions in vivo, might explain the lack of increase in myocardial contrast uptake after dobutamine seen in this study. Further pharmacokinetic studies are needed to develop the method.