Reviewer's report

**Title:** Rapid short-duration hypothermia with cold saline and endovascular cooling before reperfusion reduces microvascular obstruction and myocardial infarct size

**Version:** 1  **Date:** 11 September 2007

**Reviewer:** Michael Maeng

**Reviewer's report:**

**General**

The study by Dr. Gotberg and colleagues is a sequential to a previous study from the same group. Generally the study is well-designed, the results nicely presented and the manuscript is easy to read and the messages clear.

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**Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)**

1. The method used for assessment of "microvascular obstruction" is not validated. Therefore microvascular obstruction should not be used in the title, abstract, and conclusion. The authors should provide illustrations of no microvascular obstruction (pre-reperfusion hypothermia) and of microvascular obstruction (normothermia) so that the reader gets some trust to this unvalidated method.

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**Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)**

1. Background section: p4, "....no therapy has yet reached clinical practice mainly because of difficulties in administration of the drug to the ischemic myocardium before reperfusion." It is this reviewers opinion that they have not reached clinical practice as the therapies have had no beneficial effects in the clinical trials. Please rephrase.

2. Figure 1: Based on the figure it seems that the post-reperfusion group had a longer total intervention period. Is that true?

3. The heart was removed after 4 h 22 min +- 47 min (SEM!). Why this great variation? It should be possible to standardize in an experimental setting.

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**Discretionary Revisions (which the author can choose to ignore)**

1. Methods: The closed chest pig model is probably the best pre-clinical model available. Temperature control is of uttermost importance and this issue is controlled perfectly. Assessment of AAR by SPECT has a higher variability than
ex-vivo histomorphometry while ex-vivo MRI is reported to have an accuracy similar to histomorphometry. The combination (AAR by SPECT + IS by MRI) should thus give greater variability than histomorphometric assessment of AAR and IS. Despite this the authors find a significant difference using a relatively small number of animals.

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests