A meta-analysis of glucose-insulin-potassium therapy for treatment of acute myocardial infarction

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CRD summary
This updated review concluded that there was no benefit in using glucose-insulin-potassium therapy on mortality for patients with ST segment elevation acute myocardial infarction. The reliability of this conclusion is unclear given the potential for missing studies, unclear review methods and the unknown quality of included trials.

Authors' objectives
To evaluate the effects of glucose-insulin-potassium therapy on 30-day mortality following acute myocardial infarction, updating a previous review.

Searching
MEDLINE was searched from 1996 to February 2008. Search terms were reported. Reference lists of studies and review articles were also searched.

Study selection
Randomised controlled trials of glucose-insulin-potassium therapy following acute myocardial infarction that reported 30-day mortality rates were eligible for inclusion. Trials that used inadequate forms of randomisation (detailed in the paper) or were limited to a particular subgroup were excluded.

In included trials, high-dose and low-dose glucose-insulin-potassium therapy were used (doses not specified); the duration of therapy was from 12 to 24 hours (where reported). The delay between acute myocardial infarction and treatment was less than 12 hours up to 48 hours. The authors stated that all of the included trials would have included patients with ST-segment elevation myocardial infarction. Further participant characteristics were not reported. It appeared that control groups received a placebo.

The authors did not state how studies were selected for the review.

Assessment of study quality
The authors did not report any quality assessment of the included trials.

Data extraction
Data to calculate odds ratios (OR) and 95% confidence intervals (CI) for 30-day mortality were extracted. The $X^2$ test was used to calculate differences in mortality between the glucose-insulin-potassium and placebo group in trials where the expected number of deaths was five or more. For trials in which the number of deaths was less than five, the Fisher's exact test was used.

The authors did not state how many authors carried out the data extraction.

Methods of synthesis
Odds ratios and 95% confidence intervals were synthesised in a meta-analysis. The type of model used for the meta-analysis was not reported. Trials in this meta-analysis were merged and re-analysed with a meta-analysis of nine trials published prior to 1996 (see Other Publications of Related Interest).

Subgroup analyses were performed in patients where reperfusion strategies were not used, and in those where high-dose glucose-insulin-potassium therapy was administered.
Results of the review

Seven RCTs were included in the review (n=26,422 patient, range 312 to 20,195 from table 2). Five RCTs were open-label design.

There was no significant difference between the glucose-insulin-potassium group and control group for 30-day mortality (OR 1.05, 95% CI 0.97 to 1.14; seven RCTs). The re-analysis of results including those of the previous meta-analysis did not substantially alter the findings. There were no statistically significant findings from the subgroup analyses.

Authors' conclusions

There was no benefit in using glucose-insulin-potassium therapy on mortality for patients with ST segment elevation acute myocardial infarction when more modern thrombolysis/primary percutaneous coronary intervention data were included.

CRD commentary

The review question was defined for the study design, intervention, and outcome. The inclusion criteria for participants were not explicitly described. The restriction to one database in the search strategy and the absence of detail on attempts to minimise language and publication biases means that studies may have been missed. The authors did not report the review process for the selection of studies or data extraction, so the potential for error and bias could not be ruled out.

The quality of included trials was not reported, so the reliability of individual trials and their subsequent synthesis was unclear. It was not clear whether the chosen method of synthesis was appropriate, given that statistical heterogeneity was not reported and study characteristics were not sufficiently detailed to assess clinical variation.

The authors’ conclusion on mortality following acute myocardial infarction reflected the evidence presented, but several methodological limitations in the review means that the reliability of this conclusion is unclear.

Implications of the review for practice and research

Practice: The authors stated that the findings of this review did not support the use of glucose-insulin-potassium therapy as a treatment strategy in acute myocardial infarction.

Research: The authors stated that ongoing trials may clarify whether earlier initiation of glucose-insulin-potassium therapy is associated with benefit in acute coronary syndromes.

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