Does PTCA in acute myocardial infarction affect mortality and reinfarction rates: a quantitative overview (meta-analysis) of the randomized clinical trials

Michels K B, Yusuf S

Authors' objectives
To assess the effect of percutaneous transluminal coronary angioplasty (PTCA) after acute myocardial infarction (AMI) on mortality and reinfarction rates.

Searching
Electronic searches of MEDLINE and Index Medicus were made. Handsearching of original articles and reviews, and screening of abstracts of the major cardiology meetings between 1984 and 1994 (Scientific Sessions of the American Heart Association, the American College of Cardiology and the European Society of Cardiology) were carried out. In addition, the principal author of all identified studies was approached and invited to submit other unpublished or overlooked studies for consideration.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) of either primary PTCA or PTCA after thrombolysis.

Specific interventions included in the review
PTCA either as a primary intervention or after thrombolysis.

Participants included in the review
Patients treated for AMI were included.

Outcomes assessed in the review
Short-term mortality (6 weeks AMI, or the closest reported time during short-term follow-up), mortality at 1 year after AMI, non-fatal reinfarction within 6 weeks and non-fatal infarction 1 year after AMI.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
Validity was assessed on the basis of study design (explicit details are not available). The authors do not state how the papers were assessed for validity, or how many of the authors performed the validity assessment.

Data extraction
The method of data extraction (i.e. number of authors, blind assessment, etc.) is not stated, but information was sought on the exact study design, on the numbers actually undergoing PTCA in each group and on the 6-week and 52-week outcomes (survival and recurrence-free survival, i.e. survival without reinfarction). The data were extracted into standardised tables and then mailed to the principal investigator for verification and addition of missing data.

Methods of synthesis
How were the studies combined?
For an individual study the odds ratios (OR) were determined for each outcome and combined using the method described by Mantel and Haenszel (see Other Publications of Related Interest).
How were differences between studies investigated?
A chi-squared test for heterogeneity was used.

**Results of the review**
There were 7 trials where PTCA was the primary intervention and 16 trials where PTCA was performed after thrombolysis (8,496 patients in total).

PTCA) compared with thrombolysis.

Reduction in short-term (6 week) mortality: OR=0.56 (95% CI: 0.33, 0.94).

Short-term mortality and non-fatal reinfarction: OR=0.53 (95% CI: 0.35, 0.80).

Long-term data were not available.

Thrombolysis and PTCA compared with thrombolysis alone.

Reduction in short-term (6 week) mortality: OR=0.38 (95% CI: 0.13, 1.06).

Short-term mortality and non-fatal reinfarction: OR=1.78 (95% CI: 0.99, 3.19).

Reduction in long-term (1 year) mortality: OR=6.79 (95% CI: 1.32, 35.03).

Long-term mortality and non-fatal reinfarction: OR=2.24 (95% CI: 1.19, 4.19).

The lower mortality between 6 weeks and 1 year among 6-week survivors seemed to be restricted to the subgroup of trials in which PTCA was used as a routine strategy: OR=0.58 (95% CI: 0.39, 0.87).

**Authors’ conclusions**
There is a suggestion that primary PTCA may be more beneficial than thrombolytic therapy in AMI. However, this data should be interpreted cautiously until confirmed by larger studies. In contrast, the addition of various strategies of PTCA to thrombolytic therapy does not convincingly indicate a clinically different outcome than if a more conservative strategy is followed, in which PTCA is used only if clinically indicated. Some specific strategies, however, such as rescue PTCA in high-risk patients with occluded arteries, may be of benefit.

**CRD commentary**
The authors searched a variety of sources to obtain relevant literature. Additional searches of electronic databases would have been desirable, but costly and resources may not have allowed for such an extended search. In the reporting of the search strategy, it would have been useful if the dates and any language restrictions had been mentioned and brief details of the search terms were provided. Considering the heterogeneity between trials alluded to by the authors, the use of explicit validity criteria would have been desirable.

This is a good review, but there are some methodological weaknesses. The authors are correct to suggest that the results should only be considered as indicative and not definitive.

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