Review: PTCA reduces adverse cardiac outcomes and death better than thrombolytic after myocardial infarction


QUESTION: In patients with acute myocardial infarction (MI), is percutaneous transluminal coronary angioplasty (PTCA) more effective than thrombolytic treatment?

Data sources
Studies were identified by searching Medline, reviewing scientific session abstracts in the New England Journal of Medicine and 5 cardiology journals, and contacting authors.

Study selection
Studies were selected if they were published or unpublished randomised controlled trials (RCTs) comparing primary PTCA with intravenous thrombolytic treatment for acute ST segment MI.

Data extraction
Data were extracted on patient characteristics, symptom duration, use of stents or glycoprotein IIb/IIIa antagonists, thrombolytic agent used, time to treatment, and results. Outcomes included total mortality, reinfarction, stroke, haemorrhagic stroke, major bleeding, and disabling stroke. Short term (4–6 wk) and long term (6–18 mo) effectiveness was assessed.

Main results
23 trials (n=7739) met the inclusion criteria. 8 trials compared PTCA with streptokinase (n=1857) and 15 compared PTCA with fibrin specific agents (n=5902).

Overall, PTCA was superior to thrombolytic treatment in the short term in reducing death, nonfatal reinfarction, stroke, haemorrhagic stroke, and the combined endpoint (table). PTCA was associated with greater risk of major haemorrhage (7% v 5%, odds ratio 1.30, 95% CI 1.02 to 1.63). The effectiveness of PTCA was maintained during long term follow up. The exclusion from the meta-analysis of 1 trial, which enrolled high risk patients with cardiogenic shock and compared a direct invasive strategy with thrombolysis and intra-aortic balloon pump, did not affect the results for all cause mortality (OR 0.70, CI 0.58 to 0.85). The results also were not affected by type of thrombolytic used.

Conclusion
In patients with acute myocardial infarction, percutaneous transluminal coronary angioplasty is more effective than thrombolytic treatment in reducing adverse cardiac events and death and is less likely to result in haemorrhagic stroke.

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TABLE 1.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Weighted event rates</th>
<th>RRR (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PTCA</td>
<td>TT</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>7.0%</td>
<td>9.3%</td>
<td>25% (13 to 36)</td>
</tr>
<tr>
<td>Nonfatal reinfarction</td>
<td>2.5%</td>
<td>6.8%</td>
<td>63% (53 to 72)</td>
</tr>
<tr>
<td>Stroke</td>
<td>0.9%</td>
<td>2.0%</td>
<td>54% (28 to 70)</td>
</tr>
<tr>
<td>Haemorrhagic stroke</td>
<td>0.05%</td>
<td>1.1%</td>
<td>95% (65 to 99)</td>
</tr>
<tr>
<td>Combined endpoint</td>
<td>8.1%</td>
<td>14%</td>
<td>43% (34 to 51)</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary; RRR, NNT, and CI calculated from data in article using odds ratios.