

Review: Early angioplasty improves outcomes for patients with myocardial infarction

Weaver WD, Simes RJ, Betriu A, et al. **Comparison of primary coronary angioplasty and intravenous thrombolytic therapy for acute myocardial infarction. A quantitative review.** *JAMA.* 1997 Dec 17;278:2093-8.

Objective

To compare the effects of intravenous thrombolytic drug therapy with primary percutaneous transluminal coronary angioplasty (PTCA) in patients with suspected acute myocardial infarction.

Data sources

Studies were identified by searching MEDLINE databases (1985 to March 1996), hand searching scientific session abstracts in journals (1993 to March 1996), and contacting authors.

Study selection

Studies were selected if they were published or unpublished randomized controlled trials that compared intravenous thrombolytic therapy (any intravenous regimen of streptokinase or tissue-type plasminogen activator) with primary PTCA.

Data extraction

Data were extracted on deaths, nonfatal reinfarctions, combined death or reinfarction rate, total strokes, hemorrhagic strokes, and major bleeding (defined as needing a blood transfusion) at ≤ 30 days.

Commentary

The meta-analysis by Weaver and colleagues was accompanied by an extremely insightful editorial (1). I would encourage interested readers to review this editorial because important methodologic and clinically relevant issues were discussed.

Are the results of this meta-analysis and the included studies sufficiently compelling that PTCA should be considered the preferred reperfusion strategy in acute myocardial infarction? Not yet. The small number of patients randomized (compared with the many tens of thousands included in thrombolysis vs placebo trials), the borderline statistical significance of the results, and the short duration of follow-up

Main results

10 randomized controlled trials (2606 patients) met the inclusion criteria. Patients treated with primary PTCA had a lower risk for death ($P = 0.02$), nonfatal infarction, the combined end point of death and nonfatal infarction ($P < 0.001$), stroke ($P = 0.007$), and hemorrhagic stroke ($P < 0.001$) than those treated with thrombolysis (Table). There was no difference between treatments in the number of patients who had major bleeding (Table).

Conclusion

In the short term, primary PTCA leads to lower rates of death, nonfatal infarction, stroke, and hemorrhagic stroke than does intravenous thrombolytic drug therapy in patients with suspected acute myocardial infarction.

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Primary percutaneous transluminal coronary angioplasty (PTCA) vs thrombolysis for suspected acute myocardial infarction*

Outcomes at ≤ 30 d	PTCA weighted EER	Thrombolysis weighted CER	Odds ratio (95% CI)	ARR	NNT (CI)
Death	4.4%	6.5%	0.66 (0.46 to 0.94)	2.1%	47 (29 to 250)
Nonfatal reinfarction	2.9%	5.3%	0.53 (0.34 to 0.80)	2.4%	41 (29 to 100)
Death and nonfatal reinfarction	7.2%	11.9%	0.58 (0.44 to 0.56)	4.6%	22 (16 to 38)
Total stroke	0.7%	2.0%	0.35 (0.14 to 0.77)	1.3%	77 (47 to 250)
Hemorrhagic stroke	0.1%	1.1%	0.07 (0.0 to 0.43)	1%	100 (61 to 214)
	PTCA weighted EER	Thrombolysis weighted CER	Odds ratio (95% CI)	ARI	NNH
Major bleeding	8.8%	8.4%	1.06 (0.79 to 1.41)	0.4% (CI -2 to 25)	Not significant

*Abbreviations defined in Glossary; ARR, ARI, NNT, NNH, and CI calculated from data in article; ARR and ARI are not weighted.

should prompt a cautious approach. Of note, the largest trial (GUSTO II) showed a diminution of effect over time.

If PTCA cannot be recommended routinely as the preferred reperfusion strategy, are there subgroups of patients who might benefit? Unfortunately, the trials compared PTCA with different thrombolytic agents administered in different ways to different types of patients. Attempting to dissect which groups might benefit to a greater degree is fraught with the problems inherent in subgroup analyses.

At present, PTCA seems to be as good as, but has not been proven to be better than, thrombolysis in acute myocardial in-

farction. The decision to choose PTCA over one of the thrombolytic agents must be made on the basis of the existence of local expertise and experience in direct PTCA in the context of a particular health care system. Future comparative studies should be exciting.

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Reference

1. Yusuf S, Pogue J. Primary angioplasty compared with thrombolytic therapy for acute myocardial infarction [Editorial]. *JAMA.* 1997;278:2110-1.