

Review: Rescue percutaneous coronary intervention but not repeated fibrinolysis is effective for failed fibrinolysis in STEMI

Wijeyesundera HC, Vijayaraghavan R, Nallamotheu BK, et al. Rescue angioplasty or repeat fibrinolysis after failed fibrinolytic therapy for ST-segment myocardial infarction: a meta-analysis of randomized trials. *J Am Coll Cardiol.* 2007;49:422-30.

Clinical impact ratings: Hospitalists ★★★★★☆ Cardiology ★★★★★☆☆

QUESTION

In patients with ST-segment elevation myocardial infarction (STEMI) in whom fibrinolytic therapy fails, what are the benefits and risks of rescue percutaneous coronary intervention (PCI) or repeated fibrinolytic therapy compared with conservative management?

METHODS

Data sources: MEDLINE, EMBASE/Excerpta Medica, Cochrane Library (to February 2006), and reference lists.

Study selection and assessment: Randomized controlled trials (RCTs) that compared a strategy of either rescue PCI or repeated fibrinolytic therapy with conservative management (no further immediate reperfusion therapy) in patients with STEMI in whom initial fibrinolytic therapy had failed (by angiographic or clinical definitions). 6 RCTs ($n = 908$, mean age range 57 to 63 y, 76% men) of rescue PCI and 3 RCTs ($n = 410$, mean age range 56 to 63 y, 75% men) of repeated fibrinolysis (with tissue-type plasminogen activator) met the selection criteria. Quality of individual trials was assessed using the Jadad scale.

Outcomes: All-cause mortality, heart failure, reinfarction, stroke, and major and minor bleeding.

MAIN RESULTS

Rescue PCI reduced risk for reinfarction more than conservative management, but reductions in mortality and heart failure did not reach statistical significance (Table). Rescue PCI increased risks for stroke and minor bleeding (Table). Groups did not differ for major bleeding (1 RCT, $n = 285$). Repeated fibrinolysis and conservative management did not differ for mortality, reinfarction, major bleeding (Table), heart failure (1 RCT, $n = 283$), or stroke (1 RCT, $n = 283$). Risk for minor bleeding was higher in the repeated fibrinolysis group (Table).

CONCLUSION

In patients with ST-segment elevation myocardial infarction in whom fibrinolytic therapy fails, rescue percutaneous coronary intervention reduces risk for reinfarction more than conservative management, but repeated fibrinolytic therapy does not provide any benefit.

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Rescue percutaneous coronary intervention (PCI) or repeated fibrinolytic therapy (FT) vs conservative management (control) for ST-segment elevation myocardial infarction with failed fibrinolysis*

Outcomes	Number of trials (n)	Weighted event rates		RRR/RII (95% CI)	NNT/NNH (CI)
		Rescue PCI	Control		
Mortality	6 (908)	7.1%	10%	RRR: 31% (-5 to 54)	Not significant
Heart failure	4 (851)	13%	18%	RRR: 27% (0 to 46)	Not significant
Reinfarction	3 (700)	6.2%	11%	RRR: 42% (3 to 65)	NNT: 23 (15 to 312)
Composite endpoint†	3 (700)	30%	41%	RRR: 28% (12 to 41)	NNT: 9 (6 to 21)
Stroke	2 (592)	3.4%	0.7%	RII: 398% (10 to 2148)	NNH: 38 (7 to 1475)
Minor bleeding	3 (620)	16%	3.6%	RII: 358% (146 to 755)	NNH: 8 (4 to 20)
		Repeated FT	Control		
Mortality	3 (410)	11%	16%	RRR: 32% (-14 to 59)	Not significant
Reinfarction	2 (373)	12%	6.5%	RII: 79% (-8 to 248)	Not significant
Major bleeding	2 (373)	4.1%	2.7%	RII: 54% (-46 to 248)	Not significant
Minor bleeding	3 (410)	14%	7.8%	RII: 84% (6 to 218)	NNH: 16 (6 to 213)

*Abbreviations defined in Glossary. RRR, RRI, NNT, NNH, and CI calculated from relative risks and control event rates in article using a fixed-effects model.

†Mortality, heart failure, or reinfarction.

COMMENTARY

It has been nearly impossible to conduct RCTs of rescue PCI in the United States because of the strong bias toward it. Guidelines considered rescue PCI to be a class 1 indication even before trials indicated its benefit (1). Although there are important differences among the trials included in the meta-analysis by Wijeyesundera and colleagues, the data are sufficiently compelling to support routine performance of rescue PCI and its classification as a class 1 indication in STEMI guidelines. Rescue PCI increases bleeding complications, but a radial artery approach has been shown to reduce bleeding rates and may be particularly beneficial in this setting (2).

Many unanswered questions remain. In the 6 RCTs included in this meta-analysis, the time from administration of fibrinolytic therapy until it was deemed a failure varied from 60 minutes to several hours. If the interval was shorter, PCI might be even more beneficial. If it was too short, it might begin to resemble facilitated PCI, which seems to increase rather than decrease morbidity and mortality (3).

Administering a glycoprotein IIb/IIIa inhibitor shortly after a full dose of a fibrinolytic agent may be beneficial, but it clearly increases bleeding (4). The data are confounded because patients least likely to

have major bleeding complications would preferentially be given such therapy, exaggerating any true benefit. True equipoise exists about whether to administer a IIb/IIIa inhibitor during rescue PCI; an RCT addressing this question is needed.

Should all patients treated with a fibrinolytic be transferred immediately to a center capable of performing PCI? Although Wijeyesundera and colleagues did not address this issue directly, the data support such an approach. We are fully aware of the political and economic implications of this recommendation and that it will be greeted with antipathy in many quarters.

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