

## Is routine early invasive management of non-ST-segment elevation myocardial infarction beneficial in elderly patients?

Bach RG, Cannon CP, Weintraub WS, DiBastiste PM, Demopoulos LA, Anderson HV, et al. The effect of routine, early invasive management on outcome for elderly patients with non-ST-segment elevation acute coronary syndromes. *Ann Intern Med* 2004;141:186-95.

**Background:** The advantages of early invasive management (cardiac catheterization or revascularization) of non-ST-segment myocardial infarction (non-STEMI) over a conservative approach (in-hospital observation and predischARGE stress testing, with catheterization reserved only for spontaneous or inducible high-risk ischemia) remain controversial. Initial trials suggested no superiority;<sup>1,2</sup> however, recent trials have shown improved quality of life, fewer reinfarctions and fewer ischemia-related hospital readmissions as well as a suggested reduction in mortality with the early invasive strategy.<sup>3,4</sup> Inconsistencies between the initial and recent trials have been attributed to the use of thienopyridines, glycoprotein IIb/IIIa in-

hibitors and coronary artery stenting in the more recent trials. Few studies have examined whether these advantages are generalizable to elderly patients — a high-risk subgroup that accounts for the majority of patients with non-STEMI.

**Design:** This international randomized controlled trial (TACTICS-TIMI 18) enrolled 2220 patients who had clinical features consistent with non-STEMI. Patients were excluded if they had bleeding disorders, cerebrovascular disease, congestive heart failure, renal dysfunction or other important systemic disease or if they were receiving long-term therapy with ticlopidine, clopidogrel or warfarin. All of the participants received ASA, un-

fractionated heparin and tirofiban and were randomly assigned to either the early invasive strategy or the early conservative therapy. End points included death, nonfatal myocardial infarction, readmission because of acute coronary syndrome, bleeding and stroke.

**Results:** Almost half (43%) of the cohort was 65 years of age or older; these patients constituted a higher risk group than the younger patients, as noted by the distribution of the TIMI risk scores (score of 3 or greater in 90.6% of the elderly patients v. 63% of the younger patients,  $p < 0.001$ ). Among the patients in the early invasive strategy group, 96% and 64% received coronary angiography and revascularization (percutaneous transluminal coronary angioplasty or coronary artery bypass surgery) respectively, and did so within 48 hours after hospital presentation. In contrast, the rates of coronary angiography and revascularization by 6 months from initial

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**Table 1: Clinical outcomes associated with the early invasive strategy compared with the conservative strategy in younger and older patients\***

Outcome	Patients < 65 yr old			Patients ≥ 65 yr old		
	Invasive strategy (n = 623), %	Conservative strategy (n = 635), %	Odds ratio (95% CI)	Invasive strategy (n = 491), %	Conservative strategy (n = 471), %	Odds ratio (95% CI)
<b>30 d</b>						
Death	1.1	0.6	1.79 (0.52–6.15)	3.7	3.0	1.24 (0.61–2.53)
MI	2.9	4.3	0.67 (0.37–1.23)	3.3	7.9	0.40 (0.22–0.72)
Death or MI	3.9	4.9	0.78 (0.45–1.35)	5.7	9.8	0.56 (0.34–0.91)
Rehospitalization for ACS	3.9	5.2	0.73 (0.43–1.25)	2.9	5.9	0.46 (0.24–0.89)
Death, MI or rehospitalization for ACS	6.7	8.5	0.78 (0.51–1.18)	8.2	13.2	0.59 (0.38–0.89)
<b>6 mo</b>						
Death	1.8	1.7	1.02 (0.44–2.37)	5.3	5.9	0.88 (0.51–1.53)
MI	4.7	4.9	0.95 (0.57–1.60)	4.9	9.6	0.49 (0.29–0.81)
Death or MI	6.1	6.5	0.94 (0.60–1.48)	8.8	13.6	0.61 (0.41–0.92)
Rehospitalization for ACS	11.7	14.2	0.80 (0.58–1.12)	10.2	13.2	0.75 (0.50–1.11)
Death, MI or rehospitalization for ACS	14.9	17.8	0.81 (0.60–1.09)	17.1	21.7	0.75 (0.54–1.03)

Note: ACS = acute coronary syndrome, MI = myocardial infarction.

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presentation were 53% and 38% in the conservative therapy group. Outcomes at 30 days and 6 months are shown in Table 1. Among the elderly patients, a significant absolute risk reduction of 4.6% (relative risk reduction [RRR] 58%) and 3% (RRR 48%) in nonfatal MI and readmission because of acute coronary syndrome, respectively, was shown at 30 days; similar findings were noted at 6 months. Rates of death were similar in both groups.

**Commentary:** This study shows that elderly patients may derive benefit from an early invasive strategy for the management of non-STEMI. Although no mortality difference was observed between the 2 groups, there were 47 fewer nonfatal MIs over a 6-month period for every 1000 patients treated with an invasive strategy. The study's strengths include its high-quality prospective design, the large sample and the relevant end points. Limitations include lack of details on other medical interventions used and the exclusion of elderly patients with significant comorbidities.

**Practice implications:** This study is the first to explore the benefit of an early invasive strategy involving the routine use of thienopyridines, glycoprotein IIb/IIIa inhibitors and coronary stenting among elderly patients with non-STEMI. The findings are consistent with those of recent trials showing improved outcomes associated with an invasive approach for non-STEMI.<sup>3,4</sup> Although the absolute benefits in terms of the prevention of nonfatal MI and hospital readmission are impressive, enthusiasm must be tempered against uncertainty over the long-term sustainability of such benefits, the cost-effectiveness of an invasive treatment approach and its applicability in actual practice, where the increased prevalence of comorbidities may mitigate any benefits derived from such an approach. Moreover, capacity constraints and process delays in our health care system may impede the ability to deliver timely interventions and may erode the benefits associated with an early invasive strategy.

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