Timing of angiography for highrisk ACS

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A very old story.....



The Interventional Cardiologist



The Intellectual Non Interventional Cardiologist

Two questions in one....

 Routine invasive strategy: should we perform an angiogram in all patients with « high risk » ACS or should they be treated medically and tested for ischemia?

FIR metaanalysis

- Timing of angiogram: immediately, or in the first 24-48 hours?
 - TIMACS
 - ABOARD







Long-Term Outcome of a Routine versus Selective Invasive Strategy in Patients with non-ST elevation ACS

Keith AA Fox, Tim C Clayton, Peter Damman, Stuart J Pocock, Robbert J de Winter, Jan GP Tijssen, Bo Lagerqvist, Lars Wallentin

FIR collaboration: FRISC ICTUS RITA







Procedures

- 5467 patients with nSTE-ACS included
- Routine invasive strategy
 - "Early" angiography with subsequent PCI or CABG
- Selective invasive strategy
 - Angiography only if refractory angina or rest ischemia occurs despite optimal medical therapy

Primary outcomes at 5 years

	Combine	d dataset	Hazard ratio	p-value
	Selective invasive n = 2746	Routine invasive n = 2721	(95% CI)	
MI	338 12.9%	260 10.0%	0.77 (0.65 - 0.90)	0.001
CV death	218 8.1%	181 6.8%	0.83 (0.68 - 1.01)	0.068
CV death/MI	475 17.9%	389 14.7%	0.81 (0.71 -0.93)	0.002

Outcomes a	at 5 years			
	Combine			
	Combine	a dataset		p- value
	Selective invasive	Routine invasive	(95% CI)	
All-cause death	321 11.7%	288 10.6%	0.90 (0.77 -1.05)	0.19
All-cause death/Ml	560 20.9%	480 18.1%	0.85 (0.75 - 0.96)	0.008

Cumulative risk of CV death or MI by risk group



Summary

- The routine invasive strategy reduces cardiovascular death or MI at long-term follow-up
 - 3.2% absolute risk reduction in CV death/MI
 - 19% relative risk reduction
- Risk stratification identifies the patient group with the greatest absolute benefits
 - 11.1% absolute risk reduction in highest risk patients
- The absolute risk reductions in CV death/MI in low (2.0%) and Intermediate groups (3.8%) exceed those seen in many trials of pharmacological agents

Two questions in one....

- Routine invasive strategy: should we perform an angiogram in patients with ACS or should they be treated medically and tested for ischemia?
 ROUTINE INVASIVE STRATEGY
- Timing of angiogram: immediately, or in the first 24-48 hours?
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Early versus Delayed Invasive Intervention in Acute Coronary Syndromes

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- In patients with acute coronary syndromes, early invasive intervention (coronary angiography at a median of 14 hours) was compared with delayed intervention (angiography at a median of 50 hours)
- Primary outcome: composite of death, myocardial infarction, or stroke at 6 months
- Secondary outcome: death, MI, stroke or refractory angina at 6 months

Table 2. Primary and Secondary Outcomes.*				
Variable	Early Intervention (N=1593)	Delayed Intervention (N=1438)	Hazard Ratio (95% CI)	P Value
	pe	rcent		\frown
At 6 mo				
Death, myocardial infarction, or stroke	9.6	11.3	0.85 (0.68-1.06	0.15
Death, myocardial infarction, or refractory ischemia	9.5	12.9	0.72 (0.58–0.89	0.003
Death, myocardial infarction, stroke, refractory ischemia, or repeat intervention	16.6	19.5	0.84 (0.71–0.99)	0.04
Death	4.8	5.9	0.81 (0.60–1.11)	0.19
Myocardial infarction	4.8	5.7	0.83 (0.61-1.14)	0.25
Stroke	1.3	1.4	0.90 (0.49–1.68)	0.74
Refractory ischemia	1.0	3.3	0.30 (0.17-0.54)	<0.001
Repeat intervention	8.7	8.5	1.04 (0.82-1.34)	0.73
At 30 days				
Death, myocardial infarction, or stroke	6.7	7.6	0.88 (0.67–1.15)	0.34
Death, myocardial infarction, or refractory ischemia	6.6	9.3	0.70 (0.54–0.90)	0.006
Death, myocardial infarction, stroke, refractory ischemia, or repeat intervention	12.0	13.0	0.91 (0.75–1.12)	0.37
Death	2.9	3.3	0.86 (0.58-1.29)	0.48
Myocardial infarction	3.6	4.1	0.87 (0.61–1.25)	0.46
Stroke	0.9	0.9	1.04 (0.50-2.19)	0.91
Refractory ischemia	1.0	3.1	0.30 (0.17-0.55)	<0.001
Repeat intervention	5.9	4.2	1.39 (1.01–1.93)	0.05

Primary end-point Secondary end-points

* Hazard ratios are for the comparison between the early-intervention group and the delayed-intervention group.



Kaplan-Meier Cumulative Risk of the Primary Outcome, Stratified According to GRACE Risk Score at Baseline



Mehta SR et al. N Engl J Med 2009;360:2165-2175



Conclusion

 Early intervention did not differ greatly from delayed intervention in preventing the primary outcome, but it did reduce the rate of the composite secondary outcome of death, myocardial infarction, or refractory ischemia and was superior to delayed intervention in high-risk patients





Immediate vs Delayed Intervention for Acute Coronary Syndromes A Randomized Clinical Trial

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the treatment strategy of pa-

ents presenting with acute

Context International guidelines recommend an early invasive strategy for patients with high-risk acute coronary syndromes without ST-segment elevation, but the optimal timing of intervention is uncertain.

Objective To determine whether immediate intervention on admission can result in a reduction of myocardial infarction compared with a delayed intervention.

Design, Setting, and Patients The Angioplasty to Blunt the Rise of Troponin in Acute Coronary Syndromes Randomized for an Immediate or Delayed Intervention (ABOARD) study, a randomized clinical trial that assigned, from August 2006 through September 2008 at 13 centers in France, 352 patients with acute coronary syndromes without ST-segment elevation and a Thrombolysis in Myocardial infarction (TIMI) score of 3 or more to receive intervention either immediately or on the next working day (between 8 and 60 hours after enrollment).

Main Outcome Measures The primary end point was the peak troponin value during hospitalization; the key secondary end point was the composite of death, myocardial infarction, or urgent revascularization at 1-month follow-up.

Results Time from randomization to sheath insertion was 70 minutes with immediate intervention vs 21 hours with delayed intervention. The primary end point did not differ between the 2 strategies (median [interquartile range] troponin I value, 2.1 [0.3-7.1] ng/mL vs 1.7 [0.3-7.2] ng/mL in the immediate and delayed intervention groups, respectively, P = .70). The key secondary end point was observed in 13.7% (95% confidence interval, 8.6%-18.8%) of the group assigned to receive immediate intervention (P = .31). The other end points, as well as major bleeding, did not differ between the 2 strategies.

Conclusion In patients with acute coronary syndromes without ST-segment elevation, a strategy of immediate intervention compared with a strategy of intervention deferred to the next working day (mean, 21 hours) did not result in a difference in myocardial infarction as defined by peak troponin level.

Trial Registration clinicalitials gov Identifier, NCT00442949 IAMA: 2009;302(9):947-954

www.jana.com



ABOARD study design





Primary EP (peak of troponin I)



Composite Ischemic Endpoints at 1 month







Coronary angiogram in ACS: a personal view

- Routine invasive strategy: should we perform an angiogram in patients with ACS or should they be treated medically and tested for ischemia?
 - ROUTINE INVASIVE STRATEGY
- Timing of angiogram: immediately, or in the first 24-48 hours?
 - Immediately in high-risk patients
 - ST segment changes despite medical therapy
 - Heart failure or cardiogenic shock
 - VT, VF
 - Diabetes, prior CABG or PCI (+/-)

- 24-48 hours after admission in others

One size doesn't fill all !!!



Use your clinical judgment

Invasive vs. conservative

Trials in ACS: How to Compare the Results?

The greater the difference in the rate of revascularization, the greater the benefit on mortality



Difference in rate of revascularization: invasive-conservative strategies (%)

Adapted from Bassand JP et al. *Eur Heart J* 2007;**28**:1598-1660

Timing of first coronary revascularization



Differences Among ACS trials

Revascularization rates:

- In ICTUS, revascularization rates were high in the early invasive and the selectively-invasive groups
 - during the initial hospitalization: 76% and 40%
 - within 1 year after randomization: 79% and 54%
- as compared with those in
 - -TIMI-IIIb (64% vs. 58% at 1 year),
 - -VANQWISH (44% vs. 33% at 23 months),
 - -FRISC II (71% vs. 9% at 10 days, and 77% vs. 37% at 6 months),
 - -TACTICS-TIMI 18 (61% vs. 44% at 6 months), and
 - -RITA-3 (44% vs. 10% during the index admission, and 57% vs. 28% within 1 year)

Differences Among ACS trials

Biomarkers

- As in the VANQWISH trial, all patients in ICTUS had evidence of myocardial necrosis, as compared with 58% with an elevated troponin level in FRISC II, 54% in TACTICS–TIMI 18, and 75% in RITA-3.
- The fact that all patients in ICTUS were at high risk (as evidenced by an elevated troponin level) may explain the earlier and more frequent revascularization in the group assigned to a selectively invasive strategy.
- The 40% rate of revascularization in the selectively invasive group from ICTUS is comparable to the 48% observed in patients with ACS from the GRACE registry.