Coronary angiography after cardiac arrest without ST-segment elevation (COACT)

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INTRODUCTION

Background

Early coronary angiography has been shown to improve survival after cardiac arrest in patients with ST-segment elevation on electrocardiogram (ECG).[1] However, it is unknown whether there is benefit to early angiography in postarrest patients without ST-segment elevation.[2]

Objectives

Guy and colleagues sought to compare early versus delayed coronary angiography in patients after cardiac arrest without ST-segment elevation on ECG.[2]

METHODS

Design

This study was a multi-center, open-label, randomized controlled trial.

Setting

Nineteen tertiary care hospitals in the Netherlands between 2015–2018.

Subjects

Patients with out-of-hospital cardiac arrest and initial shockable rhythm found to be unconscious (Glasgow Coma Scale score < 8) after return of spontaneous circulation without ST-elevation on ECG.

Intervention

Immediate coronary angiography within 2 hours of randomization compared with delayed angiography after neurologic recovery.

Outcomes

Primary outcome was overall survival at 90 days. Secondary endpoints included various clinical outcomes during the subsequent hospital admission, along with rates of neurological disability at intensive care unit discharge and at 90 days.

RESULTS

A total of 552 patients were enrolled in the trial, with 273 randomized to immediate and 265 to delayed coronary angiography groups. Baseline patient characteristics were balanced between the two groups. Treatment with angiography was received by 97% of the immediate group and 65% of the delayed group, with percutaneous coronary intervention (PCI) performed in 33% and 24.2%, respectively. The rate of unstable coronary lesions on angiography was 14.8%, and the rate of acute thrombotic occlusion was 5.0%. Median time from randomization to treatment was 0.8 hours in the immediate group and 120 hours in the delayed group. Both groups received standard critical care including targeted temperature management in 90% of patients. The

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primary outcome of survival at 90 days was 64.5% in the immediate angiography group compared with 67.2% in the delayed angiography group (odds ratio, 0.89; 95% confidence interval, 0.62–1.27; $p = 0.51$). No differences were found in any of the secondary outcomes. In both groups, three times as many patients died of neurologic causes as from cardiac causes.

APPRAISAL

Strengths

- Clear, sensible, and important question
- Rigorous methodology with careful randomization
- Internally valid
- Standardized approach to coronary intervention
- High rate of follow-up
- Minimal cross-over between arms and intention to treat analysis
- Comparable groups at baseline
- Multi-center trial
- Cardiac arrest critical care was delivered in a developed nation, likely with similar management to North American practice

Limitations

- Limited generalizability given low coronary disease burden of the studied population
- Prior literature revealed rates of acute occlusive lesions between 25 and 58% in patients postcardiac arrest without ST-elevation on ECG,[2] whereas this study population was found to be only 5%. This low rate of culprit lesions reduces the number of patients who could potentially benefit from early PCI, further evidenced by the study PCI rate of only 30% after angiography.
- Performed in one country in Europe
- Did not examine neurologically intact survival as a primary outcome, although it was examined as a secondary outcome
- Blinding was not possible due to nature of the intervention
- Differences between time to targeted temperature management may have been a confounding factor

CONTEXT

This is the first randomized controlled trial comparing immediate versus delayed coronary angiography after cardiac arrest without ST-elevation. The results will be valuable in determining the urgency of angiography after cardiac arrest. Currently, there are two additional randomized controlled trials ongoing within a North American context to solidify or refute these results and expand on the generalizability of this research.[3]

BOTTOM LINE

This study showed no difference between these two strategies with respect to the primary outcome of 90-day survival. There are several limitations related to the external validity of these results, and additional trials to confirm or refute these results are ongoing. Emergency physicians should be aware of the results of this study to facilitate informed conversations with consultants. Clinical judgement should still be used until more generalizable evidence is available and emergency physicians should advocate for their patients to receive timely and appropriate care.

Key words: Cardiac arrest, coronary angiography, percutaneous coronary intervention

Competing interests: None declared.

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