

## RESEARCH NEWS

# Atrial fibrillation after cardiac surgery: rate or rhythm control?

**H.J. Avis**

Department of Anaesthesiology, Academic Medical Center, Amsterdam, the Netherlands

## Correspondence

H.J. Avis – h.j.avis@amc.uva.nl

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*'The art of medicine consists in amusing the patient while nature cures the disease.'*

Voltaire

In the section 'Research News,' we review recent papers relevant for critical care medicine. Clinical implications of the results of these studies will be discussed. In general, authors for this section will be invited by the NJCC. Should you, however, feel tempted to contribute to a future edition, inquiries can be sent to a.p.vlaar@amc.uva.nl.

**Article: Rate control versus rhythm control for atrial fibrillation after cardiac surgery. Published in the New England Journal of Medicine, April 2016.<sup>[1]</sup>**

**Why was this research done?**

Atrial fibrillation (AF) complicates heart surgery in 20-50% of cases. Its occurrence is associated with adverse outcomes including death, longer hospital stay, stroke, circulatory insufficiency, and increased healthcare expenses. Thus, new-onset AF after cardiac surgery is both common and clinically relevant. Nonetheless the optimal treatment strategy is unknown. Basically, there are two approaches with respect to the management of the clinically stable patient with postoperative AF. The first approach aims for normalisation of the heart rhythm by prescribing antiarrhythmic drugs and/or performing direct-current cardioversion, also known as rhythm control. The second approach aims to normalise the heart rate by administering negative chronotropic drugs, known as rate control.

**What was the research question?**

The authors sought to compare treatment of new-onset AF after heart surgery with amiodarone and/or direct current cardioversion (rhythm control), versus treatment with negative chronotropes such as beta-blockers, calcium antagonists, and

digoxin (rate control). The primary endpoint was the total number of days spent in the hospital, assessed two months after randomisation by intention-to-treat analysis.

**How was this investigated?**

In this multicentre randomised controlled trial, 2109 patients without AF were enrolled before they were exposed to elective heart surgery for coronary artery disease (40%), heart-valve disease (40%), or both (20%). Of 695 (33%) patients who developed postoperative AF that persisted for >24 hours or recurred within one week after surgery, 523 were randomised in equal proportions to a rate or rhythm control strategy as described above. Randomised subjects were predominantly male (76%) with a mean age of 69 years.

Physicians were allowed to switch patients who were initially randomised to rate control to a rhythm control strategy if deemed necessary to improve their haemodynamic status or to alleviate symptoms. Discontinuation of amiodarone was allowed when side effects occurred. The study protocol recommended to treat those with AF that persisted or had recurred 48 hours after randomisation with warfarin to prevent thromboembolic complications.

**Main findings**

Length of hospital stay was similar between patients with new-onset AF after heart surgery randomised to a rhythm and a rate control strategy (median 5 days in both groups,  $p=0.76$ ). Also, mortality, complication rates, readmission (including those for AF) and the prevalence of persistent AF did not significantly differ between the treatment groups, although the study was not powered for these outcomes. The authors conclude that neither treatment strategy showed a net clinical advantage over the other.

A notable finding in the study is that in both treatment groups about a quarter of the patients deviated from the assigned therapy, and were switched to the alternative treatment

approach at the discretion of the treating physicians. This was primarily due to drug ineffectiveness in the rate control group, and due to amiodarone intolerability in the rhythm control group.

Sixty days after randomisation, sinus rhythm for at least 30 days was present in 94% and 98% of patients randomised to rate and rhythm control respectively ( $p=0.02$ ). From discharge to 60 days, these percentages were 84% and 87% ( $p=0.41$ ).

### Consequences for daily practice

This well-conducted randomised trial shows that in patients with new-onset AF after heart surgery, rate and rhythm control are both acceptable strategies. Hence, clinicians are still left with multiple options when faced with this complication. We may choose the simple initial strategy of pharmacological rate control, avoiding amiodarone-associated side effects, at the expense of a slower resolution of AF and a greater need for anticoagulation therapy and subsequent bleeding risk. On the other hand, we may accept the side effects of amiodarone and anaesthesia for electrocardioversion, to be rewarded with faster resolution of AF and less need for anticoagulation therapy.

The most important limitation of the study is that it was not powered to detect differences in clinical outcomes such as thromboembolic complications and bleeding. Much larger

future studies, designed to assess these differences, may reveal the best trade-off between advantages and side effects of rate versus rhythm control strategies.

In a recent interview, the first author claims that the choice of strategy can be determined by what is clinically preferable for the individual patient, and that the best treatment of post heart surgery AF is to give it time to wear off. Indeed, whatever the treatment assignment had been in the study, over 90% of patients were without AF after two months of follow-up. Cardiac electrophysiologist John Mandrola rightly quoted Voltaire in connection to the findings of this study: *'The art of medicine consists in amusing the patient while nature cures the disease'*.

### Disclosures

The author declares no conflict of interest. No funding or financial support was received.

Article information: the section Research News represents the opinions of authors and the NJCC and not those of the NVIC.

### References

1. Gillinov AM, Bagiella E, Moskowitz AJ, et al. Rate Control versus Rhythm Control for Atrial Fibrillation after Cardiac Surgery. *N Engl J Med*. 2016. Electronic publication ahead of print: DOI: 10.1056/NEJMoa1602002.