

Cardioversion of atrial fibrillation revisited

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SCIENTIFIC AND SOCIETAL IMPACT

Atrial fibrillation (AF) is the most commonly encountered arrhythmia in adults worldwide¹ and causes a significant health care burden.² In the Netherlands over 360.000 people are diagnosed with AF, and each day 94 patients present to the hospital with AF.³ The current comprehensive management approach for AF focuses on alleviation of symptoms and prevention of serious adverse events.¹ To alleviate symptoms rate or rhythm control treatment can be initiated or adapted. A rate control strategy primarily focuses on symptom relief by reducing the ventricular heart rate with rate control drugs, while rhythm control can be achieved by pharmacological (PCV) or electrical cardioversion (ECV).¹ The central question in this thesis is whether the cardioversion strategy should be revisited. One of the most important conclusions concerning this question derives from the RACE 7 ACWAS trial (**Chapter 4**). This trial showed that a wait-and-see approach (with initial rate control to alleviate symptoms and delayed cardioversion only if needed at 48 hours) is non-inferior to early cardioversion (PCV or ECV) in terms of reaching sinus rhythm at four weeks and obviated the need for cardioversion in almost 70% of patients. This trial has a major scientific impact since it has led to a revisit of the cardioversion guidelines for recent-onset AF, which now includes a wait-and-see approach as alternative option for patients with stable recent-onset AF. Besides the scientific impact of this trial, it has several societal aspects. First of all, in almost 70% of patients a cardioversion -along with its potential complications - may be avoided. Secondly, the time spent in the often overcrowded emergency departments may be reduced. Thirdly, patients may have the experience that their arrhythmia terminated by itself, which may broaden their insight into treatment options and may improve self-management. Fourthly, although not statistically significant there is a trend towards lower costs.

Besides this, also the first part of the thesis, which focuses on identifying patients with a high likelihood of spontaneous conversion, has a societal impact. Since, identification of patients in an early stage could prevent hospital visits (and thereby healthcare costs), and may improve self-management. In the last part of the thesis the future perspectives and the role of remote heart rate and rhythm monitoring for AF are discussed. The exact scientific and societal impact will be investigated in the on-going trials (RACE 9 Observe-AF; TeleCheck-AF) although there are some preliminary results. In recent years many mHealth solutions have become available for heart rate and rhythm assessment, but no infrastructure was available for remote heart rate and rhythm monitoring which also allows instantaneous treatment decisions. We developed such mHealth infrastructure which is based on 1-lead ECG or photoplethysmography (PPG) technology, and the first results (**Chapter 10**) confirmed that this infrastructure is feasible, convenient to use, broadly accessible and relatively low in costs. In the on-going RACE 9 Observe AF trial we are combining this infrastructure with a new watchful-waiting approach for patients with recent-onset AF. This watchful-waiting strategy (rate control to obtain symptom control and only if needed an elective ECV after 4 weeks) will evaluate the need for cardioversion in patients with recent-onset AF. The hypothesis is that the implementation of this watchful-waiting strategy managed by remote rhythm monitoring for recent-onset AF will obviate the need for cardioversion, improve resource utilization in emergency departments, and reduce costs. And since AF is a chronic disease, this remote mHealth infrastructure as well as the watchful-waiting strategy may also improve patient education about the recurrent and transient nature of AF. Also, having the opportunity to communicate 'on-line' with their care team may reduce patients' anxiety and broaden their insight into treatment options. The exact scientific and societal impact will be investigated in the RACE 9 Observe AF trial and the TeleCheck-AF project.



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