EDITORIAL

Rhythm control strategies for "symptomatic" persistent atrial fibrillation: is achieving sinus rhythm enough?

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A significant proportion of symptomatic patients who undergo DC cardioversion for persistent atrial fibrillation are unable to correctly perceive their rhythm shortly afterwards. Restoration of sinus rhythm does not necessarily result in improvement in symptoms

Atrial fibrillation, the most commonly encountered cardiac arrhythmia, is managed by physicians across the board, including primary care, general (internal) medicine, cardiology and cardiac electrophysiology. For all concerned, the goal is to reduce or abolish symptoms and minimise the risk of serious complications including thromboembolism and tachycardia cardiomyopathy. There remains some debate over the most appropriate strategy to achieve these goals, particularly when considering the high likelihood of atrial fibrillation recurrence, the potentially detrimental effects of antiarrhythmic medication, and the apparent lack of mortality and quality of life benefits of rhythm control strategies in selected, older patients.^{1–2} Atrial fibrillation, when symptomatic, may cause palpitations, dyspnoea, fatigue, chest pain or dizziness. Rhythm control strategies, including direct current (DC) cardioversion, aim to abolish such symptoms by the restoration and maintenance of sinus rhythm. There is often an assumption behind this approach that a patient's symptoms are a result of the arrhythmia.

PATIENTS' PERCEPTION OF THEIR RHYTHM

In this edition of *Heart*, the study by Nergårdh and Frick takes a novel look at a widely used rhythm control strategy by examining patient's perception of their rhythm and symptoms one week and four weeks after DC cardioversion.³ The 356 patients studied had persistent atrial fibrillation, a mean age of 68 years, were mainly male, with two thirds having associated cardiac disease and one third having lone atrial fibrillation. Although they were all described as symptomatic, we do not know what these symptoms were. Only 2% were taking amiodarone and all medication was continued for the duration of the study. At one week 38% had already suffered a recurrence of atrial fibrillation.

Although there was fair agreement between the perception of sinus rhythm and sinus rhythm on the ECG, there was poor agreement between those who perceived they had relapsed back into atrial fibrillation and the presence of atrial

fibrillation on the ECG. Put another way, of those that were in sinus rhythm one week after treatment, only 59% could perceive that they were, 32% were unsure, and 9% thought they were still in atrial fibrillation. Of those that had relapsed back into atrial fibrillation, 26% perceived correctly that they were, 53% were unsure and 21% thought incorrectly that they were in sinus rhythm. Only 53% of patients felt their symptoms were better one week after their cardioversion. Of those, three-quarters were in sinus rhythm, indicating a fair agreement between symptoms and rhythm, but one quarter were back in atrial fibrillation. There was also a fair agreement between feeling no different and remaining in atrial fibrillation.

Importantly, there was a strong association between perceived sinus rhythm and improvement in symptoms as well as between perceived atrial fibrillation and worsened or no difference in symptoms. By four weeks nearly half of a subgroup of 93 patients had relapsed back into atrial fibrillation. By this stage there was a better agreement between perception of sinus rhythm and presence of sinus rhythm on ECG (although patients may have been influenced by being informed of their rhythm at the one week visit) and a strong association between sinus rhythm perception and improvement in symptoms.

SYMPTOMS OF ATRIAL FIBRILLATION

Why should some symptomatic patients with persistent atrial fibrillation undergoing cardioversion be unable to perceive changes in their rhythm, and why does the restoration of sinus rhythm fail to result in an improvement in symptoms in a significant minority? Factors that result in atrial fibrillation causing symptoms are poorly understood. Approximately 21–30% of patients with atrial fibrillation are asymptomatic, yet a proportion have rapid ventricular rates and may eventually develop tachycardia cardiomyopathy.⁴ The most common symptom in patients with paroxysmal atrial fibrillation is palpitations, occurring in 79%, yet even those with symptomatic paroxysmal atrial fibrillation have a ratio of asymptomatic to symptomatic episodes of 12 to 1.^{5–6} On the other hand, one third of symptomatic episodes in patients with paroxysmal atrial fibrillation may occur in the setting of sinus rhythm.⁷

The most common symptom in patients with persistent atrial fibrillation is dyspnoea, with only 47% complaining of palpitations.⁵ Perhaps accurate perception of heart rhythm is dependent upon the precise nature of the symptoms, with those who complain of palpitations more able to

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perceive changes in their heart rhythm following cardioversion? Certainly, patients with rapid ventricular rates are more likely to be symptomatic.¹⁻⁴ Some symptoms attributed to atrial fibrillation, such as dyspnoea and fatigue, may actually be the consequence of co-existing medical conditions. Hypertension, valvular heart disease, chronic lung disease and ischaemic heart disease are commonly found in the atrial fibrillation population and symptoms resulting from these may not be influenced by the restoration of sinus rhythm.

It is notable that in the study by Nergårdh and Frick,³ patients with lone atrial fibrillation were better at perceiving their rhythm than those with co-existing heart disease, as presumably atrial fibrillation was the sole cause of their symptoms. The authors also correctly point out that some of the benefits of DC cardioversion may not be immediate. Recovery of atrial contractile function may take a few weeks following cardioversion and some symptoms (fatigue, dyspnoea) and consequently rhythm perception may take time to improve.

What is more challenging to explain is why 21% of patients who had relapsed back into atrial fibrillation by one week felt they were still in sinus rhythm, and one quarter said their symptoms had improved. Patients undergoing cardioversion will be informed of the risks and benefits of the procedure as part of the consent process. They will have anticipated an improvement, particularly as the immediate success rate at restoring sinus rhythm is close to 100%. Some may have undergone previous cardioversion with transient improvement, predisposing them to an expectation of sinus rhythm and a similar improvement. The positive "placebo-effect" of interventional procedures that fail to alter cardiac function has previously been demonstrated with cardiac resynchronization pacing and percutaneous myocardial revascularisation.⁸⁻⁹ It is not surprising therefore that the belief that sinus rhythm has been restored is strongly linked with improvement in symptoms.

PREDICTING A RESPONSE TO SINUS RHYTHM RESTORATION

How can we apply the findings of Nergårdh and Frick in ongoing clinical practice? Not only is there a high recurrence rate following DC cardioversion of atrial fibrillation, but a proportion of patients who do regain sinus rhythm will fail to have symptomatic improvement. A better understanding of the nature of an individual's symptoms, particularly in relation to co-existing conditions, may help predict response to the restoration of sinus rhythm and dictate whether a rhythm or rate control strategy should be advised. Those who are unaware they have relapsed back into atrial fibrillation following cardioversion may subsequently be treated with a

rate control strategy. Confirmation that transient restoration of sinus rhythm is correlated with improvement in symptoms may encourage continued attempts at rhythm control—for example, repeated DC cardioversion with amiodarone pre-loading and maintenance. Left atrial catheter ablation is now promoted as a therapy for persistent as well as paroxysmal atrial fibrillation, including patients with heart failure and valve disease.¹⁰⁻¹¹ Symptomatic improvement following DC cardioversion, when associated with a transient restoration of sinus rhythm, may be a relatively simple way of selecting those patients with persistent atrial fibrillation who are most likely to benefit from such catheter ablation procedures.

A final note of warning is that patient perception of rhythm and symptoms should not be used as a reliable guide to the presence of sinus rhythm and the subsequent cessation of anticoagulant treatment. As a significant proportion of patients relapse back into atrial fibrillation following DC cardioversion, yet perceive they are still in sinus rhythm and report that their symptoms have improved, ECG evidence of sinus rhythm should be gained after an appropriate time period before considering withdrawal of warfarin.

Conflicts of interest: none

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