Quality of life in atrial fibrillation: relevance of the autonomic nervous system

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Quality of life is now accepted as being as clinically important as, for example, exercise capacity or even mortality in atrial fibrillation patients. The growing interest of the scientific community in the quality of life aspects of atrial fibrillation is a late recognition of clinicians’ experience in recent decades: patients with symptomatic atrial fibrillation undergo invasive therapies, such as atrioventricular node ablation and permanent pacemaker implantation, long-term amiodarone therapy or radiofrequency catheter ablation procedures, primarily not to improve their survival but their daily life performance. In contrast to the fact that quality of life is a key issue in clinical practice, the currently available data from adequately designed studies is still very limited and needs to be enlarged. The assessment and quantification of quality of life, as defined by the World Health Organization (‘an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person’s physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment’) requires a multidimensional approach.

Impairment of quality of life in atrial fibrillation

In atrial fibrillation, quality of life assessment consists of objective criteria, such as haemodynamic variables, including rapid ventricular response and hypotension with secondary end-organ ischaemia, or subjective criteria such as physical function, psychological well-being, social activity or activities of daily living[1]. Subjective quality of life can be measured with a disease-specific or a generic instrument, for example the Medical Outcome Study — Short Form Health Survey, which fulfils stringent criteria of reliability and validity on conducting assessments of general health and comparison between disease states or different disease groups. The Medical Outcome Study — Short Form (MOS-SF), includes 36 questions and yields an eight scale health profile (limitations of physical activities, limitations in social activities, limitations in usual role activities because of physical health problems, bodily pain, general mental health, limitations in usual role activities because of emotional problems, vitality and general health perception) as well as a summarizing measurement of quality of life. This test was used by van den Berg and colleagues, who investigated 73 patients with symptomatic paroxysmal atrial fibrillation and an age-matched control group in terms of autonomic function, symptomatology and quality of life[2]. One of the major findings of the study is that, in comparison to the control group, patients with atrial fibrillation had significantly lower scores in seven of the eight subscales of the SF-36 questionnaire, indicating a significant impairment of quality of life. The SF-36 scores of atrial fibrillation patients were particularly low in physical role function, emotional role function, vitality and general health, whereas the pain subscale, as expected, did not exhibit any difference compared to the control group. However, before this finding was transferred to clinical practice, several limitations have to be considered.

The study was performed in a tertiary referral centre with highly selected patients. The demonstrated amount of quality of life impairment therefore does not necessarily represent the atrial fibrillation patient group in a primary or even secondary care centre. In addition, the cross-sectional design of this study is a further limitation; a longitudinal study would provide more reliable data by compensating for spontaneous variation in quality of life[3]. This aspect is underlined by the fact that it is not clear how many of the patients were in atrial fibrillation while completing the questionnaire, which might have an impact on their grading. A longitudinal study design with at least two or more ‘check-dates’ could reduce the impact of such ‘chance findings’ and should be the design of choice even when therapy effects are not investigated.

A few more aspects have to be considered. It is not clear from the paper by van den Berg et al[1] whether the control group consisted of only age-matched healthy normals or included a disease-matched group of patients without atrial fibrillation. Even if the number of patients with idiopathic atrial fibrillation was quite high (59%), the underlying cardiovascular disease in 41% of patients may, at least in part, be responsible for the observed reduction in quality of life. Furthermore, as properly discussed by van den Berg et al[1], the presence of a primary affective disorder, such as endogenous depression, which might have attenuated the quality of life score before any occurrence of atrial arrhythmias led to a change in autonomic nervous function, subsequently facilitating paroxysmal atrial fibrillation.

The majority of patients had been on antiarrhythmic drugs for atrial fibrillation prevention. Aside from a...
change in autonomic function in such patients, quality of life may be impaired by the medication itself and not by the arrhythmia. While considering these limitations of the study of van den Berg et al,[3], the message remains clear and remarkable: in selected symptomatic patients, atrial fibrillation significantly reduces quality of life.

Predictors of quality of life

The assessment of symptomatology, focusing on sympathetic-related symptoms and autonomic function testing as possible determinants of quality of life in atrial fibrillation is the most interesting and unique aspect of the study of van den Berg et al,[1]: vitality, for example, as measured by the SF-36, was preserved in vagal atrial fibrillation and reduced in those with a poor response to deep breathing or beta-blocker treatment. Physical role function was unchanged as compared to the control group in patients with high baroreflex sensitivity or a low incidence of atrial fibrillation paroxysms, whereas chest pain and dizziness during atrial fibrillation were found to be associated with an impairment of this parameter. Severe perspiration could be correlated to poor general health and impairment of the emotional role function.

While interpreting these data and the role of the autonomic nervous system in atrial fibrillation we face the classical problem of ‘priority’ or ‘the chicken/egg dilemma’. It is well known that the autonomic nervous system is a relevant trigger factor for atrial fibrillation, for example in vagal atrial fibrillation or exercise-induced, adrenergic-triggered atrial fibrillation. Aside from arrhythmia induction, the autonomic nervous system is involved in generating an adequate haemodynamic response to acute cardiovascular changes during atrial fibrillation, such as heart rate rise or vasoconstriction to compensate for a sudden drop in blood pressure. Therefore, it is likely that an intact autonomic response to atrial fibrillation paroxysms is a prerequisite to avoid symptoms and possibly a reduced quality of life. However, the autonomic nervous system not only leads to atrial fibrillation or reacts on its occurrence, it can also be modified by atrial fibrillation itself via changes in haemodynamics.

Outlook for the clinician

Even when we have to accept that the correlation of atrial fibrillation with the autonomic nervous system is a very complex relationship, the reported result that, in general, symptoms during paroxysms of atrial fibrillation and a depressed vagal function were significantly predictive of an impaired quality of life, is of importance. The indication to treat atrial fibrillation is related to the prevention of stroke, to avoid haemodynamic deterioration in patients with depressed left ventricular function, to protect from tachycardiomyopathy in tachyarrhythmic atrial fibrillation or to reduce symptoms and improve quality of life. As it is not yet clear if we improve survival by maintaining sinus rhythm using antiarrhythmic drugs, reduction in symptoms and an improvement in quality of life are the most important reasons for treating patients with idiopathic or hypertension-related atrial fibrillation[9]. The use of an antiarrhythmic drug to maintain sinus rhythm under these conditions should be performed on a patient-specific basis; drugs are either selected following a mechanistic approach, e.g. treatment of the autonomic trigger using beta-blockers for adrenergic atrial fibrillation, or determined by the underlying cardiac disease and status of left ventricular function[5]. Aside from treating an autonomic trigger, the effect of different antiarrhythmic drugs or even chronic cardiac pacing on the autonomic function in general, or their impact on a patient’s individual autonomic profile are not yet adequately considered in the treatment or drug-selection algorithms. According to the results of van den Berg et al,[1], one could hypothesize that the drug-specific modulation of the autonomic system or the patient’s autonomic characteristics may become an important selection criteria in atrial fibrillation therapy. In future there might even be a role for drugs or pacing manoeuvres serving predominantly as ‘autonomic modulators’ with no or only mild ‘true’ antiarrhythmic effects on atrial fibrillation.

The results of the study of van den Berg et al,[3] help us to develop a better understanding of why quality of life is different among patients according to their individual autonomic status and symptomatology. Further research has to be performed to elucidate the role of autonomic function and symptomatology as predictors of quality of life in atrial fibrillation before the individual’s ‘autonomic fingerprint’ may be used as a major criterion for therapy selection to suppress symptoms and improve quality of life.

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References
