The epidemiological burden of atrial fibrillation: a challenge for clinicians and health care systems

Giuseppe Boriani*, Igor Diemberger, Cristian Martignani, Mauro Biffi, and Angelo Branzi

Institute of Cardiology, University of Bologna, Policlinico S. Orsola-Malpighi, Via Massarenti 9, 40138 Bologna, Italy

Online publish-ahead-of-print 16 March 2006

This editorial refers to "Prevalence, incidence and lifetime risk of atrial fibrillation: the Rotterdam study" by Heeringa et al., on page 949

There is increasing awareness that management of atrial fibrillation (AF) and its complications (particularly strokes) constitutes an important burden for health care systems and a major clinical challenge. AF is the most common sustained arrhythmia, and detailed knowledge of its epidemiology is important both for provision of adequate care and for resource allocation. Available epidemiological studies have mainly focused on prevalence of AF. Important frequency variations have been recorded, often linked to different detection procedures. Most of what we know about the incidence of AF in the general population comes from two large North American studies and a single study from Britain mostly regarding hospitalized patients. Thus, the new population-based cohort study by Herringa et al. on the epidemiological profile of AF in Rotterdam is highly relevant. This work, based on almost 8000 inhabitants of (a suburb of) Rotterdam aged at least 55 years at enrollment, provides a valuable picture of the age-specific prevalence and incidence of AF, as well as the lifetime risk of developing this clinically challenging arrhythmia.

The Rotterdam study suggests that sex-age-specific incidence increases progressively before peaking at around 80 years. This result fits well with the main available data on incidence of AF, which are summarized in Figure 1. The high reported lifetime risk of developing AF (around 23–25% at the age of 55 years) is broadly in keeping with recent results from the Framingham study. Moreover, the present article as well as all the main available epidemiological studies indicate that in both men and women AF burden, in terms of prevalence of arrhythmia, progressively increases until advanced old age. In general, the findings of the new study suggest that very strong similarities in the epidemiology of AF exist between North America and Europe. Although the authors understandably limit the discussion of their work to comparative epidemiological considerations, their findings prompt broader considerations both from the clinical and public health perspectives. One implication of their findings is that in the light of the progressive ageing of the general population, Europe too seems set to face an 'epidemic' of AF in terms of prevalence in the overall population. It also has to be borne in mind that all the available epidemiological studies probably underestimate the true disease burden, as some asymptomatic cases inevitably go undetected (and silent AF can have major clinical consequences).

Some clues on the entity of the public health burden of AF in the coming years are provided by a projection study regarding the United States, which suggested an increase in the number of persons with AF from around 2.3 million at present to more than 5.6 million by the year 2050, when over half of the affected individuals will be over 80 years of age. Considering the increase in hospitalization rates because of AF that have already been observed and the overall cost of AF management (estimated to be at present around €3000 per patient/year in France) similar scenarios will imply heavy financial burdens for our health care systems. Timely reflections are required regarding public health strategies and clinical management, as well as research perspectives.

Clinically, AF is a multifaceted disease. Clinicians are confronted by a wide spectrum of situations, ranging from cases where AF is the disease itself (e.g. recurrent paroxysmal AF in an otherwise healthy subject) to cases where it is an important manifestation of severe diseases of the heart or other organs (kidney, lung, etc.). The wide heterogeneity of the clinical context in which AF develops (ranging from ‘lone AF’ to AF in the setting of severe heart failure), the varying impact on patients’ lives (from asymptomatic to poorly tolerated), and the different age distribution (from youth to advanced old age) all call for a personalized approach to its management. Such an approach would entail selection, in accordance with the clinical setting and the needs of individual patients, of appropriate rhythm-control or rate-control strategies (involving anti-coagulation, antiarrhythmic drugs, cardioversion, substrate ablation, ablate and pace, etc.) for reasonable objectives (increasing life expectancy, improving quality-of-life, relief of symptoms, limiting hospitalizations, stroke prevention, etc.) involving a sustainable consumption of financial resources. A young woman with lone AF clearly requires a completely different approach with respect to an elderly...
man with coronary artery disease associated with renal failure and previous stroke. But how about the case of a middle-aged patient with suspected tachycardia-induced cardiomyopathy, where it is unclear whether heart failure is the consequence or the cause of AF (the classic chicken–egg dilemma)?

To confront the wide range of clinical settings of AF, we will need to be in a position to select appropriately from a broad array of treatments of varying complexity, on the basis of the profile and characteristics of the individual patient. For the more sophisticated, complex, and costly treatments, careful patient targeting will be required to ensure appropriate use of clinical resources. Moreover, in view of the wide variety of patients who are (and will be) affected by AF it is clear that a rational approach to clinical management will involve several specialties (not only cardiologists, internists and general practitioners, but also geriatricians, neurologists, anaesthetists and emergency physicians). Close collaboration, common guidelines, and clinical pathways will be required to deliver appropriate care.

The epidemiology of AF may also be relevant to evaluations of the efficacy and effectiveness of different therapies in specific contexts. In the light of the age-dependency of AF, we think that some caution is needed before making claims, based on just a few years of follow-up, that a given treatment administered at a specific age can provide a permanent ‘cure’. Registry studies with long follow-up durations could allow assessment of the natural and ‘unnatural’ histories of the disease following different therapeutic approaches.

The relevance of AF seems to have been underappreciated for many decades. However, greater interest has now been kindled. AF is becoming a more frequent focus of attention, with a roughly seven-fold increase in the number of articles listed in PubMed with AF as a major topic heading in the last 15 years (four times greater than the overall rise in listed publications over the same period). Perhaps the time has come to give greater attention to the epidemiological profile of AF in our research strategies. One major challenge could be primary prevention.

In view of the expected increase of disease burden in the coming decades, a shift in our approach towards identification of effective strategies for preventing initial onset of AF could turn out to be a wise investment for our health care systems.

Acknowledgement

We are grateful to Robin M.T. Cooke for writing assistance. No grant support.

Conflict of interest: none declared.

References