Atrial fibrillation—the growing epidemic

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For many years, atrial fibrillation (AF) was regarded as a trivial condition, but it is now increasingly recognised that the presence of AF in itself is an independent contributor to mortality, morbidity and impaired quality of life.^{1,2} We know that AF is the most common sustained cardiac arrhythmia, which affects approximately 1.0–1.5% of the general population, and has a projected incidence that is markedly increasing.³ In the UK, AF presently accounts for 0.97% of the total National Health Service expenditure⁴—an expensive figure that will also presumably continue to spiral.

On the basis of census projections, earlier data estimated that approximately 3 million individuals in the US will have AF by 2020, perhaps increasing to 5.6 million by 2050, with >50% of these patients aged >80 years.⁵ This may be an underestimate, as more recent studies confirm that the prevalence of AF continues to increase; indeed, Miyasaka *et al*³ project that 15.9 million people in the US will have AF by 2050.⁵ These data provide a warning of the “epidemiological timebomb” that awaits the physicians of the future. AF is certainly the new “epidemic”.

Why is AF on the increase? Although advancing age is often cited as the primary reason for the AF epidemic, other possibilities exist and it is likely that the true explanation is, in reality, multifactorial.⁶ The current trend of aggressive primary and secondary cardiovascular prevention, combined with advances in the management of many chronic diseases and improved socioeconomic prosperity, has perhaps resulted in an elderly population that is in some ways sicker than would have been the case previously.^{7–9} Moreover, the better management of myocardial infarction has resulted in a great improvement in survival, the net result being a greater prevalence of left ventricular dysfunction (particularly among elderly patients), and AF and heart failure commonly coexist. Others have postulated that “diseases of the West”, such as sleep apnoea, obesity and metabolic syndrome, have had a direct influence on the occurrence of AF, although in many cases the link remains tenuous.⁹ It is worth remembering that many episodes of AF remain undetected, especially if asymptomatic, and that AF may be an incidental finding in 30–45% of patients who had an electrocardiogram for unrelated reasons.^{8,9} Thus, the predictions of growth of AF may be a substantial underestimate.

Perhaps the epidemic of AF may simply reflect the natural history of one's cardiac rhythm. In the

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Framingham study,¹⁰ a 1 in 4 lifetime risk of developing AF for those >40 years of age was reported for both sexes.¹⁰ This was confirmed in the Rotterdam study, where the lifetime risk of developing AF at the age of 55 years was 23.8% in men and 22.2% in women.¹¹ In those without prior or concurrent congestive heart failure or myocardial infarction, lifetime risks for AF were still approximately 16%.¹⁰

In this issue of *Heart*, Murphy *et al*¹² report a national survey of the prevalence, incidence, primary care burden and treatment of atrial fibrillation in Scotland. Information was analysed using the continuous morbidity recording scheme, which prospectively covers information from general practitioners regarding patients' age, sex, social deprivation and rural/urban mix, thus allowing accurate estimation and analysis of the trends of AF prevalence, incidence, referrals and treatment. In keeping with other conservative worldwide and UK estimates of AF prevalence, Murphy *et al*¹² found a total prevalence of 8.4/1000, which was higher among men (men 9.4/1000 vs women 7.9/1000). As expected, a strong relationship was found with advancing age, with a prevalence of 0.3/1000 in those aged <45 years, rising to 70.3/1000 in those aged >85 years. Interestingly, these investigators found a lower prevalence of AF in those with the greatest degree of socioeconomic deprivation, when compared with the more well-off. Although this potentially reflects a poorer rate of detection in this group (indeed, the lowest socioeconomic group had the least contact with their general practitioner), it is well known that these patients also tend to have a greater incidence of established risk factors for AF, such as heart disease, hypertension, obesity and atherosclerosis.¹³

The implications of the AF epidemic merit some discussion.¹⁴ Numerous studies have shown the negative impact of AF on quality of life,¹ and AF remains a potent risk factor for thromboembolism, accounting for approximately 15% of all thromboembolic strokes.¹⁴ Often overlooked is the fact that comorbid factors such as hypertension, diabetes mellitus, congestive heart failure and prior stroke, all serve to increase the risk of stroke in AF, and the risks are cumulative.¹⁵ Importantly, each of these risk factors is more common in the elderly, and, with the rapidly advancing age of Western populations, the incidence of stroke may mirror that of AF and will continue to rise. Nonetheless, there is good evidence from clinical trials supporting the use of oral anticoagulant treatment for stroke prevention in AF.¹⁶ The

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Abbreviation: AF, atrial fibrillation

challenge of optimising provision of thromboprophylaxis for increasing numbers of patients with AF is still problematic, given the limitations (and risks) of oral anticoagulation with warfarin and the increasing burden on anticoagulation monitoring services. Indeed, Murphy *et al*¹² report that 22% of their patients with AF were not taking any antithrombotic treatment. The epidemic of AF also brings with it management issues in anticoagulation—for example, what is the optimum way of administering antithrombotic treatment in patients with AF with associated coronary artery disease (a common comorbidity) who develop acute coronary syndromes and/or need percutaneous coronary intervention (with stenting, especially drug-eluting stents). In such instances, triple antithrombotic treatment with warfarin, aspirin and clopidogrel involves a fine balance of stroke prevention against the potential risk of recurrent ischaemia and bleeding.¹⁷

Given the epidemic of AF, how can things improve? Better education and understanding is crucial. One important strategy to reduce the burden of AF is to ensure appropriate targeting of antithrombotic treatment, particularly in those at greatest risk. Despite the advent of numerous risk stratification schema,¹⁵ there still seems to be a reluctance to initiate anticoagulation, particularly in those patients deemed at high risk of complications and bleeding events.¹⁸ This leads to low rates of anticoagulation, especially among many elderly patients and those with either a perceived lack of compliance or excessive alcohol consumption. Furthermore, physicians are easily swayed by initial patient preferences, many of whom would prefer not to receive anticoagulation for fear of lifestyle implications or bleeding events.¹⁹ This should still be tempered with the knowledge that many patients perceive a moderate to severe stroke as worse than death.²⁰ Equally, many patients with AF have a limited appreciation of the disease process and the need for anticoagulation, which can be improved by educational interventions.²¹ The epidemic of AF would therefore need a corresponding provision of anticoagulation services, and education programmes.

Can the healthcare system cope with the growing economic burden presented to it by AF and its complications? This is a difficult question, but one that will increasingly need to be considered given the spiralling costs of both anticoagulation service provision and stroke management. Management inconsistencies have been helped by clinical management guidelines, such as the recent evidence-based National Institute for Health and Clinical Excellence guidelines on AF management.²² However, limitations still remain, for example, in the availability of safe and effective antiarrhythmic drugs, with a low risk of proarrhythmia.

Technological advances in non-pharmacological approaches, particularly in catheter-based techniques, have offered the premise of a definitive curative treatment for AF.²³ Current provision for AF ablation in many countries may be unable to cope with the AF epidemic, and real world results may be less than optimal, with a significant early relapse rate (that varies with centre experience and duration of follow-up).²⁴ Although AF ablation is easily justified in those who are symptomatic and/or have failed medical treatment, the impact of such procedures on the overall prevalence and economic burden of AF is likely to remain small. The role of upstream therapies—such as renin-angiotensin-aldosterone system blockade (eg, ACE inhibitors and angiotensin receptor blockers) and statins—could hold some promise on the burden of AF, but recent data on the use of such drugs after AF ablation are less encouraging.²⁵

In conclusion, the epidemic of AF may still remain with us for some more time. The paper by Murphy *et al*¹² re-emphasises that this common arrhythmia is still very evident, and remains

a public health problem. Projections of the increasing burden of AF³ remain depressing and clearly highlight the need for new approaches, both pharmacological and non-pharmacological, to treat this common arrhythmia. Perhaps things can only get better.

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