Atrial fibrillation (AF) is said to be an epidemic, affecting 1% to 1.5% of the population. The arrhythmia presently costs approximately 1% of the health care budget in the United Kingdom and in France. The prevalence is increasing because the population is aging and many older people have survived potential cardiovascular tragedies, leaving them exposed to the more insidious effects of underlying cardiovascular disease. Atrial fibrillation is one result.

Although the arrhythmia carries little direct hazard, the risk of thromboembolism is substantial and increases exponentially with age. Warfarin, but not aspirin, virtually eliminates this risk but carries its own dangers, predominantly hemorrhage. It is difficult to manage therapy with warfarin: full compliance, routine anticoagulation checks, polypharmacy vigilance, alcohol temperature, a consistent dietary regimen and the good fortune not to be involved in any significant trauma are essential but not guaranteed. Only 60% of those who need this therapy are treated.

New anticoagulant strategies are necessary and seemed imminent until a direct thrombin inhibitor, already available in parts of Europe for the reduction of postoperative venous thromboembolism, was refused approval by regulatory authorities for use in atrial fibrillation.

However, almost every big pharmaceutical company is interested in this problem and it will not be long before the thromboembolic risks of AF can be effectively treated without the hazards and inconvenience of warfarin treatment. Antiarrhythmic therapies, particularly amiodarone, sotalol, propafenone and flecainide, are moderately effective at initially reducing the incidence of paroxysms or persistent bouts of AF. Eventually, however, the disease becomes unresponsive, tolerance develops or side effects accumulate. Other therapies are needed.

First surgeons and then physicians isolated the arrhythmia triggers in the pulmonary veins from the remainder of atrial myocardium and prevented recurrence of AF. Although these techniques will help many, it is not yet clear how successful they will prove in the long-term. In any event, the application of such an expensive and technologically demanding procedure to the millions of those who suffer from AF seems unlikely to be realised. Pharmacological, and preferably a preventative strategy is needed to cope with an epidemic.

Efforts to identify such a solution are hampered by our failure to fully understand the mechanism of AF. However, most of the disease seems to stem from other cardiac pathology, much of which we can prevent: hypertension, heart failure and ischaemic heart disease. Even if these diseases cannot be prevented they can be vigorously treated, and the prevalence of atrial fibrillation will fall.

Treatment with statins, antihypertensive therapy, angiotensin receptor blockade (ARBs), angiotensin converting enzyme inhibitors (ACE-Is) and omega-3 fatty acids all seem to provide effective therapy for atrial fibrillation, perhaps over and above any effect related to the treatment of underlying heart disease. For example, an anti-inflammatory mechanism has been proposed for statins, and an anti-fibrotic mechanism for ARBs and ACE-I’s. Thus there may already be some treatments for AF that are not due to other underlying heart disease.

Membrane ion channel antagonists such as Kv1.5 blockers that are relatively specific for the atrial myocardium are now being developed. They may terminate or prevent AF without provoking ventricular proarrrhythmia, but their efficacy is uncertain. A plethora of completely new antiarrhythmic effects are now envisioned: connexin modulation, stretch receptor antagonism, blockade of the sodium calcium exchanger, sodium hydrogen exchange block, late sodium channel inhibition. One or more of these effects may turn out to be ‘just the job’ but if not, others will emerge.

The epidemic of atrial fibrillation and its complications will eventually subside, not today but sometime soon.

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References


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