Management of atrial fibrillation in the elderly

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Introduction

Atrial fibrillation (AF) is the most common cardiac arrhythmia with prevalence increasing with advancing age, occurring in <1% of those under 60 years but more than 6% in those aged 80 and above. The prevalence of AF increases in the presence of structural heart disease (left ventricular hypertrophy, valvular heart disease or ventricular dysfunction). The combination of AF and other cardiac disease is associated with an increase in morbidity and mortality. This paper will discuss the practical management of AF, focusing on AF in older persons.

Terminology

When AF is detected an attempt should be made to classify it into one of three groups as this has implications for further management. *Paroxysmal AF* refers to AF that self terminates. *Persistent AF* includes AF that does not spontaneously terminate (or AF terminated with chemical or electrical cardioversion). *Permanent AF* refers to AF that is resistant to cardioversion, or persistent AF for which cardioversion has not been attempted.

Other commonly used terms include *recurrent AF* which refers to two or more episodes of AF in an individual patient and *lone AF* which is defined as AF which occurs in a person under the age of 60 who has no clinical or echocardiographic evidence of cardiorespiratory disease.

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Epidemiology and prognosis

AF is the most common cardiac arrhythmia, prevalence increasing with age and coexisting cardiac disease. Large cohort studies have shown that prevalence varies from 0.5% in those aged <60 to 8% in those aged >80.[1,2] Morbidity associated with AF arises from symptoms associated with the arrhythmia and from thromboembolism.

Symptoms due to AF

The presence of AF can affect cardiac function in three ways:

1. Loss of 'atrial kick' which may lead to a marked decrease in cardiac output, particularly in individuals with impaired diastolic function or mitral stenosis.
2. The irregular heart rate may directly impair cardiac output.
3. An uncontrolled ventricular rate may lead to tachycardia induced deterioration of ventricular function, which may be reversible once rate control is achieved.

The combination of these three factors in many patients with AF leads to symptoms of fatigue, breathlessness and heart failure. The presence or absence of symptoms is likely to reflect the severity of underlying cardiac disease.

Thromboembolism

The rate of ischaemic stroke in patients with non-rheumatic AF is about 5% per year (two to seven times the

rate for those without AF).[1] The rate of stroke in those with rheumatic heart disease and AF is 17-fold greater than age matched controls,[3] and five times greater than those with non-rheumatic AF[1] emphasising the very high risk in this subgroup. The pathophysiology of thrombus formation in patients with AF is multifactorial, associated with left atrial dysfunction (left atrial appendage stasis), hypertension, and left ventricular systolic and diastolic dysfunction. In addition to the risk of thromboembolism, total mortality rates for patients with AF are twice those who are in sinus rhythm.[4] This increase in overall mortality is predominately related to the severity of underlying heart disease.[4]

Diagnostic evaluation

Once AF is recognised, an attempt should be made to categorise it into one of the three groups discussed above, namely paroxysmal, persistent or permanent. This classification of AF is clinically useful to aid individual patient management decisions (see below).

Minimum initial diagnostic evaluation includes:

1. **Clinical history and physical examination**. A clinical history and examination will allow assessment of the setting in which AF is occurring for the individual patient and allow investigations/therapy to be tailored.
2. **ECG** to confirm diagnosis (if patient in persistent or permanent AF). The ECG may also provide information about underlying conditions which are associated with AF such as left ventricular hypertrophy, prior myocardial infarction, and valvular heart disease.
3. **Blood tests** including thyroid function and haemoglobin level are indicated to exclude thyrotoxicosis or anaemia as a predisposing condition.
4. **Echocardiography** should be considered for patients with a new diagnosis of AF. The role of echocardiography is twofold. It allows identification of structural abnormalities of the heart that may predispose to AF and influence prognosis, such as increased left atrial size, abnormal ventricular function, and valvular heart disease. Also, results of the echocardiogram may influence therapy, for instance the identification of valvular heart disease allows categorisation of a patient into a very high thrombotic risk group. Reversible conditions (such as severe valvular stenosis/regurgitation amenable to surgical correction) may be identified. In some patients, for example, those with severe comorbidity, clinical assessment may dictate an individual patient management strategy and thus echocardiography may not be clinically appropriate in such cases.

Other investigations are guided by the initial history and physical examination for example **chest x-ray** if respiratory pathology is suspected. **Holter monitoring** may be useful to assess rate control or to identify paroxysmal AF. Further specialist investigations may be required, for example if cardioversion is contemplated a **transoesophoegeal echocardiogram** may be particularly useful to identify left atrial appendage thrombus.

Treatment

Treatment of AF comprises two equally important strategies. An assessment of thromboembolic risk and a decision regarding patient suitability for anticoagulation, and consideration of whether to attempt to attain or maintain sinus rhythm (rhythm control) or to control ventricular rate (rate control).

Thromboembolic risk

Ischaemic stroke risk in patients with AF increases with the presence of coexisting cardiovascular disease. Lone AF is associated with an annual stroke rate of 1.3–2.6% per year, whereas stroke rates are greatly increased in older individuals, those with previous stroke or transient ischaemic attacks (10–12% per year), and co-existing cardiovascular disease. Stroke rates are similar in those with recurrent and permanent AF.[5] Stroke risk persists after achievement of sinus rhythm, in the AFFIRM study rates of ischaemic stroke were similar in those assigned to the rate control (5.5%) and rhythm control groups (7.1%), p=0.79), and the vast majority of stroke occurred in people who were not therapeutically anticoagulated.[6]

Several large randomised trials have assessed anticoagulation strategies for primary and secondary pre-

Figure 1. Risks of ischaemic stroke and intracranial bleeding related to the intensity of oral anticoagulation (from AHA/ACC AF guidelines[4])

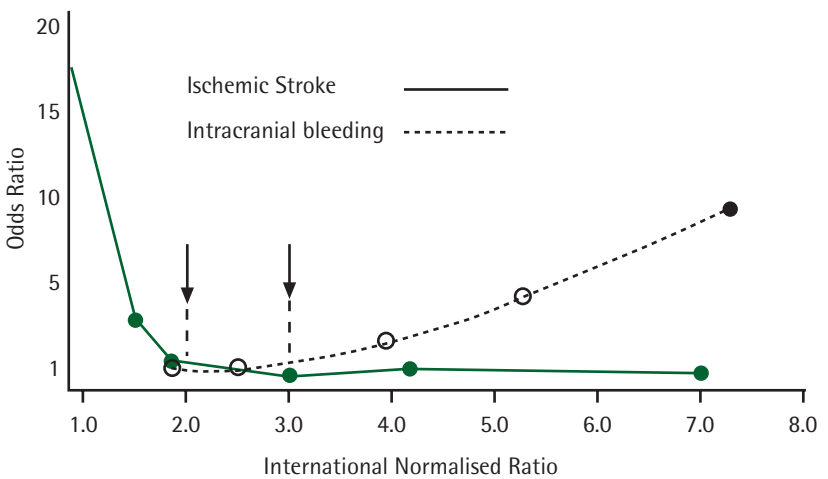
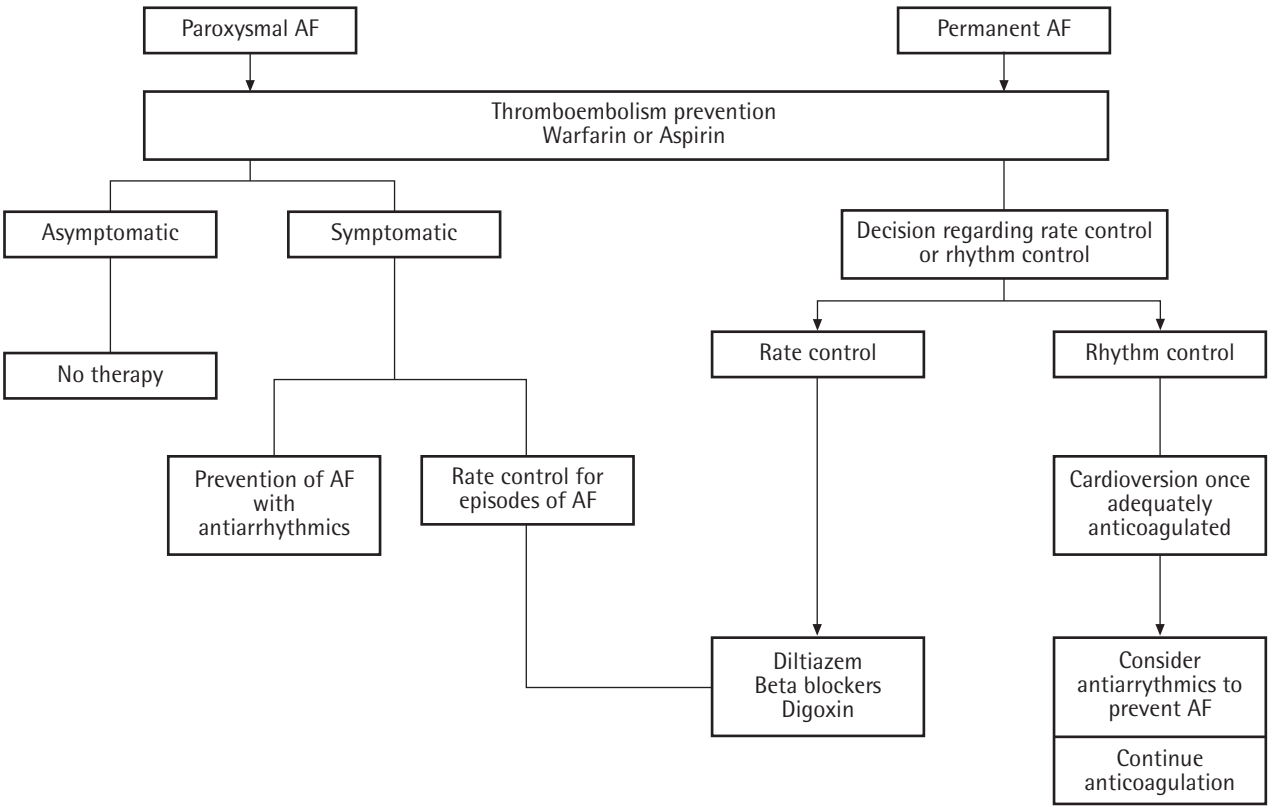


Figure 2: Suggest management strategy for patients with AF



vention of ischaemic stroke in patients with AF. A meta-analysis of these trials has shown that adjusted dose warfarin (target INR 2.0–3.0) was highly effective in the prevention of all strokes (relative risk reduction of 61% compared with placebo). The risk reduction was similar for both primary and secondary prevention.[7] A target INR of 2.0–3.0 offers maximum protection against ischaemic stroke with minimum risk of bleeding, whereas lower INR levels provide sub-optimal efficacy with similar bleeding risk (Figure 1).[4] Aspirin provides less effective stroke prophylaxis than warfarin but is better than placebo.[4] Aspirin may be considered in patients with lone AF as primary prevention. Patients with lone AF on aspirin should have their thromboembolic risk reassessed at intervals and should be considered for warfarin therapy if they develop other important risk factors for thromboembolism.

Decisions regarding antiarrhythmic drug therapy should be made in conjunction with a cardiologist

Anticoagulation should be maintained indefinitely even if patients return to sinus rhythm as the increased risk of stroke persists in the long term.[6] Interruption of warfarin treatment for up to a week is considered safe in those with non-valvular AF (to allow surgical or other procedures), however patients with valvular heart disease should be converted to unfractionated or low molecular weight heparin in the peri-procedure period.[4]

Ximelagatran is an oral direct thrombin inhibitor which is currently being investigated as a warfarin alternative. It has the significant advantage of predictable pharmacokinetics and few drug interactions allowing a fixed twice daily dose without anticoagulation monitoring. The SPORTIF III study randomised 3410 patients with non-valvular AF to treatment with ximelagatran or warfarin. Treatment with ximelagatran was at least as effective as warfarin for prevention of stroke and systemic embolism with a lower rate of haemorrhage. Reversibly raised liver function tests were more common with ximelagatran.[8] Once this drug becomes registered in New Zealand it is likely to become an attractive alternative to warfarin therapy in appropriate patients with AF.

Rate control versus rhythm control

Patients with haemodynamically unstable AF should be considered for hospitalisation for assessment for urgent cardioversion. When AF is identified in a person who is haemodynamically stable, a management plan should be determined with consideration of whether maintenance of sinus rhythm or rate control is the goal of therapy. Once AF has occurred anticoagulation should be continued indefinitely as the risk of stroke persists.

Maintenance of sinus rhythm was previously thought to be a superior management strategy until recent completion of two large randomised controlled trials. The AFFIRM[6] and European[9] studies compared rate and rhythm control approaches in approximately 4500 patients with persistent AF. Both of these studies showed no mortality or morbidity benefit with either approach. In both studies there was a trend towards reduced mortality in the rate control arms. Rhythm control was associated with an increased risk of adverse effects related to the use of antiarrhythmic drugs required to maintain sinus rhythm. These trials can help to guide management for individual patients with AF. Importantly, there will be patients in whom maintenance of sinus rhythm remains the preferred management strategy such as young patients with lone AF. Patients with a first episode of symptomatic AF, or AF with disabling symptoms should be considered for chemical or electrical cardioversion. Most patients will require an antiarrhythmic drug to maintain sinus rhythm in the long term (such as sotalol, flecainide or amiodarone; the particular agent being determined by individual patient characteristics and the relative toxicity of the chosen drug). Decisions regarding antiarrhythmic drug therapy should be made in conjunction with a cardiologist. Patients with asymptomatic AF, or AF that is well tolerated, can be managed with rate controlling medications such as diltiazem, beta-blockers and digoxin. Digoxin is particularly indicated in patients with heart failure, but is unlikely to provide adequate rate control in isolation.

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Cardioversion

If a rhythm control strategy is planned, cardioversion needs to be undertaken. If cardioversion is a certainty warfarin can be started at the time of referral as three to four weeks of adequate anticoagulation pre and post cardioversion is required (INR>2.0). If cardioversion is uncertain the patient should be referred for specialist evaluation. The likelihood of left atrial thrombus increases with increasing duration of AF. If the onset of AF is uncertain or AF has been present for more than 48 hours, elective cardioversion should be deferred until three to four weeks of therapeutic anticoagulation has been achieved.[4] Transoesophageal echocardiography (TOE) is sometimes used to expedite cardioversion[10] (if no atrial thrombus is detected with TOE immediate cardioversion is safe), however anticoagulation should be started at the time of TOE guided cardioversion and continued in the long term. Figure 2 provides a suggested management plan for patients who have developed AF.

Summary

Atrial fibrillation is a very common finding in elderly patients. It may be incidentally identified in an asymptomatic patient or be associated with disabling symptoms. AF may be a marker for underlying cardiovascular disease. Newly identified AF requires a formal diagnostic evaluation (including echocardiography). Treatment of patients should be individualised and issues of anticoagulation, rhythm control and rate control need to be considered for each patient.

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