ATRIAL FIBRILLATION IN GENERAL AND HOSPITAL PRACTICE

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General practice

Role of general practitioner

- To identify patients with new onset atrial fibrillation
- To assess thromboembolic risk and to start early treatment with antithrombotic drugs—warfarin will be needed for most patients, while aspirin may be suitable for patients aged <65 years with no cardiac risk factors or structural heart disease
- To help to monitor treatment with anticoagulants
- To refer appropriate patients to a cardiologist for further assessment (including echocardiography) and consideration of cardioversion
- To be aware of potential drug interactions and toxicity with antiarrhythmic drugs and anticoagulants

Despite the considerable interest in atrial fibrillation in epidemiological and hospital studies, little information exists on the prevalence and management of atrial fibrillation in general practice.

In a recent audit of a general practice list of about 10 000 patients, we found 67 patients who were currently in atrial fibrillation or who were known to have had past episodes of the arrhythmia.

A general practitioner typically has 10-15 patients with atrial fibrillation on his or her list

Prevalence of atrial fibrillation by age in a general practice population.

This prevalence increased with age, rising from 1.5% in people in their 60s to 8% in those aged over 90. A third of the 67 patients had paroxysmal atrial fibrillation. Only two thirds were currently receiving anticoagulant treatment, and an echocardiogram had been obtained in only a third. Of the 30 patients under 75 years, 10 had mitral valve disease, while only one patient aged over 75 had mitral valve disease.

From the stroke prevention in atrial fibrillation study, major clinical risk factors for stroke and thromboembolism were congestive heart failure, hypertension, and previous thromboembolism. We found that at least one of these risk factors was present in three quarters of patients seen in general practice with atrial fibrillation (and in 84% of those aged over 75).

The general population is aging—that is, the proportion of elderly people is increasing—and by the year 2000 the proportion of people over 70 in Britain will constitute 20-25% of the total population. Atrial fibrillation will therefore be an increasingly common cause of stroke, thromboembolism, and heart failure, emphasising that atrial fibrillation is an important public health problem. Many patients will also be taking antiarrhythmic drugs and anticoagulants.

When to refer patients with atrial fibrillation to a cardiologist

- Age <30
- Atrial fibrillation resistant to "usual" drugs for rate control
- Patient suitable for cardioversion
- Further assessment needed—for example, valvular heart disease
- Patient with moderate to severe heart failure
- Patient with resistant heart failure
- Frequent attacks of paroxysmal atrial fibrillation
- Syncopal attacks due to atrial fibrillation

As many elderly patients have other medical conditions, the problem of side effects and drug interactions will become increasingly common. For example, hypokalaemia secondary to the use of high doses of loop diuretics may result in dangerous arrhythmias in patients taking digoxin. The use of antiarrhythmics such as amiodarone may result in drug interactions with warfarin and digoxin with consequent toxicity.

Such possibilities emphasise the need for concurrent treatments to be fully recorded and for a high index of suspicion for drug interactions. Non-compliance by patients because of inadequate understanding or supervision may also be dangerous. Careful monitoring of requests for repeat prescriptions is therefore essential.

Drugs that may interact with oral anticoagulants

Gastrointestinal tract

Potentiating drugs—Antacids (magnesium salts); cimetidine; liquid paraffin and other laxatives

Antagonistic drugs—Cholestyramine; colestipol

Cardiovascular system

Potentiating drugs—Amiodarone; clofibrate; dextrothyroxine; diazoxide; dipyridamole; ethacrynic acid; quinidine; sulphinpyrazone

Antagonistic drugs—Cholestyramine; colestipol; spironolactone

Respiratory system

Antagonistic drugs—Antihistamines

Central nervous system

Potentiating drugs—Chloral hydrate and related compounds; chlorpromazine; dextropropoxyphene; dichloralphenazine (initial); diflunisal; mefenamic acid; monoamine oxidase inhibitors; triclofos sodium; tricyclic antidepressants

Antagonistic drugs—Barbiturates; carbamazepine; dichloralphenazine—late; haloperidol; phenytoin; primidone

Infections

Potentiating drugs—Aminoglycosides; ampicillin (oral); cephalosporins; chloramphenicol; co-trimoxazole; cyclosporine; erythromycin; isoniazid; ketoconazole; metronidazole; miconazole; nalidixic acid; penicillin G (large doses)—intravenous; quinine salts; streptotriad; sulphonamides (long acting); tetracycline

Antagonistic drugs—Grisofulvin; rifampicin

Endocrine system

Potentiating drugs—Anabolic steroids; chlorpropamide; corticosteroids; danazol; glucagon; metoclopramide; propylthiouracil; sulphonyl urea; thyroxine; tolbutamide

Antagonistic drugs—Oral contraceptives

Malignant disease and immunosuppression

Potentiating drugs—Cyclophosphamide; mercaptopurine; methotrexate; immunosuppressant drugs; tamoxifen

Musculoskeletal and joint disease

Potentiating drugs—Allopurinol; aspirin and the salicylates; azapropazone; diflunisal; fenclofenac; fenoprofen; feprazone; flufenamic acid; flubiprofen; indomethacin; ketoprofen; mefenamic acid; naproxen; paracetamol (high daily doses (with dextropropoxyphene distalgesc/coproxamol)); piroxicam; sulindac; sulphinpyrazone

Nutrition and blood

Potentiating drugs—Alcohol (dose dependent potentiator)

Antagonistic drugs—Vitamin K; alcohol

Ear, nose, and oesophagus

Antagonistic drugs—Antihistamines; phenazone

Skin

Antagonistic drugs—Antihistamines

Alcoholism

Potentiating drugs—Disulfiram (antabuse)

Who to screen for atrial fibrillation in general practice

Patients complaining of palpitations or syncope

Patients with stroke or transient ischaemic attacks

Patients with heart failure

Patients taking diuretics regularly or digoxin

The increasing prevalence of atrial fibrillation will result in more patients taking anticoagulant drugs. A high proportion of patients in general practice have risk factors for thromboembolism, which necessitate long term treatment with anticoagulants. This presents two problems: inconvenience and safety. Patients taking warfarin need regular monitoring of anticoagulation intensity and adjustment of dosage. Although this is often done at specialist anticoagulation clinics either in hospitals or in the community, this task is now increasingly being undertaken by some general practitioners. Many general practitioners, however, may be reluctant to take on this responsibility.

Increasing numbers of patients needing warfarin would cause considerable strain on the current provision of anticoagulation monitoring services, and new initiatives to provide anticoagulation in the community are urgently needed. Frail elderly people should not have to attend hospital clinics, which may be some distance from their homes. The safety considerations are related to the risk of haemorrhage and of drug interactions.

With the potentially increasing importance of atrial fibrillation as a cause of mortality or morbidity, the question arises of whether screening programmes would be cost effective? All general practitioners should at least have easy access to a reliable electrocardiogram machine to confirm atrial fibrillation; electrocardiography is easy to perform, although careful placement of the leads and interpretation is needed. Some difficulties, however, may arise in distinguishing atrial fibrillation from other supraventricular arrhythmias and in identifying pre-excitation syndromes.

Open access to general practitioners for echocardiography in local hospitals for patients with heart failure has been tried successfully in some centres, and there is a good case for extending this facility to the management of atrial fibrillation.

Standard positions for chest leads (top) and limb leads (bottom) for electrocardiography.

Atrial fibrillation in general practice—important considerations

Atrial fibrillation (continuous or intermittent) is an important cause of stroke in patients aged over 75

Most of these patients have other risk factors for strokes, including a history of hypertension, congestive heart failure, or previous thromboembolism

Echocardiography may be valuable in these patients

Unless contraindicated, treatment with anticoagulants or prophylactic aspirin should be started

Vigilance is necessary for side effects or drug interactions

The adequate treatment of atrial fibrillation, as of other chronic diseases, needs an effective channel of communication between hospital and general practice. Decisions on the advantages and disadvantages of treatment with anticoagulants need to be made jointly by the physician, the general practitioner, and the individual patient. A realistic assessment should be made of the burden placed on older patients by medical intervention. Some may prefer to be left alone, and this wish should be respected when possible, after discussion of the risks and benefits of treatment.

Hospital practice

Cost (£) of cardiological investigations in patients with atrial fibrillation

Electrocardiogram	£10-24
Trace with cardiomemo machine	£33
Trace with 24 hour Holter monitor	£60
Echocardiogram (two dimensional and M mode only)	£72
Echocardiogram (with Doppler)	£147
<i>Costs provided by cardiology department, City Hospital, Birmingham</i>	

As with general practice, the future increasing prevalence of atrial fibrillation will mean there will be more patients at increased risk of stroke and heart failure needing hospital care. In a Scottish hospital based study atrial fibrillation was present in 6.3% of emergency medical admissions. In our survey of admissions to a city centre district hospital in Birmingham covering a multiethnic population, atrial fibrillation was equally common in white, black (Afro-Caribbean), and Asian people. In both surveys this arrhythmia was associated with a pronounced morbidity and mortality from heart failure, stroke, and syncope.

Variation in treatment

- The quality of investigation and treatment of atrial fibrillation by non-specialist physicians varies
- A study in Britain of consultant physicians found that cardiologists did more detailed investigations than non-cardiologists
- Cardiologists were also more likely to use antiarrhythmic and antithrombotic treatment

Atrial fibrillation has important implications for the provision of investigations, such as echocardiography. Most cardiologists use this investigation for their patients with atrial fibrillation. In patients presenting with syncope, 24 hour Holter monitoring is advisable. Syncope is common in patients with atrial fibrillation, and the question therefore arises whether we can afford to investigate all patients with atrial fibrillation with so many detailed and expensive procedures.

Implications for more anticoagulation clinics

Warfarin tablets available in Britain.

Taking a blood sample in an anticoagulation clinic.

Patients taking warfarin as thromboprophylaxis need to attend anticoagulation clinics regularly so that the international normalised ratio can be monitored. Warfarin has potentially serious haemorrhagic side effects, particularly in elderly people, in whom peptic ulcers are common. Furthermore, many drugs have potentially serious drug interactions with warfarin. Cimetidine, for example, may inhibit the metabolism of warfarin, resulting in overanticoagulation. People taking warfarin would also need well designed literature, written in non-technical language, about what to do in the event of unusual symptoms or signs of bleeding. If such patients rely on ambulances this adds to the overall costs of treating such patients. Our hospital runs domiciliary anticoagulation checks, which minimise this expense.

Recent studies suggest that outpatient anticoagulation clinics may be less than satisfactory, with fewer than 50% of the results falling within the therapeutic range and nearly one third of patients being classed as "poorly controlled." This may be due to the high workload and inadequate time available to communicate with patients. Patients may also have to travel a long way to the nearest clinic and so may not keep all their appointments.

Booklet for recording anticoagulant treatment.

One solution may be more monitoring of anticoagulation treatment by general practitioners. A recent report suggests that the degree of anticoagulation control among patients in the care of general practitioners was better than that achieved by hospitals. If the benefits of anticoagulation treatment are to be extended to more patients with atrial fibrillation, particularly to older patients at higher risk, more attention will have to be given to the degree of control achieved. Only if this approaches that achieved in the large clinical trials will there be the substantial reduction of stroke reported in these trials.

The future

Key references

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The source of the data in the histogram is unpublished (J R Coope). The data in the box on drugs that react with oral anticoagulants are adapted from British Society of Haematology, *J Clin Pathol* 1990;**43**:177-83.

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The future management of patients with atrial fibrillation will need to address two important considerations. Firstly, new developments in thromboprophylaxis are needed so that patients with atrial fibrillation are inconvenienced as little as possible and receive prophylaxis with maximal efficacy in preventing strokes and thromboembolism. Large scale randomised studies exploring the use of very low intensity warfarin and aspirin and combinations of these are currently in progress.

Secondly, the ability to identify patients with atrial fibrillation who are at high risk of thromboembolic complications would be an important advance. Although clinical risk factors for stroke have been identified for patients with atrial fibrillation, transthoracic echocardiography may further refine risk stratification. Recently, transoesophageal echocardiography has been similarly used—for example, in the risk stratification of such patients before cardioversion. Patients with atrial fibrillation have also been found to have a hypercoagulable or prothrombotic state, with abnormalities of indices of thrombogenesis. Clearly, further study of ways to stratify the risks of patients with atrial fibrillation is needed.

WHEN I USE A WORD

Wine and roses

The drug and therapeutics committee was discussing gamolenic acid, and some of us were trying to figure out why Epogam, which contains 40 mg of gamolenic acid in evening primrose oil, was different from Efamast, which contains 40 mg of gamolenic acid in evening primrose oil. It turns out that they have different licensed indications: the former for eczema, the latter for mastalgia.

Now, just as the primrose (*Primula veris*) is not a proper rose, so the evening primrose (*Oenothera biennis*) is not a proper primrose. *Oenothera* comes (perhaps) from the Greek oinos (wine) and therā (a trap), because, as William Baird wrote in his 19th century dictionary, "The roots . . . are eatable, and were commonly taken after dinner to flavour wine." Others have said that it was a cure for a hangover (not, alas, a licensed indication). Oinos has given us many other words, including oenanthic, oenology, oenomania, oenomania, oenomel, and oenophile—after all of which we might need to resort to Oeno's Fruit Salts.

The word wine itself also comes from oinos, although it may not be immediately obvious why. Some letters of the early Greek alphabet had become obsolete by Attic times, including the digamma or vau, the sixth

letter of the alphabet, corresponding to the sixth letter of the Hebrew alphabet, vav. It sounded like a vee or ef, and it gave us our capital F, since it was formed from two capital gammas laid one on top of the other. Despite its later disappearance, however, traces of the digamma persisted. The Attic Greek word for a ship was naus, from which we get nautical; in Latin it was navis, which gives us navigate. The Greek word for a key was kleis, from which we get the musical instrument the ophicleide; in Latin it was clavis, which gives us the completely different instrument, the clavichord. So, in Greek we have oinos, but in Latin vinum, reflecting the missing digamma. Vinum gives us wine, vine, vinegar (sour wine), viniculture, vintage, and vinyl—the radical isomeric with ethenyl.

So, gamolenic acid seems to promise us Dowson's days of wine and roses—at least those of us with mastalgia. But the wine may be sour. *Oenothera* may have a different derivation altogether, from onothera, which means an ass trap. This is supported by the fact that the genus is called *Onagraceae*, from onagra, an ass. Perhaps this type of trap is intended for the etymologist who tries to work it out.—JEFF ARONSON, *clinical pharmacologist in Oxford*