

PRACTICE REVIEWED

Treatment of atrial fibrillation in a district general hospital

Gregory Y H Lip, Kim Nyen Tean, Francis G Dunn

Abstract

Objective—To assess current strategies used to investigate and manage acute atrial fibrillation in hospital.

Design—Prospective survey of all acute admissions over 6 months.

Setting—District general hospital serving a population of 230 000 in north east Glasgow.

Subjects—2686 patients admitted as emergency cases over 6 months.

Results—Of the 2686 patients, 170 (age range 38–95, mean (SD) 73.5 (10.6) years; 70 men (41%) and 100 women (59%)) were admitted with atrial fibrillation.

The principal underlying medical conditions were ischaemic heart disease in 79 (46.5%), rheumatic heart disease in 26 (15.3%), and thyroid disease in six (3.5%). Cardiac failure was present on admission in 61 (36%), cerebrovascular events in 23 (14%), and myocardial infarction in 17 (10%). Of those with a history of atrial fibrillation (102 (60%) including 10 with paroxysmal atrial fibrillation) treatment on admission included digoxin in 71 (70%), warfarin in 20 (20%), and aspirin in 17 (17%); the aspirin was predominantly given for concomitant vascular disease. The mean (SD) inpatient stay was 16 days (19.7) (range 1–154) largely due to the patients with stroke. Thyroid function tests were performed in only 63% and echocardiography in 33%. Overall, the rate of introduction of anticoagulation (seven patients) and attempted cardioversion (21 patients: 19 pharmacological and two electrical) was surprisingly low. Only 49 patients (34% of those not on warfarin) had contraindications to anticoagulation: these included peptic ulcer or gastrointestinal bleeding in 18 (12%), dementia in eight (6%), chronic renal failure or dialysis in eight (6%), and alcohol excess in four (3%).

Conclusion—Standard investigations were inadequately used in patients with atrial fibrillation and there was a reluctance to perform cardioversion or to start anti-coagulant treatment.

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Atrial fibrillation is one of the most common cardiac arrhythmias among acute medical

admissions to district general hospitals but there seems to be a wide range of views on its optimal management. This is not surprising as the management of the patient with atrial fibrillation is complicated by such things as diverse therapeutic options, concerns about anticoagulation, and the proarrhythmic effects of antiarrhythmic treatment. We report an audit relating to the investigation and management of patients admitted as emergencies with this dysrhythmia to a district general hospital, for a six month period between 1 September 1991 and 29 February 1992.

Methods

The hospital is a 990 bed district general hospital serving a population of 230 000 in the north east part of the city of Glasgow and the borough of Strathkelvin. The hospital has a coronary care unit with six medical wards, a renal ward and a large geriatric department. There are nine general physicians, one of whom has a major interest in cardiology. Also there is a full time cardiologist, two renal physicians and four physicians with an interest in geriatric medicine, none of whom undertake general medical receiving duties. The physicians were informed at the start of the study that an audit was going to take place as this is part of hospital protocol. Thereafter, the information was collected from the case records and no further discussions were held with the physicians involved.

Patients were prospectively included in this study if they were found to be in established atrial fibrillation on the admission electrocardiogram, or had developed atrial fibrillation within 48 hours of admission. Patients were studied from the three medical units within the hospital, the coronary care unit the renal unit, and the geriatric wards.

The mode of presentation, cardiac investigations carried out, the aetiology of atrial fibrillation, the treatment before and that initiated after admission, and the inpatient mortality were also noted. The survey therefore assessed the characteristics of the inpatients admitted with atrial fibrillation, duration of stay, whether the aetiology of atrial fibrillation was assessed, what investigations were undertaken, and what their impact on management was and also actual management undertaken on the patient. This was done at the time of admission, during their stay in hospital, and at the time of discharge.

Department of
Cardiology, Stobhill
General Hospital,
Glasgow G21 3UW
G Y H Lip
K N Tean
F G Dunn

Correspondence to:
Dr Gregory Y H Lip,
University Department of
Medicine, Dudley Road
Hospital, Birmingham
B18 7QH.

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Table 1 Demographic data

Acute medical admissions (6 months)	2686
Admissions with atrial fibrillation	170 (6.3%)
Sex ratio (men:women)	70:100
Age (mean (SD))	73.5 (10.6)

Results

During the six months of the study the total number of emergency admissions to the medical and geriatric services was 2686, an average of 448 patients/month (table 1). Over this period, 170 patients (6.3%) were found to have atrial fibrillation (an average of 28 patients/month) of these, 100 (59%) were women. Their mean (SD, range) age was 73.5 (10.6, 38–95) years. One hundred and two (60%) patients had a history of atrial fibrillation (including 10 (3.5%) who had had paroxysmal atrial fibrillation), and 68 (40%) were newly diagnosed patients, with no previous record of the dysrhythmia.

MEDICAL HISTORY AND LIKELY UNDERLYING AETIOLOGY OF ATRIAL FIBRILLATION

Table 2 shows the underlying medical conditions in patients with atrial fibrillation. The principal conditions were ischaemic heart disease in 79 (46.5%), hypertension in 30 (17.6%), rheumatic heart disease (predominantly mitral valve disease) in 26 (15.3%), and thyroid disease in six (3.5%). Also, 38 patients (22.4%) had a history of cerebrovascular disease, either a stroke or transient ischaemic attack.

SYMPTOMS AND PRESENTING FEATURES ON ADMISSION

The commonest presenting symptoms were typically cardiac (table 3). The principal symptoms were breathlessness in 88 (51.8%), chest pain in 58 (34.1%), palpitation in 44 (25.9%), and dizziness or syncope in 32 (18.8%).

The predominant presenting clinical features included heart failure in 61 (35.9%), a cerebrovascular event in 23 (13.5%), myocardial infarction in 17 (10%), angina in 14 (8.2%), chest infection in 12 (7.1%), and digitoxicity in three (1.8%).

INVESTIGATIONS

All patients had an electrocardiogram and chest x ray film on admission. Recording of

clinical data was variable, and complete information on investigations undertaken was only available for 146 patients (86% of 170). Echocardiography was performed in 48 patients (33%). Cardiac enzymes and thyroid function tests were performed in 92 (63%). A treadmill exercise test was performed in five patients (3.4%), and 24 hour Holter monitoring was performed in eight patients (5.5%).

In the 170 patients with atrial fibrillation, a new myocardial infarction was identified on the electrocardiogram in 12 patients (7.1%), and an old infarction was present in 15 patients (8.8%). The commonest was an inferior myocardial infarction, present in 17 (63% of the 27 patients with an infarct on the electrocardiogram). Cardiac ischaemic changes were found in 29 patients (17% of all admissions).

Chest x rays films showed cardiomegaly in 93 patients (54.7%) of those admitted in atrial fibrillation. Pulmonary congestion was present in 77 patients (45.3%). Of the 48 patients in whom echocardiography was performed, findings included large left atria in 31 (64.6% of 48), mitral valve disease in 39 (81.3%), poor left ventricular function in 30 (62.5%), and left ventricular hypertrophy in 11 (22.9%).

TREATMENT BEFORE ADMISSION

In those patients with a history of atrial fibrillation (102, including 10 with paroxysmal atrial fibrillation) the commonest treatment before admission was digoxin in 71 (70%). A diuretic was given in 89 (52.4%), and a β blocker was used in 16 (9.5%). Out of these 102 patients, antithrombotic treatment was used in only 37 patients, with 20 (20%) given warfarin treatment and 17 (17%) aspirin. Among the 17 patients on aspirin, 11 patients were taking aspirin for concomitant vascular disease rather than prophylaxis against thromboembolism.

TREATMENT INITIATED AFTER ADMISSION

In the 68 patients (40% of 170) without a history of atrial fibrillation, digoxin was used in 51 (75%) and amiodarone in 23 (34%). Additional treatment started in the group as a whole included a β blocker in six patients (3.5% for rate control in atrial fibrillation and treatment of associated angina) and diuretics, with intravenous diuretic required on admission in 52 patients (30.6%) and subsequent maintenance oral diuretic required in 46 patients (27%). Antithrombotic treatment was started in 27 patients. Seven patients (5% of the 150 not previously on warfarin) were given warfarin, and 20 (15% of the 138 not previously on aspirin) were started on aspirin treatment. Of these 20 patients only five were given aspirin as prophylaxis against embolic events; the rest (15 patients) were given aspirin for concomitant vascular disease. Contraindications to anticoagulation were only identified in 49 patients (34% of those not on warfarin); and these included peptic ulcer or gastrointestinal bleeding in 18 (12%), dementia in eight (6%), chronic renal

Table 2 Underlying medical conditions

	Number(%) (total n = 170)
Ischaemic heart disease	79 (46.5)
Hypertension	30 (17.6)
Rheumatic heart disease	26 (15.3)
Thyroid disease	6 (3.5)

Table 3 Symptoms and presenting features on admission

	Number(%) (total n = 170)
Symptoms:	
Dyspnoea	88 (51.8)
Chest pain	58 (34.1)
Palpitation	44 (25.9)
Dizziness or syncope	32 (18.8)
Presenting features:	
Heart failure	61 (35.9)
Cerebrovascular event	23 (13.5)
Myocardial infarction	17 (10)
Angina	14 (8.2)
Chest infection	12 (7.1)
Digitoxicity	3 (1.8)

failure or dialysis in eight (6%), Crohn's disease in one (0.6%), alcohol excess in four (3%), and other major illness in 10 (7%).

Cardioversion was attempted in 21 cases (12.4% of all admissions). Pharmacological cardioversion was the commonest method, used in 19 patients (11.2%), particularly in the coronary care unit. Of these, 18 patients were given amiodarone, but one patient cardioverted after intravenous digoxin. Two patients did not cardiovert. The remaining two patients (1.2%) underwent direct current cardioversion.

DURATION OF STAY AND INPATIENT MORTALITY

Complete information on duration of stay was available for 146 patients (86% of 170). The mean (SEM, range) inpatient stay was 16 (1.63, 1–154) days, largely due to patients with stroke. There was a weak but significant correlation between age and duration of stay (Spearman $r = 0.22$; $p < 0.01$).

There were a total of 26 (15.3%) inpatient deaths among our patients. The predominant causes of death were ischaemic heart disease and heart failure. No post mortem examinations were undertaken.

Discussion

The main reasons for treating atrial fibrillation are the prophylaxis of thromboembolic events and control of the ventricular rate. Treatment of atrial fibrillation also improves overall cardiac function and exercise tolerance in these patients. There is, however often wide variation in the management of this arrhythmia among physicians, both in the choice of investigations and on specific aspects of treatment—for example, in the initiation of anticoagulation.¹

Standard investigations in a patient with atrial fibrillation should include an assessment of history, clinical state, and possible precipitating factors (alcohol, infection, and others), thyroid state by thyroid function tests, and an assessment of cardiac state by an electrocardiogram, chest x ray film, and echocardiography: Echocardiography will provide useful information on cardiac function and structural heart disease in these patients. Also, measurement of cardiac enzymes (in an acute presentation) and 24 hour Holter monitoring may also be required.

Our study shows a suboptimal application of these standard investigations in the management of patients with atrial fibrillation. For example, echocardiography was only performed in 33% of patients. Interestingly, of these patients, 65% had dilated left atria, 81% had mitral valve disease, and 63% had poor left ventricular function, indicating that useful information was obtained from this investigation. Also, 24 hour Holter monitoring was performed in only 5.5% of patients, though 18.8% had a history of dizziness or syncope. This has important implications as ventricular standstill may commonly occur in patients with controlled atrial fibrillation who

complain of dizziness or syncope, and most of these patients will benefit from permanent cardiac pacing.² Another mandatory investigation, thyroid function tests, was performed in only 63%. This also has important implications as atrial fibrillation commonly complicates hyperthyroidism, and clinically occult thyrotoxicosis may be the cause of idiopathic atrial fibrillation in an important proportion of cases.³

Though the commonest underlying pathology in our patients was ischaemic heart disease, ischaemic changes not associated with infarction were seen on the electrocardiogram in only 17% of patients, whereas changes due to infarction were present in 16% (the commonest was an inferior myocardial infarction). It has been previously noted, however, that when atrial fibrillation is associated with myocardial infarction it is important as an indicator of underlying ventricular dysfunction and a compromised myocardium, although there was no independent effect on mortality.⁴

The frequency with which heart failure accompanies atrial fibrillation is shown by our study. For example 52% of our patients presented with dyspnoea, 45% of patients had pulmonary congestion evident on the chest x ray film, 63% of patients had poor left ventricular function on the echocardiogram, and intravenous diuretic was required acutely on admission in 31% of patients (with subsequent maintenance oral diuretic required in 27%). Clinical heart failure was present in 36% of our patients. A similar proportion (37.5%) of patients with atrial fibrillation was shown in a study of admissions with heart failure to a district general hospital.⁵ The presence of atrial fibrillation, however, may be an indicator for an increased risk of death, especially in patients with heart failure and lower filling pressures secondary to vasodilator or diuretic treatment.⁶

Recent large scale randomised studies have established the importance of anticoagulation treatment in the prophylaxis against thromboembolic events in patients with chronic atrial fibrillation.^{7–12} When our study was performed only three of the five large scale studies had been published, but it was evident then that warfarin treatment reduced the risks of stroke by two thirds in patients with chronic atrial fibrillation.^{7–10} Consensus about initiating oral anticoagulation treatment, however, continues to be lacking among general physicians as the rate of anticoagulation in our study was surprisingly low, with only 5% of patients having warfarin added to their treatment. The main concerns about starting warfarin seem to be the inconvenience and safety.¹³ Age, however, should not be a contraindication to initiating oral anticoagulation.¹⁰ The main reason for variation by physicians in initiation of such treatment seems to be the perceived differences in the estimated risk of systemic embolism in individual patients.¹ Aspirin is thought to be an alternative and was started in 20 patients in this study (although in most this was for

concomitant vascular disease rather than prophylaxis against thromboembolism), but in fact, only two of the five trials of warfarin in atrial fibrillation have reported a reduction (by about 25%) of thromboembolic risk with aspirin.^{7,8,13} The use of aspirin alone, therefore, as an effective antithrombotic agent in atrial fibrillation remains controversial.¹³

The haemodynamic disturbance of atrial fibrillation results essentially from the absence of atrial systole and from the rapidity and irregularity of the ventricular response. With increasing age or heart failure, atrial systole contributes an increasing amount towards overall stroke volume. Indeed there is a significantly improved cardiac output and exercise capacity after cardioversion of atrial fibrillation to sinus rhythm.¹⁴ In our study, there was a low rate of attempted cardioversion (12% of patients), with pharmacological cardioversion the commonest method. For a patient whose rhythm is atrial fibrillation, the most complete relief of symptoms often occurs when sinus rhythm is restored. Cardioversion should therefore have been attempted in most patients who present with atrial fibrillation of recent onset. The procedure is generally most successful in younger patients with no underlying cardiac disorder and has the added advantage that warfarin can be withdrawn after two to four weeks if sinus rhythm is maintained.¹⁵

This study establishes the importance of atrial fibrillation as a presenting dysrhythmia amongst emergency medical admissions in a Scottish district general hospital. As complete information on duration of stay and investigations undertaken was available in only 86% of our patients, our study also highlights some of the problems that occur in producing accurate figures for admissions. Our study provides useful information about a common condition and is particularly important at this time when medical audits are playing a larger part in planning the allocation of resources. For example, the mean inpatient stay in our study was 16 days, but with a wide range of 1–154 days. This finding and the significant correlation between age of patient and duration of inpatient stay has important implications as the general population becomes more elderly (with a greater life expectancy) and as the prevalence of atrial fibrillation increases with age from 0.5% at 50–59 to 8.8% at 80–89.^{16–18}

In conclusion, atrial fibrillation is a common finding among emergency medical admissions to a district general hospital.

Heart failure is the commonest presenting clinical feature, and ischaemic heart disease is the most frequent underlying cause. There is also a suboptimal application of standard investigations in patients with atrial fibrillation, and a reluctance to start oral anticoagulation treatment or to consider cardioversion, both of which are playing an increasingly prominent part in the management of this group of patients. These issues need to be considered to allow better management of this common arrhythmia.

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