EVIDENCE CENTRE REPORT

Is there an evidence-based approach to the management of Paroxysmal Atrial Fibrillation?

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SUMMARY STATEMENT:

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REQUEST:

Is there an evidence-based approach to the management of Paroxysmal Atrial Fibrillation?

REQUESTED BY:

Ms Mary Buchanan, Director of Emergency Services, Dandenong Hospital.

SUMMARY OF FINDINGS:

After an exhaustive search scanning a wide variety of databases and a large number of websites and medical societies, only one report was found that explored the current knowledge and recommendations for the management of atrial fibrillation.

The report commissioned on behalf of the Working Group on Arrhythmias of the European Society of Cardiology was undertaken in order to increase the awareness of the commonly encountered arrhythmia that may produce disabling symptoms, haemodynamic impairment, and a decrease in life expectancy.

The report clearly states that its purpose is to briefly outline the state of our knowledge on the clinical presentation, the causes, the mechanisms and therapeutic approaches currently available and to promote recommendations for management.

Despite the efforts to obtain a consensus as large as possible among experts, this report reflects the opinion of the authors and does not necessarily reflect the official opinion of the European Society of Cardiology.

METHODOLOGY

Search Strategy

The Centre for Clinical Effectiveness defines the 'best available evidence' as that research we can identify that is least susceptible to bias. We determine this according to pre-defined NHMRC criteria (see Appendix).

First we search for systematic reviews, evidence-based clinical practice guidelines or health technology assessments, and randomised controlled trials. If we identify sound, relevant, material of this type the search stops. Otherwise, our search strategy broadens to include studies that are more prone to bias, less generalisable, or have other methodological difficulties. We include case-control and longitudinal cohort studies in our critical appraisal reports. While we cite observational and case series studies, and narrative reviews and consensus statements, in our reports we do not critically appraise them. Such studies can produce accurate results but they are generally too prone to bias to allow determination of their validity beyond their immediate setting.

Details Of Evidence Request

Patients: 20+ years with paroxysmal atrial fibrillation
Interventions: electrical and pharmacological cardioversion
Comparisons: electrical verses pharmacological cardioversion
Outcomes: sinus rhythm

Search terms

Arrhythmia terms: PAF; paroxysmal atrial fibrillation; atrial fibrillation; AF; arrhythmia; management; treatment; therapy; anti-arrhythmic; anti-coagulation.

Resources Searched

We searched the following databases:

Agency for Health Care Policy and Research
American Society of Anaesthesiologu
Best Evidence CD-ROM
BioMed Net
Cardionet
Chest
CINAHL
Cochrane Library CD-ROM
Critical Care Forum
Critical Care Medicine Homepage
Current Opinion in Critical Care
Fast
Health A to Z
Health on the Net
HealthWeb
Invivo – Anaesthesia, Critical Care, Emergencies
Medical Matrix
Medical Smart Search

National Guideline Clearinghouse
Omni
OVID Medline
SavvySearch
Society for Critical Care Medicine

Refinements, Searching & Reporting Constraints

We have included only English language articles published since 1995 Our electronic searching was performed during the week beginning 1st November 1999.

RESULTS:

From our sources we identified 1 article which we categorised as follows:

Systematic reviews or meta-analyses	0
Evidence-based clinical practice guidelines	0
Randomised controlled trials	0
Controlled trials, cohort or case-control analytic studies	0
Descriptive case series	0
Consensus reports, non-evidence-based clinical practice guidelines	**1**
Narrative reviews	0
(add if appropriate) Economic studies	0

We are reasonably confident that this article represents the most important findings published to date based on our refinements, searching and reporting constraints.

EVIDENCE SUMMARIES

Format

The report follows the Appraisal Instrument for Clinical Guidelines suggested by Cluzeau et al (1998). The guidelines are divided into three dimensions: rigour of development, context and content and appplication.

Findings

The report proffers the following recommendations:

Conversion of AF to SR:

Pharmacological cardioversion

Pharmacological cardioversion of recent onset atrial fibrillation requires a careful consideration of the clinical setting and knowledge of the antiarrhythmic drugs to be used.

In a hospital setting, it is recommended to start heparin therapy immediately upon admission of a patient with onset AF, since the duration of the arrhythmia cannot be predicted.

For restoration of SR, class IC drugs administered either orally or intravenously seem efficient and safe in patients without underlying heart disease. In patients with ischemic

heart disease, low LVEF, heart failure, or major conduction disturbance, Class IC drugs should be avoided for restoring SR.

Class III antiarrhythmics such as Sotalol and Amiodarone are to be used with AF and AMI or with left ventricular dysfunction in whom class IC drugs are contraindicated. Favourable outcomes – with efficacy rates ranging from 25 to 83 per cent - are achieved with Amiodarone over other class III antiarrhythmics. However, its use should be limited due to its potentially severe adverse reactions.

Utilization of cardiac glycosides such as Digoxin demonstrates that it is no better than a placebo. Digoxin is found to be effective in restoring SR in patients with congestive heart failure by improving the haemodynamic status through its positive inotropic effect.

Calcium antagonists such as Verapamil and Dilitiazem and beta blockers such as Atenolol, Esmolol, and Metoprolol have been used in AF following cardiac surgery but their role remains to be defined in this setting.

Electrical cardioversion

Electrical cardioversion may be indicated in patients with an episode of persistent AF associated with haemodynamic deterioration, either after failure of pharmacological cardioversion or as first line therapy.

Electrical cardioversion is the technique of choice provided there is no temporary contraindication such as digitalis toxicity, hypokalemia, acute infectious or inflammatory diseases or non-compensated heart failure.

Anticoagulation is recommended 3 weeks before cardioversion in patients with AF of 48 hours or more duration and for a minimum of 4 weeks afterwards. There is little good evidence for this specific recommendation, however, the risk of an embolic event ranges from 1 to 5.3 percent in non anti-coagulated patients. As general anaesthesia is required for external cardioversion, contra-indications to general anaesthesia should be ruled out.

Laboratory tests such as thyroid function test, serum creatinine and serum potassium are required before elective electrical cardioversion.

If repeated electrical cardioversion is required, the prophylactic use of antiarrhythmic therapy such as sodium or potassium channel blockers should be considered.

Rate control during AF

Rate control may be indicated in patients who have been unsuccessful in the conversion to SR with antiarrhythmic therapy. The control of heart rate is to be achieved with other pharmacological interventions or with atrioventricular node modification or ablation using radiofrequency current.

Cardiac glycosides such as Digoxin is generally considered to be effective for rate control in AF particularly when congestive heart failure is present. This has not been proven for other AF patients. A controlled study has not found Digoxin to be effective in the prevention of recurrences of AF.

Non-dihydropyridine calcium antagonists or Class IV antiarrhythmics such as Verapamil and Dilitiazem are the most commonly used drugs used in the emergency setting. It has been suggested that calcium antagonists might prolong paroxysms, making chronic use in PAF less desirable. However, this contrasts with other investigational data which shows

that electrical remodeling is prevented by calcium channel blockers, making its use for rate control acceptable.

Beta-blockers are also used to control heart rate in AF. Intravenous beta-blockade with cardio-selective agents such as Atenolol and Metoprolol can be of value in specific settings. Caution should be taken with those patients in heart failure.

Proposed Management Strategy of Paroxysmal Atrial Fibrillation(PAF)

The European Society of Cardiology proffer the following strategy for the management of PAF:

No or minimal heart disease

The first therapeutic intervention should be either a beta-blocker or a class 1C antiarrhythmic drug.

They warn that beta-blockers are relatively ineffective in these circumstances but have the advantage of being well tolerated. Of the antiarrhythmics, they report that class 1C have the highest reported success rate of preventing PAF.

In the event that they fail and beta-blockers have proved not useful, the class III agent, Amiodarone, should be the next approach. When this drug fails or is inappropriate, then non-pharmacological strategies such as ablation with rate control, alternative drugs or pacing should be considered.

Presence of heart disease

When PAF produces symptoms that require treatment and there is significant heart disease, management is much more difficult. Class 1C antiarrhythmic drugs are not recommended due to their pro-arrhythmia actions.

For a few patients, beta-blockers may be worth a trial, particularly with the reports of the benefits of cautious, selective use of low dose beta-blockade in patients with heart failure. For many individuals, however, the class III agent Amiodarone will be the drug of choice.

In all categories, there is a risk of thromboembolism. The antiarrhythmic strategy must be allied with consideration of the thromboembolic risk. In situations of moderate to high risk, oral Warfarin is appropriate. In very low risk circumstances, Aspirin may be the appropriate alternative.

Please refer to the algorithm as suggested by the European Society of Cardiology.

REFERENCES

Cluzeau, F; Littlejohns, P; Grimshaw, J; and Feeder, G. Appraisal instrument for clinical guidelines. St.George's Hospital medical School, London, May, 1997.

ARTICLES CRITICALLY APPRAISED FOR THIS REPORT

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APPENDIX

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Levels Of Evidence

As Defined By "A Guide To The Development, Implementation And Evaluation Of Clinical Practice Guidelines" (National Health & Medical Research Council, Canberra, 1998):

Level I

Evidence obtained from a systematic review or meta-analysis of all relevant randomised controlled trials.

Level II

Evidence obtained from at least one properly designed randomised controlled trials.

Level III

1) Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method).

2) Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case control studies or interrupted time series with a control group.

3)Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group.

Level IV

Evidence obtained from case series (either post-test or pre-test and post-test), opinions of respected authorities (narrative reviews), descriptive studies, reports of expert (i.e. consensus) committees, case studies.