

This Just In...

An Update on Arrhythmia

What do recent studies reveal about arrhythmia? In this article, the authors provide an update on atrial fibrillation and ventricular arrhythmia.

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As presented at the University of Toronto's "Saturday at the University" (October 2003)

Atrial fibrillation (AF) is a disorder seen across all age groups, but which is increasingly prevalent among the elderly. With an increasing elderly population, we will see an epidemic of this common arrhythmia. Reversible causes of AF include:

- cardiac surgery,
- hyperthyroidism,
- pulmonary disease,
- pulmonary embolism,
- acute alcohol intoxication,
- non-cardiac surgery, and
- myocarditis.

The principal complication of long-term AF is embolic stroke from left atrial thrombus that may form as blood flow in the atrium slows and stagnates.

What do studies show?

Recently, the thinking regarding our approach to AF has changed. It was previously thought to be best to attempt restoration of sinus rhythm whenever possible. If this strategy failed, ventricular rate control and systemic anticoagulation were employed to reduce the risk of stroke. However,

Mrs. Pablo

Mrs. Pablo, 68, presents to your office with a complaint of occasional palpitations for the last three months. Her past medical history is remarkable for hypertension (treated with diuretics) and quiescent, ulcerative colitis.



Her physical examination reveals an irregular heart rate of 128 beats per minute (bpm) and blood pressure of 142/74 mmHg. Her exam is otherwise unremarkable. An electrocardiogram performed the same day shows atrial fibrillation, with a ventricular response of approximately 130 bpm.

How should you manage Mrs. Pablo?

investigators have conducted a landmark study, the Atrial Fibrillation Followup Investigation of Rhythm Management (AFFIRM) trial, to examine the merits of these two approaches.

A strategy of rate control is simple and the titration to a therapeutic, rate-limiting dose is usually easy. This approach does not attempt to restore regular atrial contractility and, as

Table 1

Recommendations for antithrombotic therapy in patients with AF

Patient features	Antithrombotic therapy
< 60 years with no heart disease	ASA, 325 mg OD, or no therapy
< 60 years with heart disease, but no stroke risk factors	ASA, 325 mg OD
> 60 years with no stroke risk factors	ASA, 325 mg OD
≥ 60 years with diabetes or CAD	Oral anticoagulation
≥ 65 years with stroke risk factors	Oral anticoagulation
≥ 75 years, especially women	Oral anticoagulation
Heart failure, EF ≤ 35%, thyrotoxicosis, HT	Oral anticoagulation

AF: Atrial fibrillation
 ASA: Acetylsalicylic acid
 OD: Once daily
 CAD: Coronary artery disease
 EF: Ejection fraction
 HT: Hypertension

such, necessitates anticoagulation to reduce the risk of embolic stroke. The strategy of sinus rhythm maintenance using an antiarrhythmic drug has the supposed advantage of restoring normal physiology and hemodynamic function. The major drawback of this tactic is that many of the drugs used (particularly amiodarone) are also proarrhythmic and associated with potential deleterious side-effects with long-term administration.

The AFFIRM results demonstrated the superiority of the rate control and anticoagulation

approach over the use of antiarrhythmics in preventing ischemic stroke in AF patients who were not severely symptomatic. A likely explanation for this finding is that patients go in and out of AF and are at increased risk of stroke, even with antiarrhythmic drugs.

The need for anticoagulation in AF patients has been reinforced with the AFFIRM trial. Unless the patient is young, and without structural heart disease, anticoagulation is warranted (Table 1).

What's on the horizon for AF?

Oral anticoagulation with warfarin and monitoring is cumbersome; however, there are several new alternatives for systemic anticoagulation being investigated.

The recently completed Stroke Prevention by Oral Thrombin Inhibitor in atrial Fibrillation (SPORTIF) V study demonstrated the non-inferiority of the oral, direct-thrombin inhibitor, ximelagatran, relative to warfarin in preventing stroke or sys-

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Mr. Neruda

Mr. Neruda, 59, has a history of hypertension, dyslipidemia, and smoking. He was recently admitted to the hospital after suffering an anterior myocardial infarction. He underwent diagnostic angiography and was found to have 100%



stenosis of the mid-left anterior descending artery. Subsequent myocardial perfusion imaging demonstrated a non-reversible deficit of the anterior wall and apex, with an ejection fraction of 22%.

He presents to your office three weeks after discharge. He is asymptomatic and wants to return to work. He wants to know about his treatment options, specifically the defibrillators he has read about in the newspaper.

Is Mr. Neruda a candidate for an implantable defibrillator?

temic embolic event in patients with non-valvular AF and at least one other risk factor. Ximelagatran has not yet been approved for routine use and warrants further investigation.

Another study, the Atrial fibrillation Clopidogrel Trial with Irbersartan for the prevention of Vascular Events (ACTIVE) trial, will examine the combination of clopidogrel and acetylsalicylic acid versus warfarin for the prevention of stroke.

What about VA?

Patients with reduced left ventricular (LV) function after a myocardial infarction (MI) are a population at risk for life-threatening ventricular arrhythmias

Table 2

Patients who should be considered for an AICD in CHF

- Resuscitated sudden arrhythmic deaths
- Documented symptoms associated with VT/VF and positive electrophysiology study
- Patients with ischemic and non-ischemic heart failure who are optimized on state-of-the-art medical therapy, documented persistence of LVEF \leq 30%, and otherwise reasonable quality of life and survival expectancy

AICD: Automatic implantable cardiac defibrillator
CHF: Congestive heart failure
VT: Ventricular tachycardia
VF: Ventricular fibrillation
LVEF: Left-ventricular ejection fraction

(VAs) and sudden death. Areas of scarred myocardium serve as a focus for these malignant arrhythmias. In patients who survive sudden death, automatic implantable cardiac defibrillators (AICDs) are the standard of care. It should be noted that not all congestive heart failure patients need AICDs.

Several trials have recently helped answer the question of who may benefit from the use of prophylactic implantable devices for the treatment of VAs in patients with coronary heart disease and LV dysfunction.

The Second Multicentre Automatic Defibrillator Implantation Trial (MADIT II) examined the question of whether the prophylactic implantation of a defibrillator for patients with MI and reduced ejection fraction (EF) could improve survival. Patients included in the study had suffered an MI more than 30 days prior to the study and had an EF $<$ 30%. Patients did not need an electrophysiologic study prior to entry. The findings of the MADIT II were positive, supporting a

Take-home message

- The AFFIRM trial results demonstrate the superiority of the rate control and anticoagulation approach over the use of antiarrhythmics in preventing ischemic stroke in patients who are not symptomatic with AF.
- In patients who survive sudden death, AICDs are the standard of care.
- GPs should consider referring post-MI patients with LV dysfunction to an appropriate referral centre or cardiologist regarding AICD implantation.

survival benefit for those randomized to AICDs, especially in the group of patients with very low EF ($<$ 20%). Currently, many patients with LV dysfunction and coronary disease may benefit from AICDs if they are otherwise well (Table 2).

General practitioners should consider referring patients with LV dysfunction after MI to an appropriate referral centre or cardiologist for discussion regarding AICD implantation.

Does AICD insertion avert the need for antiarrhythmic medications?

Many patients will never require any antiarrhythmic drugs. However, if, for example, a post-MI patient experiences a VA causing symptoms or resulting in delivery of an electrical discharge by the AICD, antiarrhythmic medications are often used to decrease the frequency of such episodes; AICDs can cause discomfort when they deliver an electrical discharge. Patients may also experience anxiety in anticipation of delivery of electrical discharge if they have previously experienced it.

Frequently Asked Questions

1. Should I not try to restore sinus rhythm in all patients with AF?

No. There will be patients in your practice, including those with concomitant valvular disease, who will benefit from restoration of sinus rhythm, especially if they are symptomatic.

2. Do all patients require anticoagulation?

The results of the AFFIRM trial would suggest so, given our limited ability to effectively maintain sinus rhythm, especially in those patients with risk factors for stroke.

3. What medications can be used for rate control?


For many patients, AV nodal blocking agents such as beta blockers and many calcium-channel blockers will prove useful. In the sedentary, older patient, digoxin may be added.

4. What about interventional electrophysiology procedures for the ablation of AF?

These procedures are still being evaluated and, while being used more frequently, are currently indicated in a very small number of patients who have generally failed conventional medical therapy and who are symptomatic with their AF.

5. After a heart attack, should all patients with poor EF be considered for an AICD?

These devices should be considered for most patients. Other factors, such as comorbid illness (that is likely to significantly impact on quality of life) and patient preference, will sometimes lead to a decision not to proceed with AICD implantation.

Therefore, efforts to suppress these events (though the therapy itself is life-saving) with medications is often quite welcome. 

Suggested Readings

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3. Reiffel JA: Will direct thrombin inhibitors replace warfarin for preventing embolic events in atrial fibrillation? *Curr Opin Cardiol* 2004; 19(1):58-63.
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