

Rhythm Control Versus Rate Control for Atrial Fibrillation and Heart Failure

NEJM, 2008; 358: 2667-2676

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Background

- Atrial fibrillation (Afib) is present in 10-50% of patients with heart failure.
- Adverse effects of Afib may have in heart failure include: rapid vs slow heart rate, irregular rhythm, loss of “atrial kick” for optimal ventricular filling, activation of neurohumoral vasoconstrictors.
- Patients with heart failure and in AFib often have their rhythm restored to sinus with the thought that the suppression of Afib may improve patient outcome.
- Prior studies do not support routine strategy of rhythm control with patients with AFib (ex. AFFIRM trial). However only a small numbers of the patients were with decreased LV function.

Hypothesis

Rhythm control strategy would reduce the rate of death from cardiovascular causes, versus a rate control strategy, among patients with Afib with CHF.

Study Design

Study type: multicenter, prospective, randomized trial

Setting: 123 hospitals in Canada, United States, Brazil, Argentina, Europe and Israel

Time period:

Recruitment period 5/2001-6/2005

Follow up period ended on June 30, 2007

Inclusion Criteria:

1. LVEF of 35% or less –measured by nuclear imaging, echo or cardiac angiography performed 6 months or less before enrollment
2. Hx of CHF –defined as symptomatic NYHA class II or IV within previous 6 months, or asymptomatic but had been admitted for heart failure in the previous 6 months/or LVEF of 25% or less
3. Hx of Afib with EKG documentation
 - an episode lasting at least 6 hrs or requiring cardioversion with past 6 months, or
 - an episode lasting for at least 10 minutes within the previous 6 months AND previous electrical cardioversion for Afib

Exclusion Criteria:

- Persistent Afib for more than 12 months
- Reversible cause of atrial fibrillation or heart failure
- Decompensated heart failure within 48 hrs prior to participation in study
- Use of antiarrhythmic drugs for other arrhythmias
- 2nd and 3rd degree AV block
- Hx of long QT syndrome
- Previous ablation of AV node
- Pending cardiac transplant in 6 months
- Renal failure requiring hemodialysis
- Child-bearing age women not on birthcontrol
- Life expectancy of less than 1 yr
- 18 yrs of age or less

Randomization: Patient were **randomly** assigned to rate vs rhythm control group **unblinded**
N= 1376 of this → 682 rhythm control group ; 647 rate control group

Therapies

Rhythm control	Rate control
-Medical therapy was first attempted: Amiodarone with sotalol/dofetilide if needed -Cardioversion within 6 weeks of the study if failed medical therapy and additional cardioversion for subsequent recurrences of AFib - permanent pacemaker was recommended if bradycardia prevented use of antiarrhythmics	- Medical therapy with mainly beta-blocker/digitalis, HR goal 80 at rest and 110 during 6 minute walk test -AV nodal ablation and pacemaker were recommended for pts who failed medical therapy
Therapy for Heart Failure -ACEI/ARB (90% of both) -maximum tolerated dose of BB -anticoagulation (90% of both)	

Patient characteristics: see Table 1, mean age 67 with predominant male population, 31% were NYHA class III or IV, mean LVEF was 27+/-6%, CAD was the predominant cardiac diagnosis

Follow up: 3 weeks, 4 months and every 4 months thereafter until 48 months, and subsequently every 6 months (see figure 1)

Rhythm group: AFib at baseline 54%-->33% at 3 weeks and 17% at 4 months and 27% at 4 year follow up

Rate control group: prevalence of afib in 59-70% during follow up and 72-88% of patients met HR guidelines during first 3 years of follow up

*** 142 patients in the rhythm-control group crossed over to the rate control group. Most common reason was inability to maintain sinus rhythm. And 66 patients in the rate control group who crossed over to the other group, most common reason was worsening heart failure.

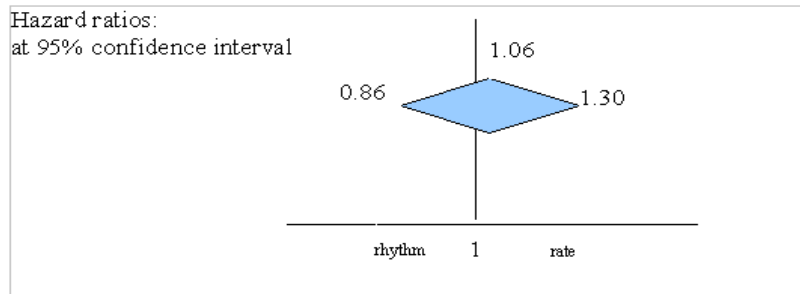
Outcomes: (Table 3)

1. Primary Outcome

- **Death from cardiovascular causes:** Rhythm control -182 patients (27%) vs rate control group 175 patients (25%). Figure 2

2. Secondary Outcome

- **Death from any causes include stroke, worsening CHF, sepsis:** overall composite of death of different causes was similar between 2 groups. Table 3



Comments:

- The rhythm control group required more hospitalizations (64% vs 59% p=0.06), most of these were for atrial fibrillation and bradyarrhythmia
- A higher proportion of patients in the rhythm control group required cardioversion (59% vs 9%, P<0.001)
- Although the goal of the study was to evaluate rhythm vs rate, the two groups were not exclusive the rhythm group had recurrence of Afib and not all the patients in the rate control group remained in Afib
- The toxicity of the antiarrhythmic drugs may have contributed to the lack of benefit seen in the rhythm control group
- Perhaps new trials of ablation vs rate control should be performed to exclude toxicity of meds in examining benefit between rate vs rhythm.