**Rhythm control strategies were not better than rate control strategies for atrial fibrillation**


**QUESTION:** Is a long term rate control strategy as effective as a rhythm control strategy for atrial fibrillation (AF)?

**Design**
Randomised (allocation concealed†), blinded (outcome assessors and monitoring committee‡), rate controlled trial with a mean follow up of 3.5 years (Atrial Fibrillation Follow up Investigation of Rhythm Management [AFFIRM] study).

**Setting**
213 clinical sites in North America.

**Patients**
4060 patients who were ≥ 65 years of age (mean age 70 y, 61% men) or had other risk factors for stroke or death; had AF that was likely to be recurrent, likely to cause illness or death, and warranted long term treatment; and had no contraindications to anticoagulants. Follow up was 98%.

**Intervention**
2027 patients were allocated to rate control using the following drugs alone or in combination as selected by the treating physician: β blockers, calcium channel blockers (verapamil and diltiazem), or digoxin. Target heart rate was ≤ 80 beats/min at rest and ≤ 110 beats/minute during the 6 minute walk test. Continuous anticoagulation was required. 2033 patients were allocated to rhythm control using the following antiarrhythmic drugs alone or in combination: amiodarone, disopyramide, flecainide, moricizine, procainamide, propafenone, quinidine, sotalol, or dofetilide. Cardioversion could be used if necessary. Continuous anticoagulation was encouraged, but could be stopped if sinus rhythm was maintained for ≥ 4, but preferably 12, consecutive weeks with antiarrhythmic drugs.

**Main results**
Analysis was by intention to treat. During the course of the study, 248 patients crossed over from the rate control group to the rhythm control group, and 594 patients from the rhythm control group crossed over to the rate control group. The rate control and rhythm control groups did not differ for death (table) or the secondary composite endpoint (32.7% ± 32.0%, p=0.33).

**Conclusion**
A rate control strategy and a rhythm control strategy had similar effects on mortality and cardiovascular morbidity in patients with atrial fibrillation.

*See glossary.
†Information provided by author.
Rate control was not inferior to rhythm control for recurrent persistent atrial fibrillation


QUESTION: Is rate control inferior to rhythm control for persistent atrial fibrillation (AF)?

Design
Randomised [allocation concealed*†], blinded [outcome assessors and monitoring committee]*† controlled, non-inferiority trial with mean follow up of 2.3 years (Rate Control vs Electrical Cardioversion for Persistent Atrial Fibrillation [RACE] Study).

Setting
31 centres in the Netherlands.

Patients
522 patients (mean age 68 years, 63% men) with recurrent persistent AF or flutter, 1–2 electrical cardioversions during the previous 2 years, and no contraindications to oral anticoagulation. Exclusion criteria were arrhythmia lasting >1 year, New York Heart Association class IV heart failure, current or previous treatment with amiodarone, or a pacemaker. All patients were included in the analysis.

Intervention
256 patients were allocated to rate control, which comprised digitals, a non-dihydropyridine calcium channel blocker, and a β-blocker; alone or in combination. Target resting heart rate was <100 beats/minute. 266 patients were allocated to rhythm control and had electrical cardioversion without previous treatment with antiarrhythmic drugs. Criterion for non-inferiority was an upper boundary of the 90% confidence interval (CI) ≤10% for the difference between the incidence of the primary endpoint in the rate control group and the rhythm control group.

Main outcome measure
A composite endpoint of death from cardiovascular causes, heart failure, thromboembolic complications, bleeding, need for pacemaker implantation, or severe adverse effects of antiarrhythmic drugs. Criterion for non-inferiority was an upper boundary ≤10%.

Main results
Analysis was by intention to treat. The rate control group was not inferior to the rhythm control group for the primary endpoint (table) or for the individual components of death from cardiovascular causes, heart failure, thromboembolic complications, bleeding, or pacemaker implantation. The rate control group had fewer severe adverse effects of antiarrhythmic drugs (table).

Conclusion
Rate control was not inferior to rhythm control for persistent recurrent atrial fibrillation and was associated with fewer severe adverse effects from antiarrhythmic drugs.

†See glossary.
*Information provided by author.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Rate control</th>
<th>Rhythm control</th>
<th>Absolute difference (90%, CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite endpoint</td>
<td>17.2%</td>
<td>22.6%</td>
<td>-5.4% (-11.0 to 0.4)</td>
</tr>
<tr>
<td>Severe adverse effects</td>
<td>0.6%</td>
<td>4.5%</td>
<td>-3.7% (-6.0 to -1.4)</td>
</tr>
</tbody>
</table>

†Abbreviations defined in glossary; composite endpoint death from cardiovascular causes, heart failure, thromboembolic complications, bleeding, need for pacemaker implantation, or severe adverse effects of antiarrhythmic drugs. Criterion for non-inferiority was a CI upper boundary ≤10%.

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