Rhythm vs rate control of atrial fibrillation meta-analysed by number needed to treat
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CRD summary
This review looked at rate control versus rhythm control for atrial fibrillation. The authors found that rate control was associated with a lower incidence of hospitalisation, but there were little other differences in outcomes. They concluded that rate control was preferable. There were a number of problems with the review and the conclusion may not, therefore, be reliable.

Authors’ objectives
To compare the effects of rate control versus rhythm control for the treatment of atrial fibrillation (AF).

Searching
PubMed, MEDLINE and the Cochrane Library were searched; the search terms were given. Only studies with an English abstract were eligible for inclusion.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) with 200 or more participants were eligible for inclusion.

Specific interventions included in the review
Studies comparing rhythm control strategies with rate control strategies were eligible for inclusion.

Participants included in the review
Studies of people with spontaneously occurring AF were sought. The participants in the included studies had persistent or recurrent AF. Between 59 and 74% were men and the mean ages ranged from 60 to 70 years. The rhythm control treatments included electrical cardioversion, amiodarone, disopyramide, flecainide, morcizine, procainamide, propafenone, quinidine, sotalol, dofetilide, class I anti-arrhythmics, or combinations of these. The rate control treatments involved the use of verapamil, diltiazem, beta-blockers, digitalis, amiodarone or AV node ablation and pacemaker, or combinations of these. In addition, oral anticoagulation was mandatory or encouraged.

Outcomes assessed in the review
The outcomes of interest were all-cause death, hospitalisation, non-central nervous system (CNS) bleeding and ischaemic stroke. Reported adverse effects and quality-of-life scores (using the Medical Outcomes short-form health survey, SF-36) were also assessed.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Relative risk reductions with 95% confidence intervals (CIs), as well as numbers-needed-to-treat (NNT) relative to follow-up periods (NNT-year) with 95% CIs, were calculated for the outcomes in the individual studies.
Methods of synthesis
How were the studies combined?
The pooled NNT and 95% CI were calculated. Trials were weighted according to sample size and average follow-up time.

How were differences between studies investigated?
The authors said that heterogeneity was assessed using a meta-analysis software program.

Results of the review
Five RCTs (5,239 participants) were included.

All studies used intention-to-treat analysis, though only two reported using concealed allocation.

Hospitalisation was significantly reduced with the rate control strategy (NNT-year 1 = -35, 95% CI: -48, -27) in comparison with the rhythm control strategy. There was statistically significant heterogeneity between trials (P<0.001). There were no significant differences between treatment strategies for death, non-CNS bleeding or ischaemic stroke.

Quality-of-life scores showed similar improvements with both treatments (2 trials).

More adverse events occurred with rhythm control strategies than with rate control strategies. These included tachycardia, prolonged QT interval, sick sinus syndrome/atrioventricular block, ventricular fibrillation and heart failure. Adverse events associated with the rate control strategy included non-lethal digitalis intoxication and oedema.

Authors' conclusions
The reduced risk of hospitalisation and no difference in other outcomes means that rate control, the less costly strategy, should be favoured.

CRD commentary
The aims of this review were clearly stated. The search was limited to studies with abstracts in English, no dates for the search were given, and there did not appear to have been any attempt to identify unpublished studies; it is therefore possible that studies were missed. However, a similar review identified only the same five studies (see Other Publications of Related Interest). The methods of the review (study selection, validity assessment, data extraction) were not described, and there was also no mention of any quality assessment. It is possible for bias or error to be introduced into a review during these stages. The authors pooled the NNT rather than using the probability difference (odds ratio, relative risk or hazard ratio) and then calculated the NNT from the pooled estimate. Since the former is generally regarded as inappropriate and there was also evidence of statistical heterogeneity, the pooled NNT may not be reliable. The authors included the influence of cost implications of treatment in their conclusions but did not present any data on costs within the review.

Implications of the review for practice and research
Practice: If symptoms of rate control are not a problem then this strategy should be preferred and thromboembolic prophylaxis maximised.

Research: The authors did not state any implications for further research.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.