CRD summary

Catheter ablation and anti-arrhythmic drug therapy were associated with similar rates of survival and stroke/transient ischaemic attack in patients with atrial fibrillation. Findings could probably be explained by the included low-risk populations and relatively short–term follow-up. There were limitations in reporting of review methods, but overall the authors' conclusions appear to be supported by the evidence presented.

Authors' objectives

To compare the effects on mortality of catheter ablation versus anti-arrhythmic drug therapy in patients with atrial fibrillation.

Searching

PubMed and Cochrane Central Register of Controlled Trials (CENTRAL) were searched from 2000 to January 2009 using reported search terms. No language restrictions were applied. In addition, reference lists of retrieved studies and abstracts of four specified conferences were searched.

Study selection

Randomised controlled trials (RCTs) that compared catheter ablation with anti-arrhythmic drug therapy in patients with atrial fibrillation were eligible for inclusion. The primary review outcome was all-cause mortality during follow-up. The secondary outcome was stroke or transient ischaemic attack.

The included trials used pulmonary vein antral ablation or circumferential pulmonary vein ablation combined with linear lesions in the left and right atria, with ablation of non-venous foci in some patients. Trials used a variety of anti-arrhythmic drugs, including a wide variety of class I and class III agents or combinations; amiodarone was used as a drug candidate in all but one trial.

In most trials patients had failed to respond to at least one anti-arrhythmic drug; in three trials patients had not previously used a membrane active anti-arrhythmic drug. Most trials were in patients with paroxysmal or persistent atrial fibrillation; one trial was in patients with chronic atrial fibrillation. The authors stated that trials were in low-risk populations with a mean age ranging from 51 to 65 years, with low rates of structural heart disease (excluding hypertension) in most trials. Included trials used different oral anti-coagulation regimens in ablation treatment groups; in most trials oral anti-coagulation was discontinued after six weeks to six months in the absence of recurrence of the arrhythmia. The duration of follow-up was one year in all except one trial, in which follow-up was nine months.

The authors did not state how many reviewers selected studies.

Assessment of study quality

Validity was assessed using a modification of the Jadad scale that scored the randomisation method and reporting of withdrawals and drop-outs. Blinding was not assessed, since it was not applicable to the comparison of an intervention with drug therapy.

It was not clear how many reviewers assessed validity.

Data extraction

Authors of trials in which there was no explicit statement about the absence of deaths were contacted for confirmation of the absence of deaths.
Two reviewers independently extracted data and resolved disagreements by consensus.

**Methods of synthesis**
Pooled risk differences (RD) with 95% confidence intervals (CI) were calculated using the fixed-effect Mantel-Haenszel method. Data were analysed on an intention-to-treat basis. Heterogeneity was assessed using the $I^2$ statistic. Publication bias was assessed using a funnel plot and Egger’s test. Sensitivity analysis was performed based on the number of patients in each study (less than 100 versus over 100). Data were also analysed using various scenarios for the three patients who were lost to follow-up.

**Results of the review**
Eight RCTs were included (n=930 patients). Quality scores ranged from 1 to 3 out of 3 points; four trials scored 3 points.

There was no significant difference between catheter ablation and anti-arrhythmic drugs in mortality (three deaths in ablation groups versus four deaths in anti-arrhythmic drug groups). No significant heterogeneity was found. There was no evidence of publication bias from the funnel plot or Egger’s test. Results were similar for trials with less than 100 and over 100 patients, and using different outcomes for the three patients who were lost to follow-up.

There was no significant difference between catheter ablation and anti-arrhythmic drugs in stroke or transient ischaemic attack (three in ablation groups versus one in anti-arrhythmic drug groups).

**Authors’ conclusions**
Catheter ablation and anti-arrhythmic drug therapy were associated with similar rates of survival and stroke/transient ischaemic attack in patients with atrial fibrillation. The findings could probably be explained by the inclusion of low-risk populations and relatively short-term follow-up.

**CRD commentary**
The review question was clear and supported by appropriate inclusion criteria. Several relevant sources were searched including sources of unpublished studies, but it was not clear if any language restrictions were applied. Methods were used to minimise reviewer error and bias during data extraction, but it was not clear if similar methods were used for study selection and validity assessment.

Trial validity was assessed, but only the scores were reported. Trials were pooled and heterogeneity was assessed. The small number of events in the low-risk populations studied meant that results may not be reliable. However, this limitation was discussed and acknowledged by the authors in their conclusions.

There were limitations in reporting of review methods, but overall the authors’ conclusions appear to be supported by the evidence presented.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implication for practice.

**Research:** The authors stated that further RCTs with prolonged follow-up are required.

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**Bibliographic details**