Curative ablation for atrial fibrillation: a systematic review
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CRD summary
This systematic review concluded that catheter ablation was more effective than drug therapy for atrial fibrillation, but that data on adverse effects was sparse. The review appeared to have been reasonably well conducted, although poor reporting limited the assessment of some sources of bias. The authors’ conclusions reflected the evidence presented, but the low quality of the included studies limited the reliability of the conclusions.

Authors' objectives
To assess the effectiveness of catheter ablation for atrial fibrillation.

Searching
MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, EMBASE, The Cochrane Library, meta Register of Controlled Trials and relevant websites were searched to May 2007.

Study selection
Randomised controlled trials (RCTs) of catheter ablation compared with pharmacological treatment, surgical maze-procedures or palliative AV-nodal ablation with pacemaker insertion for patients with paroxysmal, persistent or permanent atrial fibrillation were eligible for inclusion. Primary outcomes of interest included: mortality; strokes; the proportion of patients with recurrent atrial fibrillation at six months and one year; the proportion of patients who were in sinus rhythm without the use of antiarrhythmic drugs; and quality of life. Secondary outcomes of interest included repeat ablation, cardiovascular mortality and complications.

The included studies compared catheter ablation with pharmacological treatment (including amiodarone, flecainide or sotalol alone or in combination, or antiarrhythmic drug therapy of the physician’s choice) or no treatment. In one study participants in both treatment arms also received warfarin. Participants were patients with paroxysmal, persistent or chronic atrial fibrillation who had either not been previously treated for atrial fibrillation or who did not tolerate or respond satisfactorily to drug treatment. ECG follow-up was extensive in the included studies.

Two reviewers independently screened titles and abstracts of identified papers for eligibility. The authors did not report how full papers were assessed for eligibility.

Assessment of study quality
The authors stated that the quality of the included studies was assessed using internationally accepted checklists, however, they did not specify which checklists were used. Studies were classified as high, medium, low or very low quality. The level of evidence was graded according to the GRADE system. The authors did not state how the validity assessment was performed.

Data extraction
The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
Statistical heterogeneity was assessed using the $I^2$ statistic. A narrative synthesis was presented.

Results of the review
Five RCTs were included in the review (n=578). The methodological quality of the studies was low.

Catheter ablation was more effective at preventing recurrence of atrial fibrillation than either pharmacological treatment or no treatment. After one year atrial fibrillation was present in 25 per cent of patients who received catheter ablation compared with 67 per cent of patients who received pharmacological treatment or no treatment. Meta-analysis
was not performed, because of significant heterogeneity ($I^2 = 73\%$).

Two patients who received catheter ablation died (one from a stroke and the other pneumonia). There was one other stroke case, one case of moderate pulmonary vein stenosis, one case of transitory paresis of the phrenic nerve, one transient ischemic attack, one case of groin haematoma and two patients required pericardial drainage.

One control-group patient died. One study reported 23 per cent withdrawal from treatment due to adverse effects from amiodarone, flecainide and/or sotalol (alone or in combination). One study reported that 47 per cent of patients taking amiodarone suffered from adverse effects.

**Authors’ conclusions**
Catheter ablation was more effective than drug therapy for the prevention of recurrence of atrial fibrillation, but data on adverse effects was sparse.

**CRD commentary**
This review addressed a clear question and was supported by appropriate inclusion criteria. Several sources were searched in an attempt to identify relevant studies, including sources of unpublished data, reducing the potential for publication bias. The authors did not state whether any language restrictions were applied, so it was not possible to assess the potential for language bias. Validity was assessed using published checklists, but specific checklists or criteria used to assess validity were not reported and the results of the validity assessment were not reported fully. The authors stated that the included studies suffered from serious limitations and were categorised as low quality. The processes of study selection, data extraction and validity assessment were not fully reported, therefore, the potential for reviewer bias and error could not be assessed. Heterogeneity was assessed and found to be significant, therefore, a narrative synthesis was presented, which was appropriate. This systematic review appeared to have been reasonably well conducted, although poor reporting limited the assessment of some sources of bias. The authors’ conclusions reflected the evidence presented, but the low quality of the included studies meant that the conclusions should be interpreted with caution.

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

Research: The authors stated that randomised controlled trials with longer follow-up were required to assess the effectiveness of catheter ablation for atrial fibrillation.

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