Catheter ablation of atrioventricular nodal reentrant tachycardia and bypass tract mediated tachycardias

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Radiofrequency (RF) catheter ablation in the management of cardiac arrhythmias.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with cardiac arrhythmias (AVNRT and accessory pathways).

Setting
Hospital. The economic study was carried out in Michigan, USA.

Dates to which data relate
For the effectiveness analysis the studies reviewed were published in 1991-1995. The resource use data corresponded to patients treated in 1990 (for the intervention) and in 1989 (for the comparator). The fiscal year was 1991.

Source of effectiveness data
Effectiveness data were derived from a review of previously published studies.

Outcomes assessed in the review
The review assessed success rates (which, in the case of AVNRT, was defined as the abolition of AVNRT with or without the creation of inadvertent AV block), complication rates and rate of recurrence of arrhythmias.

Study designs and other criteria for inclusion in the review
Clinical series.

Sources searched to identify primary studies
Not reported.

Criteria used to ensure the validity of primary studies
Not reported.

**Methods used to judge relevance and validity, and for extracting data**
No reported.

**Number of primary studies included**
A total of 19 studies was included: 5 studies relevant to AVNRT using anterior approach, 7 using the posterior approach, and 9 relevant to accessory pathways.

**Methods of combining primary studies**
Weighted average rates of success, recurrence, and complications were calculated.

**Investigation of differences between primary studies**
Not reported.

**Results of the review**
The average success rate of the anterior approach was 96%, with a recurrence rate of 9% and a complication rate of 7%. For the posterior approach, the success rate was 97%, while the recurrence rate was 3% and the complication rate 1%. The success rate was 93% for the treatment of accessory pathways, with a recurrence rate of 7% and a complication rate of 2%.

**Measure of benefits used in the economic analysis**
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

**Direct costs**
Costs were not discounted for lifelong therapies. Some broad quantities were reported. The cost analysis covered the operating costs and the costs of complications. The boundary adopted was the hospital. The cost calculations were based on actual data. Charges were used as a proxy for costs (except for the reported cost:charge ratio for hospital charges in the treatment of accessory pathways). The cost analysis was based on two previously completed studies published in 1991 and 1992. The prices were reflated to 1991 values.

**Statistical analysis of costs**
Unpaired t test was used to compare the costs of RF and surgical ablation.

**Indirect Costs**
Quantities were reported for "days lost from work". However, these were not included in the costing. The source of these data was a series of telephone interviews with the patients.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was conducted.
Estimated benefits used in the economic analysis
Not applicable.

Cost results
The cost per catheter ablation procedure for accessory pathways was reported as being $14,919 (SD, $6,740), compared with $53,265 ($12,755) for arrhythmia surgery, (p<0.0001). The catheter modification of AV was estimated to be $15,893 (SD, $3,338), whereas the average cost of medical therapy for the year before RF modification was $7,651 (SD, $8,496). The lifelong medical therapy based on an assumption of 1 ER visit/year was more expensive than catheter modification after about 10 years.

Synthesis of costs and benefits
Not carried out.

Authors’ conclusions
The cost of catheter ablation procedures compares well with the cost of arrhythmia surgery and the cost of lifelong antiarrhythmic therapy. The cost-effectiveness of catheter ablation has recently been further improved by the elimination of routine follow up electrophysiology procedures following ablation procedures, elimination of routine echocardiograms prior to and following the ablation procedure, and shorter hospital stays. The feasibility of performing catheter ablation procedures on an outpatient basis has recently been demonstrated and is likely to gain more widespread acceptance in the future.

CRD COMMENTARY - Selection of comparators
The comparison with surgery or lifelong medical therapy was not explicitly justified but appears sensible. You, as a database user, should consider whether these are widely used health technologies in your own setting.

Validity of estimate of measure of benefit
The search for the primary studies does not appear to have been systematic and therefore, the studies included may be subject to bias. No data on the comparative success rate of surgery or medical therapy were presented so the implicit assumption in the paper that RF catheter ablation is as effective was not substantiated.

Validity of estimate of costs
Only broad quantities of resources were reported separately from the costs. Insufficient details of the methods of cost estimation were given in the main paper (however, they are given in the reference papers). The cost analysis was not performed on the same patient sample as that used in the effectiveness analysis. The costs of life-long medical therapy were not discounted even though the time frame adopted was 20 years or more.

Other issues
In view of the apparent lack of a comprehensive literature review and quality appraisal of the primary studies included in the review, and of sensitivity analysis, the results may need to be treated with some caution.

Source of funding
None stated.

Bibliographic details
Orias D W, Calkins H. Catheter ablation of atrioventricular nodal reentrant tachycardia and bypass tract mediated