Cost effectiveness of inpatient initiation of antiarrhythmic therapy for supraventricular tachycardias


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
Inpatient antiarrhythmic therapy initiation for supraventricular tachycardias.

Type of intervention
Treatment; Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
A hypothetical population of patients treated with oral monotherapy with disopyramide, flecainide, propafenone, quinidine or sotalol for supraventricular tachycardias.

Setting
Community and hospital. The economic study was performed in North Carolina, USA.

Dates to which data relate
Effectiveness data were retrieved from studies published in the period January 1966-November 1995 and institutional charge data. Professional costs refer to 1996. The date of the remaining costs was not clearly stated.

Source of effectiveness data
The effectiveness data were derived from a meta-analysis of published drug trials and expert opinion.

Modelling
A decision tree was constructed using commercially available software (TreeAge, Williamstown, Massachusetts) to evaluate the cost and benefits of inpatient versus outpatient initiation of antiarrhythmic therapy for supraventricular tachycardias.

Outcomes assessed in the review
The outcomes assessed in the review were as follows: number of sudden deaths, cardiac arrest requiring resuscitation, syncope, and sustained or unstable ventricular arrhythmias.

Study designs and other criteria for inclusion in the review
English language studies which satisfied the following criteria were included in the study: trials of oral monotherapy in
patients with atrial fibrillation, atrial flutter, ectopic atrial tachycardia, or atrioventricular reciprocating tachycardia; therapy duration longer than 48 hours and studies which included at least 10 patients without concomitant ventricular arrhythmias.

Exclusion criteria were: trials in which more than 50% of the subjects were younger than 18 years; studies with loss to follow up during the first 72 hours; studies performed immediately after surgery or myocardial infarction; studies of patients previously treated with the same drug; proceedings of symposia sponsored by single pharmaceutical companies. Finally, in the case of double reporting studies, only the first published study was chosen.

Sources searched to identify primary studies
An electronic search in MEDLINE was performed using the following key words: antiarrhythmia agents, tachycardia, supraventricular, atrial fibrillation.

Criteria used to ensure the validity of primary studies
Studies were assessed for the following methodological flaws: retrospectively identified patient populations; internal selection of patients for therapy; failure to report age and gender of treated patients; failure to report structural heart disease status of treated patients, and unclear description of treatment protocol.

Methods used to judge relevance and validity, and for extracting data
The judgement criteria applied by the authors to assess the validity of primary studies were not reported. Individual data regarding effectiveness were retrieved from each study.

Number of primary studies included
Effectiveness data were retrieved from 52 different studies.

Methods of combining primary studies
Meta-analysis. Effectiveness data results from each study were pooled and adjusted for variations in sample size.

Investigation of differences between primary studies
Possible sources of data heterogeneity among studies do not appear to have been investigated.

Results of the review
Effectiveness data from 52 studies were pooled and adjusted for variations in sample size to obtain a weighted-average event rate of 0.63% during the first 72 hours (95% CI: 0.22% - 1.2%). Only 20 out of the 53 identified events occurred during the first 72 hours.

Methods used to derive estimates of effectiveness
Estimates of effectiveness were also derived from the authors' assumptions

Estimates of effectiveness and key assumptions
The death rate among hospitalized patients was assumed to be zero, whereas, the mortality rate for outpatient events was assumed to be one.

Measure of benefits used in the economic analysis
Benefits were measured in terms of life-years gained. Life expectancy rates per specific patient group were obtained
from USA population-based life tables.

**Direct costs**
Health service costs were considered, including costs of diagnostic tests, therapeutic agents, and hospital rooms which were obtained from the Duke University Cost Accounting Office database. Costs for physician services were based on the 1996 North Carolina Medicare Reimbursement Schedule. Costs were not reported separately from resource quantities and were not discounted.

**Indirect Costs**
Not stated.

**Currency**
US dollars ($).

**Sensitivity analysis**
Multi-way simple sensitivity analysis was performed on weighted-average event rate, mortality rates, life expectancies, and side effect rate. Threshold values for inpatient treatment to remain cost effective were: expected life-years gained greater than 6.7 and rate event greater than 0.24%. The model was insensitive to changes in side-effect rates. The results were sensitive to variations in discount rate only when these were combined with extremely high changes in additional years of life gained.

**Estimated benefits used in the economic analysis**
For a prototypical 60-year-old patient, an additional 21.1 years of life were estimated. A 3% annual discounting rate was used to obtain a baseline of 15.5 discounted life years gained.

**Cost results**
The total costs of the intervention and the comparator were not reported. The marginal cost of the inpatient strategy was $1,874.

**Synthesis of costs and benefits**
The estimated baseline cost per year of life saved was $19,231.

**Authors' conclusions**
The authors assumed a threshold value of $50,000 for a health intervention to be considered as economically attractive. Based on this assumption the authors concluded that inpatient initiation of antiarrhythmic therapy for supraventricular tachycardias was a cost-effective procedure. Structural heart disease was identified as a probable risk factor for ventricular proarrrhythmia among patients treated for supraventricular tachycardias, the proportion of the increment in risk was not clear.

**CRD COMMENTARY - Selection of comparators**
The rationale for the selection of the comparator, outpatient therapy initiation, was clearly stated. You, as a database user should consider, whether this is a widely used practice in your own setting.

**Validity of estimate of measure of benefit**
The authors estimated life-years gained based on data from the USA population, while no information regarding
comparability to the studies included in the meta-analysis was provided. Therefore, the results should be treated with some caution.

**Validity of estimate of costs**
The authors pointed out that many of their assumptions regarding clinical management were arbitrary in nature, consequently the estimation of costs is prone to bias. In addition, no attempt appears to have been made to investigate the sources of clinical management heterogeneity among studies.

**Other issues**
The well identified limitations of meta-analysis were mentioned by the authors, but no clear attempt to consider them in the analysis was reported. The authors did not provide information regarding the types of studies included in the analysis.

**Implications of the study**
There is a need for clinical studies to verify the cost-effectiveness of inpatient initiation of antiarrhythmic therapy for supraventricular tachycardias.

**Source of funding**
None stated.

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