A cost-effectiveness clinical decision analysis model for schizophrenia

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
Anti-psychotic treatment strategies for patients with schizophrenia.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis and cost-utility analysis.

Study population
Hypothetical cohort of patients who had experienced multiple episodes of schizophrenia. Patients with first-episode schizophrenia and treatment-resistant schizophrenia were not considered.

Setting
Hospital and community. The study was carried out in Bethesda, Maryland, USA.

Dates to which data relate
Effectiveness data were collected from studies previously published between 1986 and 1997. Resource use data were collected from 1994-1996 sources. The price year was 1995.

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

Modelling
A decision analytic Markov model was employed to estimate costs and outcomes of the treatment strategies over a five year period.

Outcomes assessed in the review
The review assessed the following outcomes: therapy discontinuation rates, relapse rates, and symptom transition rates.

Study designs and other criteria for inclusion in the review
The parameter values for the model were taken from two international double-blind clinical trials and from the published medical literature when clinical trial results were unavailable.
Sources searched to identify primary studies
Not stated.

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

Methods used to judge relevance and validity, and for extracting data
Summary statistics from each study.

Number of primary studies included
Approximately 7 studies were included.

Methods of combining primary studies
Narrative method.

Investigation of differences between primary studies
Not stated.

Results of the review
Discontinuation rates varied between 27.1% (olanzapine) and 49.2% (haloperidol) in months 0-3, between 13.1% (olanzapine) and 17% (haloperidol) in months 4-6, between 6.1% (risperidone) and 8.4% (haloperidol) in months 7-9 and between 4.7% (risperidone) and 8.6% (haloperidol) in months 10-12. Relapse rates per cycle over a 5-year period ranged from 2.35% to 4.9% for olanzapine, from 2.35% to 5.9% for risperidone, from 3.29% to 7% for haloperidol and from 2.23% to 49.5% without therapy.

Methods used to derive estimates of effectiveness
Experts' opinion from an 11-member international advisory panel composed of psychiatrists and health economists were also used to provide estimates of effectiveness.

Estimates of effectiveness and key assumptions
For the initial 3-month cycle, the suicide attempt rate was assumed to be 2%, irrespective of drug treatment. For subsequent cycles, estimates for the suicide attempt rate were 1% for olanzapine, 2% for haloperidol, and 2% for risperidone. Treatment discontinuations occur only in the first 12 months of therapy.

Measure of benefits used in the economic analysis
Three measures of benefits were used: the proportion of patients whose last available Brief Psychiatric Rating Scale (BPRS) total score was less than 18 during the 3-month cycles, quality-adjusted life years (QALYs), and the lack of relapse. It was assumed that the risperidone and olanzapine treatment groups had the same BPRS scores. The utilities used in the calculation of QALYs were estimated from standard gamble utilities assigned to hypothetical schizophrenia-related health states by 12 psychiatrists in the UK, as well as from unpublished data on the differences between standard gamble utilities for haloperidol health states and utilities for atypical anti-psychotic health states. The same QALYs were used for both the olanzapine and risperidone treatment groups. Benefit measures were discounted at an annual rate of 5%.

Direct costs
Direct costs were discounted at an annual rate of 5%. Quantities and resources were reported separately. Direct costs included costs of hospital, day hospital, outpatient physician and other mental health providers, laboratory tests, medications, suicides and suicide attempts. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on expert opinion and the published literature. Costs were inflated to 1995 dollars by using the appropriate Medical inflator from the Consumer Price Index.

**Statistical analysis of costs**
Not reported.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was conducted on the following parameters: the inpatient length of stay, discount rate, suicide attempt rate, and drug dosage.

**Estimated benefits used in the economic analysis**
Treatment with olanzapine generated a BPRS score of 3.18, 3.15 QALYs and a 31.2% non-relapse rate. Treatment with haloperidol generated a BPRS score of 2.61, 2.96 QALYs, and an 18.2% non-relapse rate. Treatment with risperidone generated a BPRS score of 3.15, 3.12 QALYs and a 29.3% non-relapse rate.

**Cost results**
Costs associated with olanzapine, haloperidol and risperidone treatment amounted to $92,593, $94,132 and $94,468 respectively.

**Synthesis of costs and benefits**
Costs and benefit results were not combined into cost-effectiveness or cost-utility ratios. Olanzapine provided better outcomes at a lower cost compared to both haloperidol and risperidone and can therefore be assumed to be the dominant (base case) strategy. These results were sensitive to changes in drug costs and shortened hospital stay.

**Authors' conclusions**
Compared with both haloperidol and risperidone therapy, olanzapine therapy was less expensive and provided superior effectiveness outcomes even with conservative values for key parameters such as relapse and discontinuation rates.

**CRD COMMENTARY - Selection of comparators**
Rationale for the choice of the comparators was clear. You, as a user of this database, should verify whether these health technologies are relevant to your setting.

**Validity of estimate of measure of benefit**
Relevant measures of benefits were considered. More details about the literature review could have been provided. The results depend on the assumptions of the model and the quality of the data. In many cases the authors assumed that parameters for risperidone were similar to those of olanzapine; thus, the model may tend to under-estimate the cost-
effectiveness of olanzapine compared with risperidone. There are important differences between haloperidol therapy and olanzapine or risperidone therapy in measures of health utility. The extent to which the outcomes included in this model adequately capture these effects is uncertain. The authors assumed that the BPRS-based outcomes and utilities associated with risperidone are equivalent to those associated with olanzapine. Most effectiveness data were collected from two studies in which the patients may represent a biased sample because they had agreed to participate in a long-term follow-up study.

Validity of estimate of costs

direct costs were included. The cost estimates were based on expert opinion and on the published literature.

Other issues

authors employed a rigorous and thorough approach in conducting this modelled study. However, given the assumptions of the model and the quality of the data, the results may not be generalisable to other settings or countries. Adequate comparisons with other studies were not made.

Implications of the study

The solution suggests that 5-year treatment costs are lower with olanzapine which also provides better quality of life. Future prospective studies are needed for direct measurement of health utilities in patients with schizophrenia treated with haloperidol, olanzapine or risperidone.

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Bibliographic details


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Other publications of related interest


Indexing Status

Subject indexing assigned by NLM

MeSH

Antipsychotic Agents /economics /therapeutic use; Benzodiazepines; Clozapine /economics /therapeutic use; Cost-Benefit Analysis; Decision Support Systems, Clinical /economics /standards; Haloperidol /economics /therapeutic use; Humans; Markov Chains; Pirenzepine /analogs & derivatives /economics /therapeutic use; Quality-Adjusted Life Years; Risperidone /economics /therapeutic use; Schizophrenia /drug therapy /economics /physiopathology; Treatment Outcome; United States