Cost analysis of the treatment of schizophrenia in Thailand: a simulation model comparing olanzapine, risperidone, quetiapine, ziprasidone and haloperidol

Kongsakon R, Leelahanaj T, Price N, Birinyi-Strachan L, Davey P

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

Several medications for schizophrenia were examined. The four atypical antipsychotics studied were olanzapine (OLZ), risperidone (RISP), quetiapine (QUET) and ziprasidone (ZIP), and the one typical antipsychotic was haloperidol (HAL). All medications were given at the daily defined dose: HAL 8 mg, QUET 400 mg, ZIP 80 mg, RISP 5 mg and OLZ 10 mg.

Type of intervention

Treatment.

Economic study type

Cost-effectiveness analysis.

Study population

The study population comprised a hypothetical cohort of patients with schizophrenia.

Setting

The setting appears to have been secondary care. The economic study was carried out in Thailand.

Dates to which data relate

The effectiveness data and some resource use data were derived from studies published between 1991 and 2003. A unique price year was not reported.

Source of effectiveness data

The effectiveness evidence was derived from a synthesis of published studies.

Modelling

The authors stated that a model was used to assess the costs of the five alternative treatments for schizophrenia over a 12-month time horizon. However, details of the model were not reported.

Outcomes assessed in the review

The outcomes estimated from the literature were indicators of efficacy and safety for the medications examined in the study. These included anticholinergic use, dropouts (for any reason, for adverse events, or for lack of efficacy), and changes in the Positive and Negative Syndrome Scale (PNSS) and the Brief Psychiatric Rating Scale (BPRS).

Study designs and other criteria for inclusion in the review

A review of the literature was undertaken to identify primary studies providing data on the efficacy of treatment and tolerability. The design of the primary studies was not described in detail, but most of the studies appear to have been randomised clinical trials.

Sources searched to identify primary studies

EMBASE (from 1988 to week 42, 2003), MEDLINE (from 1966 to October week 2, 2003) and NHS EED were searched.

Criteria used to ensure the validity of primary studies

Not reported.

Methods used to judge relevance and validity, and for extracting data

Not reported.

Number of primary studies included

Of the 1,175 publications found from the literature, only 31 studies were included in the analysis.

Methods of combining primary studies

The method used to combine the primary studies was not explicitly stated, but weighted mean differences in efficacy between medications were calculated. The difference in tolerability and efficacy between OLZ and RISP and between OLZ and HAL were based on direct comparisons (head-to-head trials), while the difference in tolerability and efficacy between OLZ and QUET and between OLZ and ZIP were based on indirect comparisons (with HAL as the common comparator).

Investigation of differences between primary studies

Not reported.

Results of the review

Only statistically significant results will be reported here.

In the short-term, the risk difference in anticholinergic use was -0.06 (95% confidence interval, CI: -0.12 to -0.01; p=0.02) in favour of OLZ compared with RISP, -0.33 (95% CI: -0.37 to -0.30; p<0.00001) in favour of OLZ compared with HAL, and -0.21 (95% CI: -0.31 to -0.12; p<0.001) in favour of RISP compared with HAL.

In the short-term, the risk difference in dropouts for any reason was -0.14 (95% CI: -0.22 to -0.05; p=0.002) in favour of OLZ compared with HAL, -0.06 (95% CI: -0.10 to -0.02; p=0.002) in favour of RISP compared with HAL, and -0.1 (95% CI: -0.20 to -0.00; p=0.049) in favour of OLZ compared with QUET via HAL.

In the short-term, the risk difference in dropouts due to adverse events was -0.03 (95% CI: -0.05 to -0.01; p=0.003) in favour of OLZ compared with HAL.

In the short-term, the risk difference in dropouts due to lack of efficacy was -0.09 (95% CI: -0.12 to - 0.06; p<0.00001) in favour of OLZ compared with HAL.

In the long-term, the risk difference in anticholinergic use was -0.15 (95% CI: -0.23 to -0.07; p=0.003) in favour of OLZ compared with RISP, -0.51 (95% CI: -0.83 to -0.19; p=0.002) in favour of OLZ compared with HAL, -0.50 (95% CI: -0.93 to -0.07; p=0.023) in favour of OLZ compared with QUET via HAL, and -0.41 (95% CI: -0.75 to -0.07;

p=0.019) in favour of OLZ compared with ZIP via HAL.

In the long-term, the risk difference in dropouts due to any reason was -0.12 (95% CI: -0.22 to -0.03; p=0.008) in favour of OLZ compared with RIS, and -0.20 (95% CI: -0.34 to -0.07; p=0.004) in favour of OLZ compared with HAL.

In the long-term, the risk difference in dropouts due to lack of efficacy was -0.10 (95% CI: -0.19 to -0.01; p=0.03) in favour of OLZ compared with HAL.

Statistically significant results in favour of OLZ were also observed in terms of both short- and long-term efficacy variables. OLZ showed significantly better results in:

the PANSS total change, PANSS negative change and BPRS total change in comparison with RISP in the long term;

all efficacy measures compared with HAL, both in the short- and long-term period;

the PANSS total change and BPRS total change compared with QUET in the short term; and

the PANSS total change compared with ZIP in the short term.

Measure of benefits used in the economic analysis
The health outcomes were left disaggregated and no summary benefit measure was used in the economic study. In effect, a cost-consequences analysis was carried out.

Direct costs
The analysis of the direct costs appears to have been carried out from the perspective of the health care system. The direct costs included in the analysis were antipsychotics, anticholinergics, hospitalisations and relapse. The unit costs were presented separately from the quantities of resources used. Resource consumption was based on daily defined doses for drugs (with the exception of RISP), a published source for hospitalisations, and authors' assumptions for relapses. The sources used to derive the costs were not reported, with the exception of hospital stay, which was derived from the Ministry of Public Health in Thailand. Discounting was not relevant since the costs were incurred during 12 months. A unique price year was not explicitly reported.

Statistical analysis of costs
The costs appear to have been treated deterministically.

Indirect Costs
The indirect costs (i.e. productivity losses due to unemployment and suicide gestures or attempts) were included in the analysis. The unit costs were reported separately from the quantities of resources used. Resource use was derived from published data and authors' assumptions. The costs were derived using published sources and were based on monthly earnings in Thailand, after taking into account the low employment rate among schizophrenic patients. As in the analysis of the direct costs, discounting was not relevant and the price year was not reported.

Currency
Thailand bath (THB).

Sensitivity analysis
Sensitivity analyses were not performed.

Estimated benefits used in the economic analysis

See the ,Effectiveness Results- section.

Cost results

Annual medication costs were THB 70,715 with OLZ, THB 43,800 with RISP, THB 5,733 with HAL, THB 81,760 with QUET, and THB 49,458 with ZIP.

Other costs (including hospitalisations, other medications, productivity and suicide costs) were THB 32,477 with OLZ, THB 60,694 with RISP, THB 80,156 with HAL, THB 64,738 with QUET, and THB 68,784 with ZIP.

The total annual costs were THB 103,225 with OLZ, THB 104,564 with RISP, THB 86,004 with HAL, THB 146,526 with QUET, and THB 118,314 with ZIP.

Synthesis of costs and benefits

A synthesis of the costs and benefits was not relevant as a cost-consequences analysis was carried out.

Authors' conclusions

Olanzapine (OLZ) was a dominant treatment for schizophrenia in Thailand in comparison with risperidone (RISP), quetiapine (QUET) and ziprasidone (ZIP), and a cost-effective treatment in comparison with haloperidol (HAL).

CRD COMMENTARY - Selection of comparators

The selection of the comparators appears to have been appropriate for the objective of the analysis. Further, the dosages of each drug were reported. You should decide whether they are valid comparators in your own setting.

Validity of estimate of measure of effectiveness

The effectiveness data were estimated from published studies. A systematic review of the literature was undertaken to identify primary studies. Some information on the search methods (source and key words) was reported, but other details on the methods and conduct of the review were not given. Little information on the design and other characteristics of the primary studies was provided, thus it was not possible to assess the validity of the primary estimates. The comparisons between OLZ and RISP and between OLZ and HAL were based on head-to-head trials, whereas those between OLZ and QUET and OLZ and RISP were based on indirect comparisons (with HAL as common comparator). However, the issue of heterogeneity among the primary studies was not addressed. This represents a limitation of the study, in particular for those comparisons that were not based on head-to-head trials. Moreover, the approach used to combine the primary estimates was not described. The issue of variability in the data was addressed in the sensitivity analysis.

Validity of estimate of measure of benefit

No summary benefit measure was used in the analysis because a cost-consequences analysis was conducted. Please refer to the comments in the 'Validity of estimate of measure of effectiveness' field (above).

Validity of estimate of costs

The analysis of the costs included all relevant costs since both the direct and indirect costs were considered. The unit costs were presented separately from the quantities of resources used, which will help in replicating the study in other settings. The source of resource use was clearly reported for all items, whereas for most items the source of the unit costs was not given. The cost estimates were specific to the study setting and the impact of using alternative cost estimates was not investigated. Statistical tests were not carried out and the price year was not reported, which will hinder reflation exercises in other time periods.

Other issues

The authors did not compare their findings with those from other studies. They also did not address the issue of the generalisability of the study results to other settings. No sensitivity analyses were carried out, which limits the external validity of the study. The analysis referred to patients with schizophrenia and this was reflected in the authors' conclusions. The authors noted that the cost analysis was a strength of their study. The main limitation of the study was related to the effectiveness analysis and the lack of head-to-head trials for some comparisons. In addition, no cost-effectiveness ratio was provided for the comparison between OLZ and HAL.

Implications of the study

The study results supported the use of OLZ for the treatment of schizophrenia.

Source of funding

None stated.

Bibliographic details

Kongsakon R, Leelahanaj T, Price N, Birinyi-Strachan L, Davey P. Cost analysis of the treatment of schizophrenia in Thailand: a simulation model comparing olanzapine, risperidone, quetiapine, ziprasidone and haloperidol. Journal of the Medical Association of Thailand 2005; 88(9): 1267-1277

PubMedID

16536115

Other publications of related interest

Kongsakon R, Roungkarnjanaset S. Olanzapine versus Haloperidol in the treatment of refractory schizophrenia: a cost-effectiveness analysis. J Psychiatr Assoc Thailand 2000;45:71-85.

Lieberman JA, Tollefson G, Tohen M, Green A. Comparative efficacy and safety of conventional antipsychotic drugs in first-episode psychosis: a randomized, double-blind trial of olanzapine versus haloperidol. Am J Psych 2003;160:1369.

Tollefson GD, Beasley CM, Tran PV, et al. Olanzapine versus haloperidol in the treatment of schizophrenia and schizoaffective and schizophreniform disorders: results of an international collaborative trial. Am J Psych 1997;154:457-65.

Indexing Status

Subject indexing assigned by NLM

MeSH

Antipsychotic Agents /classification /economics /therapeutic use; Benzodiazepines /economics /therapeutic use; Computer Simulation; Cost of Illness; Cost-Benefit Analysis; Dibenzothiazepines /economics /therapeutic use; Drug Costs; Haloperidol /economics /therapeutic use; Health Care Costs; Humans; Models, Econometric; Piperazines /economics /therapeutic use; Quetiapine Fumarate; Risperidone /economics /therapeutic use; Schizophrenia /drug therapy /economics; Thailand; Thiazoles /economics /therapeutic use; Treatment Outcome

AccessionNumber

22006000284

Date bibliographic record published

30/06/2006

Date abstract record published

30/06/2006