Cost-effectiveness analysis of budesonide aqueous nasal spray and fluticasone propionate nasal spray in the treatment of perennial allergic rhinitis


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
Budesonide aqueous nasal spray and fluticasone propionate allergic spray in the treatment of perennial allergic rhinitis (PAR).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients aged 18 years or older, with at least a one year history of PAR.

Setting
The study setting was primary care. The economic study was set in Canada and Spain.

Dates to which data relate
Effectiveness data were collected between November 1994 and July 1995. Resource use data were based on expert opinion: 5 specialists in allergy or immunology and 5 GPs. The dates of the cost data were not reported. The price year was 1998.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Part of the costing was carried out retrospectively on the same patient sample as that used in the effectiveness analysis. Part of the costing was estimated by experts based on an average patient.

Study sample
314 patients with at least a 1-year history of PAR were randomised to receive budesonide aqueous nasal spray, fluticasone propionate allergic spray or a placebo. The method of patient sample selection was not stated and no power calculations were reported. 273 of the 314 randomised patients fulfilled the study criteria as stipulated in the protocol. It is not clear why 41 patients were withdrawn from the study after randomisation. It may be that these patients fulfilled the protocol's criteria for withdrawal from the study: non-compliance with the treatment protocol, treatment required with a prohibited medication, or experience of a serious adverse event. Of the 273 patients, 111 (39%) were
randomised to the budesonide group, 109 (40%) were randomised to the fluticasone propionate group and 53 (21%) were allocated to the placebo group. The percentage of subjects invited to participate who refused was not reported. The percentage of subjects excluded from the initial sample before randomisation was 16.2% (375 recruited, 314 randomised).

**Study design**
A randomised, clinical trial carried out at multiple centres in Canada and in Spain. The study was double-blind for budesonide and placebo (the bottles being identical) and single blind (to the investigator) for fluticasone propionate. The exact number of centres was not specified. Patients were followed up for 6 weeks. Effectiveness results were extrapolated to one year. Patients were assigned to parallel treatment groups according to a computer-generated block randomisation list. For every two patients randomised to treatment with budesonide, two were randomised to treatment with fluticasone and one to treatment with placebo. 8 patients withdrew from the study: four in the budesonide group, three in the fluticasone group and one in the placebo group.

**Analysis of effectiveness**
The analysis of the clinical study was based on treatment completers. The primary health outcomes included a combined nasal symptom score, individual nasal symptom scores (blocked nose, runny nose, sneezing and eye irritation), compliance as measured by the number of inhaled doses for each patient, the weekly consumption of antihistamine tablets and a patient's overall evaluation of efficacy of the treatments. At analysis, groups were shown to be comparable in terms of age and duration of disease.

**Effectiveness results**
The reduction from baseline in combined nasal symptom scores was 2.11 for budesonide and 1.65 for fluticasone. The mean reduction in score from baseline for the placebo group was not reported. There were significantly greater reductions in both active treatment groups compared with placebo for the combined nasal symptom score (p<0.0001 and p=0.0012 respectively).

Although the economic evaluation article reported no difference between the active treatments in terms of the combined nasal symptoms, the published clinical study reported that, when comparing the two active treatment groups, a significantly greater improvement occurred in the budesonide-treated patients, (p=0.31). Note: the writer of this abstract could find no explanation for this discrepancy.

The two active treatment groups showed significantly greater reductions in all individual nasal symptoms compared with placebo. For blocked nose, a significantly greater reduction was demonstrated in the budesonide group compared with the fluticasone group.

No significant difference was found in terms of the daily mean number of inhaled doses for each patient among the three therapy groups.

Active treatment groups demonstrated significantly greater reductions in intake of antihistamine tablets compared to the placebo group. No statistically significant difference between the active treatment groups was seen in terms of antihistamine tablet intake.

A significant difference in the overall assessment of treatment by patients was found for both active treatments compared to placebo, with no difference between the active treatments.

**Clinical conclusions**
It was concluded that both treatments were superior to placebo. Although the economic study concluded that there was similarity between the two drugs in terms of compliance, clinical endpoints, and tolerability, the conclusions of the published clinical study were that once daily budesonide aqueous nasal spray was significantly better in controlling the symptoms of PAR (especially nasal blockage) than once daily fluticasone propionate. The writer of this abstractor was
unable to reconcile this apparent discrepancy.

**Measure of benefits used in the economic analysis**
The combined nasal symptom score was the measure of benefits.

**Direct costs**
Direct costs were not discounted because of the short time horizon of the study (one year). Quantities and costs were reported separately. Direct costs related to general medical management, including the initial visit and follow-up visits, allergy tests, blood analyses, other investigations, the prescription of nasal corticosteroids and any other medication and planned and unplanned follow-up visits over the following 12 months. Direct costs also included the management of lack of efficacy and side-effects including the percentage of patients with lack of efficacy or with side-effects, discontinuation and switching to different nasal corticosteroids, number of extra visits, allergy tests, blood analyses or other investigations carried out due to lack of efficacy or occurrence of side-effects. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based either on actual data or on expert opinion. Costs were based on reimbursement data. Costs for physician visits, laboratory tests and other diagnostic tests were obtained from the Schedule of Benefits. The price year was 1998.

**Statistical analysis of costs**
No statistical analysis was reported.

**Indirect Costs**
Indirect costs were not included.

**Currency**
Canadian dollars (Can$).

**Sensitivity analysis**
Sensitivity analyses were conducted on non-drug treatment costs.

**Estimated benefits used in the economic analysis**
Based on the clinical conclusions that no significant difference was seen between budesonide and fluticasone treatments, a cost-minimization analysis was performed. As noted above, these were not the clinical conclusions of the published clinical study, and consequently a cost-effectiveness analysis should have been performed.

**Cost results**
The total average costs per patient for a 12-month treatment were Can$ 389.85 with budesonide and Can$ 508.06 with fluticasone.

**Synthesis of costs and benefits**
Budesonide appeared to be a less expensive treatment than fluticasone. Consequently, the treatment of PAR was cost saving. Switching all patients from fluticasone to budesonide, saving Can$ 118.21 per patient, would give a total annual saving of over Can$ 12 million in Canada. Results were not sensitive to changes in non-drug treatment costs.

**Authors' conclusions**
Budesonide aqueous nasal spray was shown to be more cost-effective than fluticasone propionate nasal spray in the
treatment of perennial allergic rhinitis. This result is valid in the province of Ontario, Canada and in many other settings with the same structure of relative prices. The result is mainly driven by a difference in drug costs.

CRD COMMENTARY - Selection of comparators
Budesonide was compared to fluticasone for the treatment of PAR. Although the authors appropriately justified not including the placebo as a comparator in the economic analysis, there was no explicit justification in the choice of fluticasone as a comparator. You, as a user of the database, should decide if these health technologies are relevant to your own setting.

Validity of estimate of measure of benefit
The analysis was based on a randomised clinical trial, which was appropriate for the study question. The study sample was representative of the study population. Patient groups were shown to be comparable at analysis. However, there appear to have been some problems with the analysis of effectiveness. It was not clear why 41 patients were excluded from the study after randomisation and the analysis was based on treatment completers only. There is likely to be bias in the effectiveness results. Moreover, the primary outcome, the combined nasal symptom score, seems to be based on a non-validated instrument. The main difficulty in the estimate of effectiveness was the discrepancy in the clinical conclusions reported in the clinical paper (superiority of budesonide over fluticasone) and the economic evaluation (equivalence of treatments). However, as budesonide turned out to be the cheaper treatment, it would, in any event, be cost-saving in both cases.

Validity of estimate of costs
Positive features of the cost analysis were that all relevant direct cost categories were included, quantities and costs were reported separately, sensitivity analyses were reported on costs, and the price year was reported. However, since the estimation of resource use was based on a retrospective evaluation based on expert opinion, there may be bias in the results. No statistical analysis was conducted on costs. Charges were used to proxy prices.

Other issues
In general, care should be taken with the results of this study due to the apparent discrepancies between the clinical study and the economic evaluation. On other issues, the authors did make appropriate comparisons of their findings with those from other studies. The issue of generalisability to other settings was addressed. The study enrolled patients with at least a 1-year history of PAR and this was reflected in the authors’ conclusions.

Implications of the study
Budesonide aqueous nasal spray was shown to be cost saving compared to fluticasone propionate nasal spray in the treatment of perennial allergic rhinitis.

Source of funding

Bibliographic details

Other publications of related interest
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Subject indexing assigned by NLM

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