A cost-benefit analysis using a willingness-to-pay questionnaire of intranasal budesonide for seasonal allergic rhinitis

Keith P K, Haddon J, Birch S

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
Intranasal budesonide for seasonal allergic rhinitis.

Type of intervention
Treatment.

Economic study type
Cost-benefit analysis.

Study population
Patients suffering from seasonal allergic rhinitis.

Setting
Community. The study was carried out in Canada.

Dates to which data relate
Effectiveness and resource used data were collected during the 1993 ragweed pollen season. Cost data were collected from 1992-1993 sources. The price year was 1993.

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

Link between effectiveness and cost data
The costing was undertaken on the same patient sample as that used in the effectiveness study and was carried out prospectively alongside the effectiveness analysis.

Study sample
Patients received intranasal budesonide by Turbuhaler (n=121) or aqueous spray (n=121). Subjects were over 18 years of age with a positive skin prick test to ragweed less than 3mm. Subjects had symptoms of rhinitis or clear exacerbation of perennial rhinitis symptoms during at least one previous ragweed season. None had a history of asthma requiring treatment with oral or inhaled steroids or nasal polypsis. Power calculations were used to determine sample size. Assuming an alpha equal to 0.05 and a power of 80%, the minimal detectable differences per week were $Can3.69 for willingness to pay, $Can5.26 for costs, and $Can6.50 for cost-benefit. 241 out of 243 patients completed the willingness to pay questionnaire.
Study design
This study was a double-blind, randomised, multi-centre, double-dummy, parallel group, active controlled trial involving 9 Canadian centres in Manitoba, Ontario, and Quebec.

Analysis of effectiveness
The analysis of the clinical study was based on intention to treat. The primary health outcomes used were the impact of hayfever and willingness to pay for treatment. At analysis, groups were shown to be comparable in terms of age, sex, weight, height, baseline placebo days, treatment days, ragweed skin test size, and income.

Effectiveness results
79% of patients felt their symptoms had a smaller impact, 15% a similar, and 5% a greater impact, than in previous years.

Clinical conclusions
Intranasal budesonide is beneficial in the treatment of seasonal allergic rhinitis.

Modelling
No modelling was undertaken.

Measure of benefits used in the economic analysis
The measure of benefit used was willingness to pay for treatment. Patients completed a questionnaire at the beginning and end of the study. Symptom severity using a quality of life questionnaire for clinical trials in rhinoconjunctivitis was also determined for correlation analysis.

Direct costs
Direct costs were not discounted given the short time period (less than 1 year). Quantities and costs were reported separately. Direct costs covered the costs of budesonide and rescue medication used, the number of physician visits and services provided, visits to other physicians or hospital outpatient departments. The quantity/cost boundary adopted was that of society. The estimation of quantities and costs was based on actual data. Physician service utilisation was costed using Ontario Health Insurance Plan fees. The Ontario Ministry of Health best available price was used for rescue medications. The price year was 1993.

Statistical analysis of costs
A statistical analysis of costs was not reported.

Indirect Costs
Indirect costs covered the cost of time off work or school due to rhinitis symptoms. The cost of time off work was based on the industrial aggregate average hourly wage for salaried workers for the last week of August 1993.

Currency
Canadian dollars (Can$) with Can$1.00 = US$0.71.

Sensitivity analysis
One-way, two-way, and three-way sensitivity analyses were conducted on the cost of antihistamines, the cost of time lost from work, and the cost of intranasal steroids.
Estimated benefits used in the economic analysis
Willingsness to pay was Can$15.89 (range: 1 - 75) per week prior to treatment and Can$12.95 (range: 0 - 75) per week following treatment. Willingsness to pay prior to the study compared with the value following the study resulted in a reduction of Can$2.86 (range: -50 to 30) (p<0.0001). This indicated that treatment did not relieve all aspects of discomfort arising from the condition. Willingsness to pay was positively associated with quality of life improvements. The medication relieved 92% of symptoms. There was a greater percentage improvement in those who felt they had fewer symptoms compared with those who felt they were the same (p=0.03) and those who felt they were the same or greater (p=0.006). There was no correlation between willingsness to pay on the one hand and income, quality of life, change in quality of life or rescue medication use on the other hand.

Cost results
The mean cost per patient per week did not differ between Turbuhaler and aqueous spray groups. The greatest costs were incurred for days missed and rescue medication. The mean cost per patient per week was Can$5.80 for all subjects, Can$4.99 for the Turbuhaler group, and Can$6.60 for the aqueous spray group.

Synthesis of costs and benefits
The net benefit for all subjects was Can$5.80 per week, (p<0.0001). This was also seen in the Turbuhaler and aqueous spray groups individually and in those subjects who had fewer symptoms. The sensitivity analysis revealed that intranasal steroid costs had a significant impact on the cost-benefit result.

Authors' conclusions
Intranasal budesonide is cost-beneficial in the treatment of seasonal allergic rhinitis and a willingness to pay questionnaire may provide a useful method to assess a therapy's benefit.

CRD COMMENTARY - Selection of comparators
A justification was given for the alternatives used, namely currently recommended and innovative treatments, although neither was specifically identified as the comparator. You, as a user of this database, should decide if these health technologies are relevant to your setting.

Validity of estimate of measure of benefit
The validity of the benefit results is likely to be high due to the many strong points of the methods used. The analysis was based on a randomised controlled trial, which was appropriate for the study question. The study sample was representative of the study population and patient groups were shown to be comparable at analysis. Appropriate analysis was conducted to investigate the relationship between ability and willingness to pay. The estimation of benefits was obtained directly from the effectiveness analysis based on a willingness to pay questionnaire. The choice of estimate was justified.

Validity of estimate of costs
The authors adopted clear and sound methods for determining costs. All categories of cost relevant to the perspective adopted were included in the analysis. Costs and quantities were reported separately. A sensitivity analysis was conducted on prices, but not on quantities. Physician service utilisation was costed on the basis of fees. The price year was reported.

Other issues
A genuine, and well conducted, cost-benefit analysis. The authors did make appropriate comparisons of their findings with those from other studies, although the issue of generalisability to other settings was not specifically addressed. The authors did not present their results selectively. The study enrolled patients suffering from seasonal allergic rhinitis and...
this was reflected in the authors' conclusions. Some subjects may have underestimated their willingness to pay, given that many services in Canada are provided without cost. Subjects who felt the therapy worsened their symptoms were not able to express this except by giving a negative dollar amount.

**Implications of the study**
Intranasal budesonide is cost-beneficial in the patient domain studies. A willingness to pay questionnaire may provide a useful method to assess a therapy's benefit.

**Source of funding**
None stated.

**Bibliographic details**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Administration, Intranasal; Adult; Anti-Inflammatory Agents /administration & dosage; Budesonide /administration & dosage; Cost-Benefit Analysis; Double-Blind Method; Female; Health Care Costs; Humans; Male; Middle Aged; Rhinitis, Allergic, Seasonal /drug therapy

**AccessionNumber**
22000000418

**Date bibliographic record published**
31/01/2001

**Date abstract record published**
31/01/2001