Cost-effectiveness of salmeterol xinafoate/fluticasone propionate combination inhaler in chronic asthma

Doull I, Price D, Thomas M, Hawkins N, Stamuli E, Tabberer M, Gosden T, Rudge H

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.

CRD summary
The aim was to examine the cost-effectiveness of the salmeterol xinafoate and fluticasone propionate combination inhaler (SFC) compared with inhaled corticosteroids (ICS) for the treatment of chronic asthma in adults and children. The SFC was generally cost-effective in those with uncontrolled asthma on ICS, in those who required ICS and a long acting beta-two agonist, and in adults who required combination therapy. The analysis was based on sound methodology with good reporting of the methods and findings. The authors’ conclusions are likely to be valid.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to examine the cost-effectiveness of a salmeterol xinafoate and fluticasone propionate combination inhaler (SFC) in comparison with other inhaled corticosteroids (ICS) for the treatment of chronic asthma in two patient populations, namely adults plus adolescents (aged 12 years and over) and children (aged 4 years to 11 years).

Interventions
The SFC strategy was compared with ICS with or without a long acting beta-two agonist (LABA).

The ICS strategies were: increasing the dose of fluticasone propionate (FP) in patients who failed to achieve asthma control at their current dose; beclometasone dipropionate (BDP) plus salmeterol inhaler or FP plus salmeterol in patients requiring a LABA; and a budesonide and formoterol combination inhaler (BUD/FORM) in those requiring a combination inhaler.

Two SFC devices were considered, the Accuhaler and the Evohaler.

Location/setting
UK/secondary care.

Methods
Analytical approach:
This economic evaluation was based on a simple decision model with two asthma control health states (symptom-free and with symptom). The time horizon of the analysis was one year. The authors did not explicitly state the perspective adopted.

Effectiveness data:
The clinical data were derived from a systematic review of randomised controlled trials (RCTs). The endpoints were pooled by means of a meta-analysis which produced both random and fixed treatment effect estimates. The details of the search methods and results as well as the inclusion and exclusion criteria were extensively reported. All the studies selected (14 RCTs) included a head-to-head comparison of at least two of the strategies compared. Some assumptions were also made.

Monetary benefit and utility valuations:
The utility estimates were derived from a stratified, double blind, parallel-group RCT called the Gaining Optimal Asthma control (GOAL) study, which enrolled 3,416 patients with uncontrolled asthma. A mapping algorithm was used to calculate the utility scores using the EuroQol at five dimensions (EQ-5D) questionnaire and the results of the asthma quality of life questionnaire for patients in the GOAL study.

Measure of benefit:
Quality-adjusted life-years (QALYs) were used as the summary benefit measure.

Cost data:
The categories of costs were drugs (including inhalers) and the health services associated with secondary care visits, primary care visits, and rescue medications. The unit costs for drugs were obtained from the online Drug Tariff or other licensed providers. Reasonable resource use for drugs was assumed. All resource use data for other health care services were derived from the GOAL trial using a statistical approach (linear regression analyses). These items were valued using published sources for England and Wales. All costs were in UK pounds sterling (£) and the price year was 2006.

Analysis of uncertainty:
The issue of uncertainty was addressed by means of a probabilistic Monte Carlo simulation, which attributed stochastic distributions to model inputs, except for treatment costs, which were regarded as fixed.

Results
In adults, compared with an increased dose of FP, the SFC was the dominant strategy (both more effective and less expensive) using the Evohaler and SFC was associated with an incremental cost per QALY gained of £6,852 using the Accuhaler.

In comparison with separate FP and salmeterol, the SFC was generally cheaper, but the small difference in effectiveness made the cost-utility ratios very unstable, ranging from dominance to high figures.

In comparison with BUD/FORM, the SFC was dominant, but again small differences in the clinical data made the findings unstable.

In children, the incremental cost per QALY gained with the SFC over an increased dose of FP was well below the commonly used threshold of £30,000 per QALY when using the Evohaler, but well above this threshold when using the Accuhaler. When compared with its components delivered in separate inhalers, the SFC was the dominant strategy.

In general, the analysis demonstrated the cost-effectiveness of the SFC in most of the scenarios considered.

Authors' conclusions
The authors concluded that the SFC was generally cost-effective in adults and children with asthma which was uncontrolled on ICS, in those who required ICS plus a LABA, and in adults who required combination therapy.

CRD commentary
Interventions:
The selection of the comparators appears to have been appropriate in that all the available treatments for adults and children with asthma were considered. Different combinations of treatments were compared on the basis of the patients’ needs.

Effectiveness/benefits:
The authors provided an extensive description of the methods and conduct of the literature review. The key characteristics of the primary studies (drug dosages, follow-up, design, and sample size, etc.) were reported. The inclusion of RCTs ensured the validity of these clinical data. Furthermore, a validated approach was used to pool the individual estimates and the primary studies were homogeneous. All these characteristics enhance the validity of the clinical data. The derivation of the utility valuations used to calculate the QALYs was described. QALYs are a validated measure, and are appropriate for a chronic disease such as asthma, which impacts heavily on the patients’ quality of life.

They have the further advantage of allowing cross-disease comparisons.
Costs:
The perspective was not explicitly stated, but appears to have been that of the national health service. The methodology used to derive costs was extensively described. The details of unit costs and some information on quantities of resources were provided. The price year was reported and discounting was not relevant given the one-year horizon of the analysis. In general, the economic analysis appears to have been carried out transparently.

Analysis and results:
The costs and benefits were appropriately synthesised in an incremental analysis. The issue of uncertainty was satisfactorily addressed. The results of the sensitivity analysis were not extensively presented, but the authors stated that more findings were available in an online appendix. The authors noted that the main weakness of their analysis was that, for a few comparisons, there was a lack of available data on the treatment efficacy, especially for the paediatric population. This meant the cost-effectiveness comparison was not robust.

Concluding remarks:
Overall, the analysis was based on a solid methodology with good reporting of the methods and findings. The authors' conclusions are likely to be valid.

Funding
Funding received from GlaxoSmithKline.

Bibliographic details

PubMedID
17519082

DOI
10.1185/030079907X187982

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Administration, Inhalation; Adolescent; Adult; Albuterol /administration & dosage /analogs & derivatives /economics; Androstadienes /administration & dosage /economics; Anti-Asthmatic Agents /administration & dosage /economics; Asthma /drug therapy /economics; Child; Chronic Disease; Cost-Benefit Analysis; Drug Combinations; Fluticasone Propionate, Salmeterol Xinafoate Drug Combination; Health Services /economics; Hospitals, State /economics; Humans; Models, Econometric; Nebulizers and Vaporizers /economics

AccessionNumber
22007001486