Short Report

Salmeterol xinafoate: an analysis of outcomes and cost-effectiveness using a primary care database

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Introduction

Long-acting inhaled β₂-agonists (LABs), used in conjunction with low-dose inhaled steroids, are a recommended alternative to high-dose inhaled steroids for asthmatics with persistent symptoms (1). There are, however, few published data regarding their cost-effectiveness. The drugs are relatively expensive and the aim of this study was to evaluate LAB cost-effectiveness in primary care, in terms of improved clinical outcomes (associated with reduced NHS costs) offsetting higher prescription costs. A controlled, retrospective, non-randomized analysis utilized the computerized Thorpewood Primary Care Database and compared clinical outcomes and asthma management costs 1 yr prior to and 1 yr after initiation of therapy with salmeterol xinafoate.

Patients and Methods

Inclusion criteria for study group
- Regularly monitored, confirmed diagnosis of asthma
- Inhaled steroid therapy for at least 2 yrs prior to addition of salmeterol
- No concomitant increase in inhaled steroid dosage with salmeterol therapy
- Minimum of 1 yr salmeterol therapy

Inclusion criteria for control group
As above except that patients had been prescribed salmeterol for less than 1 yr at the study date. The study group (n=23) were followed for consecutive years, immediately prior to (Year 1) and 1 yr into (Year 2) salmeterol therapy. A second group of patients (n=14) who were prescribed salmeterol subsequent to the period of study were followed for the 2 yrs immediately preceding. At the end of Year 2 their asthma status was likely to be similar to that of study group patients at the end of Year 1. This group was included as a control for non-drug effects (e.g. changes in practice staff or clinical procedures) which can influence clinical outcomes and/or costs. Whilst not directly comparable in terms of asthma severity, given the retrospective nature of the study, this second group of patients was considered the most apposite comparison with the salmeterol treatment group (2). Baseline demographic and clinical parameters were noted and the following clinical and economic endpoints determined:
- peak expiratory flow (PEF);
- drug requirements: inhaled steroids, short-acting rescue β₂-agonists, courses of oral prednisolone, courses of antibiotics;
- number/type general practice consultations: surgery (GP/nurse) and home visits (day/night);
- hospital attendance: out-patient/admissions.

Analysis

Analyses were based on Year 1:Year 2 differences calculated for each endpoint and within each patient. The Wilcoxon matched-pairs signed-rank test was used. All tests were two-sided. Comparisons were not made between groups as patients were not randomized and demographic details and asthma severity were not matched.

Healthcare resource utilization and prescriptions were costed and mean total management costs (i.e. medication + other healthcare contacts – including GP and nurse visits, hospital referrals and admissions) calculated per patient, as well as the percentage difference between Year 1 and Year 2 costs. These were then compared descriptively. Sources for unit costs were generally based on practice/local authority estimates for 1994.

Results

BASELINE COMPARISONS

The two groups were broadly similar in terms of asthma duration, smoking habits and reasons for initiating/ subsequently initiating salmeterol therapy. However, asthma severity and demographics were not matched. The mean age of the salmeterol group was 38 years, that of
the controls, 24 years. Gender mix (%M:F) was 50:50 (salmeterol) and 72:28 (controls). Median dosage of inhaled corticosteroid (BDP or equivalent) was 1600 μg day⁻¹ (salmeterol) and 450 μg day⁻¹ (controls).

OUTCOMES – YEAR 1:YEAR 2 COMPARISONS
Changes in PEF, rescue β₂-agonist use, frequency of consultations, and asthma management costs are illustrated in Fig. 1. In addition:

- median inhaled corticosteroid dosage fell by 400 μg in the salmeterol group (P=0.0001), and increased by 600 μg in the control group (P=0.002);
- the median number of short courses of oral steroids prescribed fell from one to zero for the salmeterol group (P=0.005) and remained at zero for the controls (P=1.00). The proportion of study group patients having zero courses doubled, from 39 to 78%;
- the number of courses of antibiotics prescribed did not change significantly for either group (P=1.00);
average total management costs per patient per annum increased by +2.9% (£15.98) for the salmeterol group [Fig. 1(d)]. The control group was cheaper to manage throughout, but costs increased by 51% (£123.86).

The small number of GP home visits, hospital referrals and admissions precluded statistical comparison, although costs associated with these contacts were captured in the total asthma management cost calculations.

Discussion

The addition of salmeterol therapy was associated with significantly enhanced asthma control in terms of the following endpoints:

- Lung function improved;
- Inhaled steroid requirement was reduced;
- Rescue medication use decreased;
- Exacerbations diminished (as evidenced by fewer courses of oral prednisolone);
- GP/nurse surgery consultations were reduced.

The effects of salmeterol therapy on the various clinical outcomes investigated are generally in agreement with those observed in larger, prospective studies: reduced inhaled steroid requirement (3), improved lung function (3–5) and symptom control (3,4) and a diminution in the frequency of exacerbations (5) have all been documented. What is harder to interpret from the results of this limited, retrospective study is whether the improvements in clinical outcomes observed are directly due to salmeterol therapy. It is, however, notable that many studies have confirmed that the dose–response curve for inhaled steroids may be very flat and that increasing the dose of inhaled steroid may not be associated with marked clinical improvement (6). This would help to explain why the large increase in management costs of the control group failed to ‘buy’ the clinical benefits associated with salmeterol therapy. GPs and nurses were trying to gain control of patients’ asthma (in terms of symptoms and quality of life) but were failing to do so, hence the increase in general practice consultations for controls in Year 2. Another possible reason for improvement in the salmeterol group might be that patients were more compliant with their new combined therapy, however, compliance effects are likely to be transient and no change in repeat prescriptions (a measure of compliance) was noted.

The increase in average total costs per patient for salmeterol therapy was minimal (+2.9%, £15.98). Medication costs increased, but were almost completely offset—primarily by large savings in consultations. Moreover, this minimal increase in outlay resulted in significant patient benefits. By contrast, increased average total spend per patient in the control group (+51%, £123.86) bought no such improvements and reflected more frequent surgery visits and increased prescribing costs. The reduction in consultations associated with salmeterol treatment is particularly significant when set against a trend towards increased consulting – for asthma in particular (7).

Our results indicate that the introduction of salmeterol therapy into general practice has been cost-effective – with a minimal increase in expenditure buying significant patient benefits and reducing GP/nurse consultations. Notwithstanding the design limitations of this study, the results strongly suggest that a switch to salmeterol therapy is cost-effective for the primary care management of asthmatics who, despite being prescribed increasing doses of inhaled steroids, have persistent problems.

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References