

An Analysis of the Utilisation and Expenditure of Medicines Dispensed for the Management of Severe Asthma

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Abstract

There are approximately 6,300 people in Ireland with a diagnosis of Chronic Obstructive Pulmonary Disease (COPD) and with a fast growing elderly population the incidence of COPD is likely to increase. This study examines the prescribing patterns of medicines dispensed for the management Asthma/COPD in patients over the age of 35 years using the HSE - Primary Care Reimbursement Services (PCRS) prescribing databases. The HSE's PCRS pharmacy claims data, which covers all those over 70 years of age and means tested for those less than 70 years, was analysed for the years 2005/ 2006. Approximately 26,548 (17.9%) of patients who were prescribed a respiratory drug received inhaled short-acting beta₂ agonists in combination with a regular standard-dose inhaled corticosteroid. A further 5,044 (3.4%) were also prescribed a regular inhaled long-acting beta₂ agonist (salmeterol or formoterol). A total of 2506 patients (6.2%) on combination therapy were co-prescribed four different anti-asthmatic treatments inclusive of oral prednisolone. A small proportion of the patients prescribed a respiratory drug were co-prescribed nicotine replacement therapy (n=5177, 3.5%). In total there were 9,728 (6.2%) patients prescribed a mucolytic drug in combination with a respiratory drug and the rate of co-prescribing with antibiotics was 22%. COPD is a debilitating disease that is primarily caused by smoking and is therefore largely preventable. The HSE's PCRS pharmacy claims data is a valuable tool for helping to assess the burden of this disease in the Irish context.

Introduction

Ireland has the fourth highest prevalence of asthma in the world with an estimated population of 470,000 with a diagnosis of the disease. Approximately 25,000 accident and emergency visits per year and approximately 6,000 to 7,000 hospital admissions are asthma related. The total number of prescriptions for the management of asthma/COPD has increased from 2,602,580 to 3,092,827 on the Community Drug schemes between 2002 to 2006 with an associated increase in expenditure from 58,806,067 to 92,875,383. Approximately 6,300 of those with asthma have a diagnosis of Chronic Obstructive Pulmonary Disease (COPD). COPD is a major cause of morbidity and mortality and consequently has a substantial financial impact on the healthcare service. Tobacco smoking is the main etiological factor for the disease so therefore it is largely preventable. The aims of this study were to determine the prescribing patterns and expenditure of medicines dispensed for the management of severe asthma/COPD in patients over the age of 35 years.

Methods

The HSE-Primary Care Reimbursement Services (HSE-PCRS; formerly General Medical Services (GMS) Payments Board) scheme provides free healthcare to approximately 30% of the Irish population (approximately 1.2 million). Eligibility for the scheme is means tested for those under 70 years of age, and is confined to persons who are unable without undue hardship to arrange general practitioner services for themselves and their dependants. Patients registered under this scheme are dispensed all medicines free of charge. Since July 2001, the service has been made available to all those over 70 years of age. While the HSE-PCRS population cannot be considered representative of the entire population, as the elderly, the young and the socially disadvantaged are over-represented, it is estimated to account for approximately 70% of all medicines dispensed in primary care. The HSE-PCRS pharmacy database contains demographic details on the patients (age and gender), information related to the medicine dispensed such as the non-proprietary drug name along with the proprietary drug name, the strength and the quantity of the drug dispensed together with the associated cost and dispensing fee. However, there are no diagnostic data available. All prescription items are coded using the WHO Anatomical Chemical (ATC) classification system. National prescription files were analysed for the years 2005/ 2006 to identify all prescription items relating to medicines dispensed for the management of asthma/COPD (ATC code R03) in patients over the age of 35 years.

The evidence shows that patients who continue to have asthma related symptoms over the age of 35 years are more likely to have COPD as an irreversible component of the disease comes into play. The prescribing patterns for patients on these medications were examined which included: a) the utilisation and expenditure of the different drug groups prescribed for the management of respiratory disease, b) the different combinations of therapy prescribed in the management of asthma/COPD, c) the number of patients who were co-prescribed drugs which have the potential to interact during a 12 month period and d) the number of patients on combination therapy who were co-prescribed antibiotics. The British National Formulary (BNF) March 2006 edition and Stockley's Drug Interactions seventh edition were used to identify all drugs that could potentially interact with drugs prescribed for the management of Asthma/COPD. All prescriptions for drugs prescribed for the management of Asthma/COPD were identified for all healthboard regions between January 2006 and December 2006 and analysed to identify the frequency of co-prescribing of potentially interactive drugs. Each drug class was analysed separately. Included in the analysis were all items on the same prescription claim over the 12 month period January 2006 to December 2006. SAS statistical software (v 9.0) was used for analysis and descriptive data presented.

Results

There were 148,037 patients over the age of 35 years prescribed a respiratory drug on the HSE-PCRS scheme in 2006. This accounts for 19.8% of the GMS eligible population in the over 35 year age group. The total HSE-PCRS expenditure (ingredient cost plus VAT) on respiratory drugs amounted to 62,365,956 in this age group. The adrenergics and other drugs for Asthma/COPD (ATC code R03AK) such as salbutamol and salmeterol accounted for 50% of this expenditure. The glucocorticoids (ATC R03BA) such as beclometasone and budesonide accounted for a further 20% and the anticholinergics tiotropium bromide and ipratropium bromide and the selective beta-2-adrenoreceptor agonists accounted for a further 13% and 10% respectively. Approximately 26,548 (17.9%) of these patients received inhaled short-acting 2 agonists in combination with a regular standard-dose inhaled corticosteroid as shown in Table 1.

A further 5,044 (3.4%) patients were prescribed an inhaled short-acting beta₂ agonist in combination with a regular standard-dose inhaled corticosteroid along with a regular inhaled long-acting beta₂ agonist (salmeterol or formoterol) for the management of Asthma/COPD. 2506 patients (6.2%) on combination therapy were co-prescribed four different asthmatic treatments inclusive of oral prednisolone. Approximately 5177 (3.5%) of the patients prescribed a respiratory drug were co-prescribed nicotine replacement therapy. The majority of these patients (70%) were prescribed either the nicotine or niquitin patches. In total there were 9,728 (6.2%) patients prescribed a mucolytic drug in combination with a respiratory drug b) There were significant levels of co-prescribing of salbutamol with beta blocking agents at 15.2% (95%CI: 15, 15.4). In addition 12.8% (95%CI: 12.4, 13.0) of the patients prescribed theophylline in 2006 were also prescribed ciprofloxacin c) Levels of co-prescribing with antibiotics was 22%. The antibiotics co-prescribed were augmentin, clarithromycin, cephalosporins and ciprofloxacin. The various combinations of Drug treatments prescribed for the management of Asthma/COPD along with antibiotics by individual age groups are shown in Table 2.

Discussion

The study found that in 2006 approximately 148,037 patients over the age of 35 yrs were prescribed a respiratory drug for the management of Asthma/COPD on the HSE-PCRS scheme with an associated total expenditure (Ingredient cost plus VAT) of 62,365,956. The overall number of prescriptions for Asthma/COPD in all age groups

has increased by 22.2% between 2002 and 2006. Worldwide the elderly population represent the fastest growing age-group and the incidence of COPD is likely to increase with continued ageing of the population. The data from the World Health Organisation shows that death rates from diseases of the respiratory system in Ireland are almost double the EU average. There were over 6,000 deaths in Ireland in 2004 due to respiratory disease of which 1,320 (22%) were attributable to COPD. The results from this study identified that approximately 70% of the patients over the age of 35 yrs on combination therapy for the management of asthma/COPD were aged 70 years or older.

There are many sets of recommended guidelines published on the appropriate management of patients with a diagnosis of COPD including recommendations on different pharmacological combinations of treatment pending the stage and severity of the disease. Based on such guidelines in particular from the British Thoracic Society⁴ and the UK's National Institute of Clinical Excellence (NICE)⁵ it would appear that the results of our analyses would indicate that the prescribing practices for patients with severe asthma/COPD are in accordance with such guidelines.

Published studies show that respiratory infection may be responsible for 50-70% of exacerbations of COPD. Antibiotic therapy is aimed at treating the most common pathogens, such as *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis*. Mild to moderate exacerbations of COPD are usually treated with the older broad-spectrum antibiotics such as doxycycline, trimethoprim-sulfamethoxazole and amoxicillin-clavulanate potassium. Treatment with augmented penicillins, fluoroquinolones, third-generation cephalosporins or aminoglycosides may be considered in patients with more severe exacerbations. The results of this study showed that 22% of the patients on combination therapy for Asthma/COPD were co-prescribed an antibiotic during the study period. The most commonly prescribed antibiotics were augmentin, clarithromycin the cephalosporins ciprofloxacin and erythromycin.

It was identified from this study that of the 148,037 patients over the age of 35yrs prescribed a respiratory drug on the HSE-PCRS scheme in 2006, and 5177 (3.5%) were co-prescribed NRT at some stage during the study period. The majority of the patients (74.8%) prescribed NRT were between the ages of 35 years and 55 years with peak prescribing in the 45-55 age group. More than 80% of COPD patients are or were smokers. The extent of the COPD depends on how long and how much tobacco was used. Although quitting smoking reduces the risks of developing COPD, some of the damage caused by smoking is irreversible.

Ciprofloxacin has been shown to interact adversely with theophylline⁸⁻¹⁰ and such drug interactions can result in seizures, circulatory failure and respiratory failure which can be fatal. It was identified from this study that 12.8% of the patients who were prescribed theophylline had a co-prescription for ciprofloxacin at some stage during the study period. Beta blockers are contraindicated in patients with asthma but the use of beta blockers chronically has not been evaluated. It is unclear whether under certain circumstances the long-term use of certain beta blockers may be beneficial in the management of COPD. It was identified from this study that 15.2% of the patients on salbutamol were co-prescribed beta-blocking agents. There were 50,573 patients discharged from Irish hospitals in 2004 with a primary diagnosis of respiratory disease of which 8,403 (18%) had a primary diagnosis of COPD. The average length of stay ranged between 7 and 12 days pending on severity of illness. The DRG Casemix cost for COPD with complications in 2005 was €4,932 and without complication was €2,979. The total hospitalisation costs of patients with this disease were between €16,491,744 and €19,787,184. In a separate study carried out by Tynan et al¹³ to estimate the economic burden of COPD to the Irish healthcare system it was identified that the average total cost of illness associated with a COPD patient is in the region of €5,398 per annum. This total cost increased with severity of symptoms rising to €10,835 for the most acutely ill patient. The HSE-PCRS database is not linked to diagnosis therefore it was not possible to clearly separate COPD patients from those with a diagnosis of asthma.

There is a substantial financial and social burden associated with COPD and with a fast growing elderly population this burden is set to increase. Consequently a further increase in the utilisation and expenditure on medicines for the management of COPD is to be expected. Therefore, there is a need to raise awareness of the current prescribing practices in order to help identify the full burden of the disease, maximise management in primary care and hence improve the quality of life of these patients which will help to reduce costly hospital admissions in the long term. It is a disease that is primarily caused by smoking and therefore it is largely preventable.

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Comments:
