Prescribing for patients with asthma by general practitioners in England and Wales 1994–96

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The objective of this study was to examine trends in the management of asthma in general practice, and in particular, to examine trends in the use of inhaled steroids and inhaled bronchodilators between 1994 and 1996. The data for the study came from 288 general practices, total list size 2.1 million, about 4 per cent of the population in England and Wales, on the General Practice Research Database. Between 1994 and 1996, the percentage of asthmatics being prescribed inhaled steroids, either alone or in combination with bronchodilators, increased in all age groups. The largest increase in the use of combination treatment was seen in children under five years of age. The use of bronchodilators alone in patients with asthma fell in all age groups but particularly in children. The results suggest that the management of asthma in primary care is changing, with an increase in the percentage of asthmatics who are being prescribed combination treatment with bronchodilators and either inhaled steroids or inhaled cromoglycate.

Introduction

Asthma remains an important cause of ill health. During the 1980s, both hospital admission rates and the number of deaths from asthma increased substantially. Admission rates for asthma increased from 1.1 to 1.6 per 1,000 between 1981 and 1985, an average annual increase of nearly 10 per cent. The rate of increase then slowed but there was still a further 1.7 per cent annual increase in admission rates during the second half of the 1980s. The annual number of deaths from asthma increased by 477 between 1980 and 1989, from 1,480 to 1,957.[1,2] Consultation rates for asthma with general practitioners increased nearly fivefold between 1976 and 1994.[3] These increases in morbidity and mortality occurred at a time when several effective treatments for asthma were available and when new delivery systems for anti-asthma medication were being introduced. Despite the availability of effective treatments, previous surveys have shown that many patients with asthma suffer from exacerbations of their condition, even in practices that take a special interest in asthma care.[4] Many patients and doctors were over-reliant on bronchodilator medication (used to treat the symptoms of asthma) and were reluctant to use prophylactic medication such as inhaled steroids or inhaled cromoglycate (used to prevent attacks of asthma from occurring).

Concerns about the growing morbidity from asthma led to the publication in 1990 of British Thoracic Society guidelines for the management of chronic asthma.[5] These guidelines, which were revised in 1993 and 1997,[6,7] emphasised the importance of using prophylactic medication such as inhaled steroids and cromoglycate in addition to inhaled bronchodilators to help reduce the morbidity caused by asthma. The impact of these guidelines on prescribing for asthma in general practice is difficult to assess because routine general practice prescribing data, derived from the Prescribing Analysis and Cost

(PACT) system, are only available at general practice level.[8] The data that are available show that there has been a substantial increase in the use of bronchodilators and inhaled steroids by general practitioners since the early 1980s.[1] However, PACT data cannot be used to examine the use of these drugs in different age groups. Furthermore, because many prescriptions for respiratory drugs are for chronic airways disease, routine prescribing data also cannot be used to examine trends in the management of asthma as it is not possible to separate prescribing for asthma from prescribing for chronic respiratory disorders.

The objective of this study was to examine trends in the management of asthma in general practice, and in particular, to examine trends in the use of inhaled steroids and inhaled bronchodilators between 1994 and 1996, using data from the General Practice Research Database.

Methods

The data for this study came from 288 general practices, total list size 2.1 million, in England and Wales contributing data to the United Kingdom General Practice Research Database. The General Practice Research Database (GPRD) was originally set up in 1987 by a commercial company, VAMP Ltd (now Reuters Health Information Ltd). It is currently owned by the Department of Health and has been managed by the Office for National Statistics (formerly the Office of Population Censuses and Surveys) since 1994. General practices participating in the GPRD follow agreed guidelines for the recording of clinical and prescribing data, and submit anonymised patient-based clinical records to the database at regular intervals. Consequently, the database contains longitudinal information on diagnoses, prescriptions and hospital referrals. The availability of these data offer opportunities for research on drug safety, the use of health services, and the epidemiology and natural history of many diseases.[9]

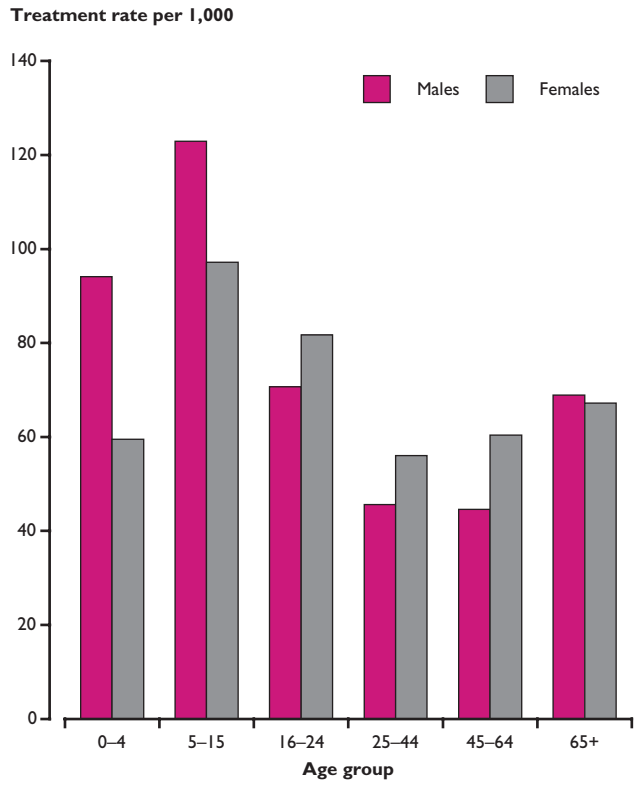
The accuracy and comprehensiveness of the data recorded in the GPRD has been documented previously.[10] All of the 288 practices included in this analysis contributed data throughout the period 1994–96 and passed regular quality checks. The combined population of the practices had a very similar age-sex composition to the population of England and Wales.[11,12]

For the most recent years for which prescribing data were available (1994–96), we identified all patients with a diagnosis of asthma who were being prescribed anti-asthmatic medication. These data were used to calculate the number of people currently receiving treatment for asthma per 1,000 population. We also calculated the percentage of patients being treated for asthma who were being treated with bronchodilators alone, inhaled corticosteroids or inhaled cromoglycate alone, or with both bronchodilators and prophylactic medication. Finally, we calculated prescribing rates for each of the 288 practices and examined the association between the prevalence of asthma and the use of combination treatment (defined as treatment with beta-2 agonists in combination with either inhaled steroids or inhaled cromoglycate).

Results

In 1996, 6.6 per cent of males and 6.8 per cent of females were receiving treatment for asthma. Treatment rates were highest in boys aged 5–15 years (123 per 1,000), followed by girls aged 5–15 years and then boys aged 0–4 years. Among adults, treatment rates were highest in people aged 65 years and over. Among children, substantially more boys than girls were being treated for asthma. Among people aged 16–64 years, this pattern was reversed with a higher proportion of women than men receiving treatment. Among the elderly, treatment rates were similar in men and women (Figure 1). A greater percentage of the patients registered with the practices were receiving treatment for

Figure 1 Treatment for asthma by age group and sex: rates per 1,000 in England and Wales, 1996



asthma in 1996 than in 1994 (6.6 per cent versus 6.3 per cent in males and 6.8 per cent versus 6.3 per cent in females). This increase was almost entirely confined to adults; treatment rates in children showed little change between 1994 and 1996.

Between 1994 and 1996, the percentage of patients being treated for asthma who were prescribed bronchodilators in combination with either inhaled steroids or inhaled cromoglycate increased from 62 per cent to 65 per cent in males and from 64 per cent to 67 per cent in females. Most of the remaining patients were prescribed bronchodilators alone with less than 10 per cent of patients being prescribed prophylactic medication only (inhaled steroids or cromoglycate). This increase in the use of combination treatment was greatest in children under five years of age (58 per cent of boys treated with combination treatment in 1996 compared with 47 per cent in 1994 and 55 per cent of girls treated with combination treatment in 1996 compared with 44 per cent in 1994). However, despite this increase in young children, the use of combination treatment with bronchodilators and either inhaled steroids or cromoglycate in patients with a diagnosis of asthma remained highest in the elderly (Table 1). The use of bronchodilators alone in patients with asthma fell in all age groups, and particularly in children, but even in 1996, 28 per cent of males and 26 per cent of females receiving treatment for asthma were prescribed bronchodilators alone.

Inter-practice variation

The number of people undergoing treatment for asthma in 288 general practices in this study varied from 19 to 135 per 1,000 (Table 2). The percentage of patients with asthma being treated with bronchodilators alone varied from 5 per cent to 60 per cent and the percentage on inhaled corticosteroids alone varied from 0 per cent to 15 per cent. The percentage on inhaled steroids, either used alone or in combination with a bronchodilator, varied from 39 per cent to 95 per cent. The percentage on inhaled cromoglycate alone varied from 0 per cent to 5 per cent;

Table 1 **Percentage of patients prescribed treatment for asthma in 1994 and 1996 who were on combination treatment or who were prescribed bronchodilators, inhaled corticosteroids or inhaled cromoglycate alone**

Males	Combination treatment (%)		Bronchodilators alone (%)		Corticosteroids alone (%)		Cromoglycate alone (%)	
	1994	1996	1994	1996	1994	1996	1994	1996
Age group								
0–4	46.8	57.8	50.1	37.0	2.1	4.4	0.8	0.6
5–15	62.3	63.8	30.4	28.5	5.1	6.3	1.9	1.2
16–24	53.0	56.6	42.5	38.6	3.7	4.2	0.8	0.5
25–44	56.8	59.0	36.1	33.9	5.8	6.5	1.2	0.6
45–64	70.7	71.8	20.9	19.7	7.4	7.8	0.8	0.6
65+	75.5	77.3	17.9	15.9	6.2	6.6	0.2	0.2
All ages	61.8	64.7	31.5	28.3	5.3	6.2	1.1	0.7

Females	Combination treatment (%)		Bronchodilators alone (%)		Corticosteroids alone (%)		Cromoglycate alone (%)	
	1994	1996	1994	1996	1994	1996	1994	1996
Age group								
0–4	44.3	54.9	52.2	39.6	1.9	4.6	1.4	0.6
5–15	60.4	63.2	33.0	29.5	4.6	5.8	1.8	1.3
16–24	58.8	60.0	35.7	34.7	5.0	5.0	0.4	0.3
25–44	62.4	64.1	30.3	28.7	6.9	6.9	0.4	0.2
45–64	71.6	73.0	19.7	17.9	8.0	8.6	0.5	0.4
65+	72.8	75.2	20.4	17.1	6.4	7.4	0.3	0.3
All ages	64.2	66.9	28.9	25.7	6.0	6.8	0.7	0.5

Table 2 **Inter-practice variation in prevalence of asthma and in percentage of patients receiving treatment for asthma who were on combination treatment or who were prescribed bronchodilators, inhaled corticosteroids or inhaled cromoglycate alone**

	Mean (standard deviation)	Range
Prevalence per 1,000	66.0 (16.3)	19.1 to 134.9
Combination treatment (%)	65.7 (6.4)	37.5 to 95.1
Bronchodilators alone (%)	27.2 (6.8)	4.6 to 59.8
Inhaled corticosteroids alone (%)	6.4 (3.0)	0.0 to 15.3
Steroids alone or in combination (%)	72.0 (6.9)	39.3 to 95.1
Cromoglycate alone (%)	0.7 (0.8)	0.0 to 4.9

20 per cent of the 288 practices prescribed no cromoglycate and a further 60 per cent prescribed cromoglycate for less than 1 per cent of their patients with asthma. The use of combination treatment with bronchodilators and either inhaled steroids or cromoglycate varied from 38 per cent to 95 per cent. There was a weak positive association between the prevalence of asthma and the use of combination treatment (correlation coefficient 0.21, 95 per cent confidence intervals 0.10 to 0.32). Hence, although practices with a higher prevalence of asthma tended to use more combination treatment, this association was not very strong, and explained only about 4 per cent of the variation in the use of combination treatment.

Discussion

This study is among the largest to examine the management of asthma in primary care. We found that the management of asthma in primary care is changing, with an increase between 1994 and 1996 in the percentage of asthmatics who are being prescribed combination treatment of bronchodilators and either inhaled steroids or inhaled cromoglycate. The use of inhaled corticosteroids alone also increased during the same period. Hence, it appears that general practitioners are changing their management of asthma to reflect the recommendations of the British Thoracic Society guidelines published in 1990 and revised in 1993. The introduction of these guidelines has coincided with a fall in death rates from asthma and a stabilisation in admission rates. Whether these changes are due in part to improved management of asthma in primary care (in particular, to greater use of inhaled steroids) is a question that cannot be answered by this study.

The use of cromoglycate fell between 1994 and 1996, continuing a long-term decline in the use of this agent.[13] Most practices now make little use of cromoglycate and now mainly use inhaled steroids for the prophylaxis of asthma. We found only a very weak association between the prevalence of asthma and the use of combination treatment. This implies that practices in which a high proportion of patients are being treated for asthma are not very much more likely to use combination treatment. Hence, the management of asthma appears to be one area of medical treatment where a higher number of patients being treated does not necessarily seem to result in a major improvement in prescribing.

A major problem with studies of the epidemiology and management of asthma is the absence of an agreed case definition. This leads to problems comparing the results of different studies.[14] In previous epidemiological studies, three different methods have generally been used to diagnose asthma: a doctor's diagnosis; the presence of symptoms of asthma; and the presence of bronchial hyper-reactivity. In this study, we defined asthmatic patients as those who had received a diagnosis of asthma from a doctor and who had in the previous 12 months been prescribed medication for the treatment of asthma. The main problem with using a doctor's diagnosis to define asthma is that

there is great variation between doctors in their propensity to diagnose asthma. The additional condition that the patients had to be on medication for the treatment of asthma to be classified as asthmatic was added to try to reduce the extent of this variation by ensuring only patients being actively treated were included in the study. Another disadvantage of using a medical diagnosis to define asthma is that some asthmatic patients will not have had their asthma diagnosed by a doctor. Hence, studies such as this which rely on a doctor's diagnosis, will include some patients who do not have asthma and exclude other patients who do have asthma. Finally, most previous studies of the epidemiology of asthma have focused almost entirely on children, hence it is really only possible to compare the results for children in this study with the results of previous studies. The prevalence of childhood asthma in this study was in line with those in an epidemiological overview of asthma published in 1994,[16] providing some validation of our results.

We were unable to investigate other aspects of asthma morbidity such as acute asthma attacks, attendance at accident and emergency departments, and referral to hospital outpatient departments.[17,18] Investigating the association between such measures and prescribing for asthma in primary care will be an important area for future research. Finally, revised guidance on the management of asthma recommending earlier use of inhaled steroids, was issued by the British Thoracic Society in 1997 (Box One). Encouragingly, we found that over 70 per cent of asthmatic patients in primary care were being prescribed inhaled steroids in 1996, either alone or in combination with a bronchodilator. The further impact of the revised British Thoracic Society guidelines on prescribing in general practice will be examined in future analyses of data from the General Practice Research Database.

Box one

Current British Thoracic Society guidelines on the management of chronic asthma in adults and school children – guidance published in 1997

Step 1	Occasional use of bronchodilators
Step 2	Regular use of inhaled anti-inflammatory agents (steroids)
Step 3	High dose inhaled steroids or low dose inhaled steroids plus long acting bronchodilator
Step 4	High dose inhaled steroids and regular bronchodilators
Step 5	Addition of regular steroid tablets

British Thoracic Guidelines published in 1990 and 1993 emphasised the importance of the regular use of inhaled steroids in patients with mild or moderate asthma. The most recent revision of these guidelines published in 1997 further emphasised the importance of the early use of inhaled steroids. A step-wise approach to treatment is recommended with the objective of abolishing the symptoms of asthma as quickly as possible. Once control is achieved, treatment can be stepped down.

Key findings

- In asthmatic patients, inhaled steroids are used to reduce the severity of symptoms and the risk of patients suffering from sudden attacks of asthma.
- British Thoracic Society guidelines published in 1990 and revised in 1993 recommended that greater use of inhaled steroids should be made in the management of asthma in general practice.
- In 1996, about 6.6 per cent of males and 6.8 per cent of females were receiving treatment for asthma. Treatment rates for asthma were highest in children aged 5–15 years. Among adults, rates were highest in people aged 65 years and over.
- Between 1994 and 1996, the percentage of patients being treated for asthma who were prescribed bronchodilators in combination with inhaled steroids and/or inhaled cromoglycate increased from 62 per cent to 65 per cent in males and from 64 per cent to 67 per cent in females. The increase was greatest in children under five years of age (58 per cent of boys treated with both in 1996 compared with 47 per cent in 1994 and 55 per cent of girls treated with both in 1996 compared with 44 per cent in 1994).
- Over 70 per cent of asthmatic patients are currently being prescribed inhaled steroids by their general practitioners.

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