

Knowledge of and reported asthma management among South Australian general practitioners

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SUMMARY

Aim. This study, carried out in 1989, set out to assess general practitioners' knowledge of asthma management and their reported management practices.

Method. Of 153 randomly selected South Australian general practitioners 127 (83%) completed a questionnaire designed to explore issues relating to the management of asthma.

Results. The survey revealed substantial differences between general practitioners in their knowledge and management practices including the assessment of the severity of asthma, the need for objective monitoring, that is by the use of spirometry and peak flow meters, and the use of medication. Overall, the sampled general practitioners believed that patient-related factors were the main barriers to effective treatment of asthma.

Conclusion. The findings of this study suggest that ideal asthma management was not being attained. More research is required to ascertain why such variability among practitioners exists and how best to remedy these differences.

Keywords: asthma; management of disease; clinical knowledge; doctors' knowledge; Australia.

Introduction

GENERAL practitioners are in the ideal position to diagnose and manage chronic illness, including asthma, in the community. In Australia approximately one in five children and one in 10 adults suffer from this chronic condition.¹ The Research and Health Promotion Unit of the Royal Australian College of General Practitioners has undertaken the investigation of a number of chronic illnesses which are primarily managed in general practice, for example hypertension,^{2,3} with a view to using the data obtained to develop education strategies to try and improve patient care. This paper reports the findings as regards asthma.

Evidence exists that the management of asthma by general

practitioners needs to be improved. In the Netherlands Kaptein and colleagues reported, in a study of 150 general practitioners, that there was evidence of undertreatment of asthma patients, with marked morbidity such as wheezing at night and interruption of daily activities.⁴ Among Australian general practitioners only 43% of a sample of 193 general practitioners routinely measured airways function and approximately 20% believed that 'increased patient responsibility for asthma could be dangerous'.⁵ Commentators in the United Kingdom have called for improved patient education,^{6,7} objective assessment of severity,⁶ and innovative practice organization⁷ involving other personnel, such as the practice nurse, to improve the management of this common condition.

The aim of this study, carried out in March to July 1989, was to ascertain whether variability existed between general practitioners in South Australia in their knowledge of asthma management and reported management practices, to determine the extent of the variability and to document specific areas of deficiency.

Method

South Australia has an area of nearly one million square kilometres, approximately seven times that of England, with a population (1991 census) of 1 456 700, of whom 73% reside in the capital city, Adelaide. Large distances separate Adelaide from some country areas with country people having to travel 300–1000 km to visit asthma specialists.

The questionnaire used in this survey was designed by general practitioner members of the Research and Health Promotion Unit, RACGP, starting from a patient questionnaire designed by Rubinfeld and colleagues.⁸ The questionnaire comprised both open and closed questions, and explored issues of importance in asthma management including knowledge and attitudes regarding asthma in both children and adults, barriers to effective management, and the sociodemographic characteristics of respondents.

A stratified random sample of 150 city and 70 country general practitioners was generated from a master list of South Australian general practitioners held by the Research and Health Promotion Unit, with the intention of surveying 110 city and 50 country general practitioners. The first 10 of the city general practitioners to be selected were used to pilot the questionnaire and were approached in the same manner as the full survey group, but were telephoned once their reply had been received to ask about difficulties, ambiguities or other problems with the questionnaire.

The next 100 of the city general practitioners and the first 50 of the country general practitioners were surveyed by post, being sent a letter explaining the aims of the project and a copy of the questionnaire. Non-respondents to this approach were sent a further letter and copy of the questionnaire three weeks later. Those general practitioners who still did not respond were then personally telephoned by one of the authors (I S) to try and improve the response rate. Where a general practitioner was found to be ineligible for inclusion in the sample, he or she was replaced by the next practitioner on the original sample list.

Analysis of the differences between groups was undertaken by comparing proportions using chi square tests with Yates correction.⁹ Statistical significance was assessed at the $P < 0.05$ level.

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Results

Of the 210 general practitioners who were sampled, 57 were ultimately excluded from the sample because they had died, could not be located or were not in general practice. Of the remaining 153, 127 (83.0%) completed the questionnaire — 84 questionnaires were returned from the 104 city general practitioners sampled (80.8%), and 43 of the 49 country general practitioners sampled (87.8%). Thus, 33.9% of the respondents were country doctors. Not all of the respondents answered all of the questions.

Of the 127 respondents 74.8% were aged less than 50 years, 26.0% had been in practice for more than 20 years, and 47.2% held either the FRACGP or the DipObstRACOG. Of the 122 respondents who indicated their sex 85.2% were men.

Knowledge

Of the 123 doctors who responded to the question asking about the age groups of patients at greatest risk of death from asthma, 62 (50.4%) believed that the 0–20 years age group was at greatest risk, 30 (24.4%) the 21–40 years age group, eight (6.5%) the 41–60 years age group while 12 (9.7%) correctly believed the 61 years and over age group was at greatest risk (11 doctors (8.9%) did not know). The general practitioners' responses to a number of statements about asthma are presented in Table 1. In all instances a varying number of respondents provided the wrong answer or indicated they did not know the correct answer. For example, 23.1% of respondents disagreed with the correct statement that sodium cromoglycate takes up to three weeks to have a real benefit and 19.2% disagreed with the correct statement that during a severe attack of asthma a patient should take eight inhalations of a beta-agonist.

Table 1. Responses from general practitioners to various statements about asthma in adults and children.

Statement	% of GPs responding:		
	True	False	Uncertain
Allergy tests identify nearly everything that triggers asthma attacks ($n = 123$) ^a	3.3	92.7	4.1
NSAIDs can trigger asthma attack ($n = 118$) ^b	72.0	8.5	19.5
Aspirin can trigger asthma attack ($n = 120$) ^b	92.5	4.2	3.3
Certain foods can trigger asthma attack ($n = 122$) ^b	96.7	1.6	1.6
Beta-blockers commonly can trigger asthma attack ($n = 123$) ^b	87.8	8.9	3.3
Sodium cromoglycate takes up to 3 weeks to have a real benefit ($n = 121$) ^b	67.8	23.1	9.1
Sodium cromoglycate has no serious side effects ($n = 114$) ^b	87.7	7.0	5.3
Beclomethasone takes up to 3 weeks to have a real benefit ($n = 121$) ^b	49.6	45.5	5.0
Beclomethasone has no serious side effects ($n = 114$) ^b	53.5	43.0	3.5
If suffering a severe attack of asthma, a patient should take 8 inhalations in a few minutes of:			
A beta-agonist ($n = 120$) ^{b,c}	77.5	19.2	3.3
Beclomethasone ($n = 121$) ^{a,d}	17.4	76.9	5.8
Oral corticosteroids usually work within 20 minutes ($n = 122$) ^a	9.0	83.6	7.4

n = total number of respondents to each item. NSAIDs = non-steroidal anti-inflammatory drugs. ^aFalse statement. ^bTrue statement. ^cEquivalent to 800 µg. ^dEquivalent to 400 µg.

The general practitioners who correctly answered that beclomethasone takes up to three weeks to have a real benefit were statistically significantly more likely than those who incorrectly answered this question to report that reduced lung function is an important characteristic of mild asthma (18, 31.6%, compared with four, 7.3%; $\chi^2 = 10.5$, $P < 0.001$); greatly impaired lung function tests are an important characteristic of severe asthma (19, 33.3%, compared with five, 9.1%; $\chi^2 = 9.8$, $P < 0.01$); waking at night with asthma is very important in assessing the severity of asthma (46, 80.7%, compared with 33, 61.1%; $\chi^2 = 5.2$, $P < 0.05$) and it is very important to discuss compliance with asthmatic patients (56, 98.2%, compared with 48, 87.3%; $\chi^2 = 5.1$, $P < 0.05$).

Diagnostic characteristics

Using an open-ended question, the general practitioners were asked to list the nine characteristics they considered most typical of patients with mild, moderate and severe asthma. There was great variation between the respondents and it was only for two characteristics, both of severe asthma, that more than 50% of 116 respondents indicated the same characteristic — 'Obvious respiratory distress with wheeze' (64.7%) and 'Requires multiple therapy with or without steroids' (68.1%).

Assessment

Twenty one respondents (17.2%, $n = 122$) reported they never or rarely tested lung function when their asthmatic patients were well, 17 (13.8%, $n = 123$) never or rarely tested when their patients had an acute asthmatic attack, and 13 (10.6%, $n = 123$) never or rarely tested when deciding on more aggressive therapy. The vast majority of this sample (90.6%) reported that they had a peak flow meter at their surgery. While 47 respondents (37.0%) had a spirometer, only 33 (30.0%, $n = 110$) felt that the cost of this was justified, with 77 (70.0%) feeling it was not justified. Most respondents (83, 65.4%) reported they tested patients' lung function before and after use of a bronchodilator.

The participants were asked about the importance of particular factors in assessing the severity of asthma and of the 122 who responded, 110 (90.2%) thought patient denial of disease, and 119 (97.5%) patient underestimation of severity were very important, or of some importance. However, 12 (9.8%) considered patient denial was of no importance. The vast majority or all of 124 respondents recognized the importance of hospital admission in the previous year (98.4%), waking at night with asthma (100%), needing treatment on first waking (96.0%) and interference with daily activity (100%) in the assessment of the severity of asthma.

Treatment

The questionnaire listed 15 treatments for the management of chronic asthma in children and adults. The most commonly regarded as being very useful for children were education and counselling of parents (92.7%, $n = 123$), home nebulized salbutamol (85.4%, $n = 123$), inhaled beta-agonists (80.5%, $n = 118$), inhaled beclomethasone (67.8%, $n = 121$), and sodium cromoglycate (59.8%, $n = 122$). For adults they were inhaled beclomethasone (85.4%, $n = 123$), inhaled beta-agonists (87.0%, $n = 123$), home nebulized salbutamol (66.4%, $n = 122$) and theophylline (62.6%, $n = 123$). Regarded as very useful by fewer respondents for both children and adults were oxygen (12.8%, $n = 117$ and 18.3%, $n = 120$ respectively), antihistamines (0.9%, $n = 116$ and 7.5%, $n = 120$), antibiotics if the patients has a cold (13.8%, $n = 123$ and 18.0%, $n = 122$), dust mite control (28.5%, $n = 123$ and 17.4%, $n = 121$), steam (8.1%, $n = 123$ and 2.5%, $n = 121$), and ipratropium (13.2%, $n = 121$ and 26.4%, $n = 121$). All but four of the respondents found theophyllines either very

useful or of some use in children, and all but one similarly in adults.

The management strategies always or often used in an acute severe asthma attack are shown in Table 2. Interestingly, 65.9% of respondents always or often referred a patient with such an attack to a hospital or specialist. Differences were found in respondents' views about the management of adults and children with 87 respondents reporting they were always prepared to prescribe oral corticosteroids in a severe asthma attack in an adult (68.5%), compared with 26 (20.5%) in a severe attack in a child; 72 (56.7%) always or often referred children for further assessment before using oral corticosteroids.

Ninety one respondents (71.7%) reported they had a nebulizer at their surgery but only 60 (47.2%) reported they had an oxygen cylinder with a flow meter for the nebulizer.

Of 124 respondents, 63 (50.8%) reported they always or often asked their asthmatic patients to measure their asthma objectively by means of a peak flow meter, 38 (30.6%) sometimes did this and 23 (18.5%) rarely/never organized this activity. The majority of respondents (79.5%) requested that patients record these readings when they did undertake monitoring.

A substantial number of respondents (80, 63.0%) reported that they sometimes or more often issued repeat prescriptions without seeing the patient, but 52 (40.9%) felt that inhalers should never be available over the counter. Eighty eight (69.3%) reported that they asked their patients to demonstrate inhaler use often or at every consultation. The majority of this sample of practitioners believed that most of their patients often or always knew the fastest route to emergency care (108, 85.0%) and when to start using steroids (65, 51.2%).

Only a small minority of respondents (10, 8.2%) reported they always or often used a recall system for their asthmatic patients.

Table 3 presents the respondents' views about the barriers to the effective treatment of asthma (closed questions). Patient compliance was believed to be a substantial barrier by 54.8% of respondents, with a further 40.3% believing it to be a minor barrier. The majority of practitioners (114, 89.8%) believed it was very important to discuss items related to asthma management with patients and 108 (85.0%) reported always or often working out management plans with their patients. However, side effects of drug treatment and the importance of ongoing monitoring were considered very important by only 82 (64.6%) and 78 respondents (61.4%), respectively. Eighty four of the respondents (66.1%) felt that they had adequate training in asthma management.

Discussion

This questionnaire survey of reported asthma management among general practitioners reveals substantial variability and important deficiencies in reported management practice. In step

Table 2. Management strategies always or often used by general practitioners in an acute severe asthma attack in an adult or child.

Management strategy	% of respondents
Inhaled nebulized bronchodilator (<i>n</i> = 123)	93.5
Increased bronchodilator ^a (<i>n</i> = 118)	83.1
Referral to hospital or specialist (<i>n</i> = 123)	65.9
Oxygen (<i>n</i> = 116)	62.1
Oral corticosteroids (<i>n</i> = 120)	59.2
Intravenous corticosteroids (<i>n</i> = 119)	37.8
Intravenous aminophylline (<i>n</i> = 119)	33.6
Adrenaline (<i>n</i> = 117)	8.5

n = total number of respondents to each item. ^aRelative to normal daily dose.

Table 3. General practitioners' perceptions about barriers to the effective treatment of asthma.

Barrier	% of respondents believing:		
	Substantial barrier	Minor barrier	Not a barrier
Continuing to smoke (<i>n</i> = 124)	67.7	31.5	0.8
Compliance (<i>n</i> = 124)	54.8	40.3	4.8
Difficulty avoiding trigger factors (<i>n</i> = 123)	41.5	49.6	8.9
Necessary lifestyle changes (<i>n</i> = 121)	33.9	58.7	7.4
Frequency of required medication (<i>n</i> = 123)	30.1	64.2	5.7
Effect of 'labelling' patient as asthmatic (<i>n</i> = 120)	20.0	50.8	29.2
Lack of ongoing monitoring (<i>n</i> = 122)	15.6	67.2	17.2
Lack of adequate patient education material (<i>n</i> = 124)	8.9	54.8	36.2
Side effects of drug treatment (<i>n</i> = 122)	8.2	79.5	12.3
Cost of diagnosis and treatment (<i>n</i> = 123)	8.1	43.1	48.8

n = total number of respondents to each item.

one of the asthma management plan of Australia and New Zealand¹⁰ released in 1989 the factors that can identify patients with severe asthma were waking at night with wheezing or cough; hospital admission in the last 12 months; bronchodilator use more than four times a day; significantly impaired lung function tests and a previous life threatening asthma attack. These factors were chosen by fewer than 50% of respondents in this study. The identification of asthmatic patients at greatest risk of dying from the disease is a prerequisite in lowering asthma mortality⁷ and it is disturbing that the identifying factors of severe asthma were not chosen by more of the general practitioners responding to this survey. It is also of concern that only 10% of respondents knew that the age group at greatest risk of death from asthma is the 61 years and over age group.^{1,11}

The second and third steps of the Australian asthma management plan¹⁰ involve measuring lung function when the patient is well, when deciding on optimum therapy to achieve best lung function, and when there is a need for more aggressive therapy. The UK guidelines for the management of chronic asthma recommend patient training in the use of a peak flow meter,¹² as do the American national guidelines¹³ and the international consensus.¹⁴ It was notable that 17% of the respondents in this study did not test lung function when the patient was well and 11% did not test when deciding on more aggressive therapy. However, 91% of the respondents indicated that they had a peak flow meter. This disparity indicates a lack of understanding by some general practitioners that asthma needs regular monitoring and objective assessment, and not just reactive management during an attack.

The measurement of forced vital capacity and forced expiratory volume in one second, via spirometry is a more sensitive measure of respiratory lung function than that obtainable by peak flow meter but only 37% of the respondents reported they had a spirometer, and an even smaller percentage (30%) agreed that the cost of a spirometer was justified. What is not clear from these results is whether the presence, or absence, of a spirometer has any effect on asthma management in primary care.

The use of high doses of inhaled corticosteroids has increasingly been emphasized as a mainstay of treatment, particularly in severe asthma.^{12,15} Beclomethasone was considered by the majority of sampled general practitioners to be an integral part of the management of chronic asthma in adults and children. However,

misconceptions still existed. Fewer than 50% of the sample correctly agreed that beclomethasone takes up to three weeks to have a real benefit. Further analysis of this question revealed interesting associations with accepted asthma management practice. Those who answered correctly were significantly more likely to report that reduced lung function is an important characteristic of mild asthma; greatly impaired lung function tests are an important characteristic of severe asthma; waking at night with asthma is very important in assessing the severity of asthma and it is very important to discuss compliance with asthmatic patients. These associations indicate that knowledge of the accuracy of the statement about beclomethasone may be an important marker of appropriate asthma management.

The administration of high flow oxygen is advised for all severe asthmatic attacks,¹⁶ yet fewer than half of the sampled general practitioners had an oxygen cylinder with flow meter for their nebulizer, and only 62% reported that they would always or often use oxygen in an acute severe attack.

Mortality studies have noted the importance of patient denial as a risk factor for life-threatening asthma.^{4,17} One in 10 of the sampled general practitioners thought that patient denial was of no importance in assessing the severity of asthma. Reassuringly almost all the respondents indicated that patient underestimation was important.

With regard to drug therapy for chronic asthma all but four of the respondents found theophyllines either very useful or of some use in children, and all but one similarly in adults. This is of some concern because many commentators have noted behavioural disturbances following use of theophyllines in very young children.^{18,19} Sly noted that 'poor concentration and decreased school performance have been reported in older children'.²⁰ Trigg and Davis have gone so far as to argue that sustained release theophylline should only be used in carefully selected children where other therapies are not well tolerated or fail to control severe chronic asthma.²¹

Many of the respondents believed that patient centred factors such as denial, lack of compliance and continuing to smoke were substantial barriers to the effective treatment of asthma while practitioner factors such as lack of monitoring or labelling, that is informing a patient he or she has asthma, were believed to be less important. In Australia, Robertson and colleagues found that of 161 deaths attributable directly to asthma in 1986-87, 46 (29%) could be considered preventable.²² The most important preventable factors in these deaths were inadequate assessment or therapy of previous asthma attacks (16 deaths), poor compliance with seemingly appropriate therapy (14) and delay in seeking professional help (19). This would indicate that both patient and practitioner factors are of importance. The authors noted that there was inadequate information to assess how preventable the death was in a further 37 cases (23%).

Comparison of the respondents with the overall cohort of general practitioners in South Australia revealed that the sample had a higher percentage of country doctors and a smaller percentage of respondents who had been in practice more than 20 years (report, South Australia Health Commission, 1988). This may have resulted in some minor misrepresentation of reported asthma management but given the response rate of 83% it can be concluded that the results give a representative picture of reported asthma management among general practitioners in South Australia. One deficiency of this study is that the results are based on general practitioners' self-reported management practices. It is probable that there is a difference between reported and actual practice and there is some evidence that reported practice is more acceptable than that which actually occurs. For example, Dickinson and colleagues showed that general practitioners believed they detected 80% of their patients who smoked when they actually detected 52%.²³

This study has identified substantial variability and deficiencies in reported general practitioner management of asthma. The reason for the variability is unclear but against a background of a relatively high incidence of asthma deaths in Australia, it is not reassuring. These results reinforce the need for strategies to improve asthma management such as the National Asthma Campaign, which commenced in 1989, and self-directed continuing medical education for general practitioners.²⁴ The impact of these, and other strategies, should be evaluated so that alterations can be made when desired changes are not achieved.

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