PRACTICE OBSERVED

Practice Research

Prevalence and management of asthma in children under 16 in one practice

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Abstract

The prevalence of childhood asthma in a small town in west Cumbria was studied. Medical records were scrutinised for keywords, children who were entered in the study were examined, and their parents were interviewed. A control group of children who were matched for sex and age was used to estimate the prevalence of asthma for the practice in the town. At the same time treatment was evaluated and where necessary. As expected, asthma in children was grossly underdiagnosed. The prevalence of asthma in children aged under 16 years in the practice was 15.6%, although the recorded prevalence before the study was only 7.8%. Treatment was inadequate for 42% of the children. The reasons for this were explored, and recommendations were made on management.

Introduction

The results of several studies have shown that asthma in childhood is underdiagnosed and undertreated.¹⁻³ Eleven per cent of a sample of 7 year old children in north Tyneside had features of asthma, although only 21 of the 179 children studied had been diagnosed as having asthma, and two thirds of the children had never received a bronchodilator.⁴ In a study in general practice of children under 11 there was a recorded prevalence of asthma of 10%, although an average of 16 to 20 consultations for respiratory problems had been made before asthma was diagnosed.⁵ Toop studied a cohort of 7 year old children and found that although only 8% had the diagnosis of asthma recorded in their medical records the prevalence reached 14% when children who had a significant score of keywords in their records and a positive exercise test were

included.⁶ It seems, therefore, that in every practice an appreciable number of children with symptomatic undiagnosed asthma exists. The aims of this study were: (a) to estimate the prevalence of asthma for this practice in children aged under 16 by assessing all children who had positive keywords in their medical records and by studying a control group of "normal" children and (b) to assess the management of the children.

Methods

The practice is in a semi-rural area of west Cumbria and has 3500 patients, who are mainly in social classes IV and V. The medical records of all 655 children aged under 16 years in the practice were scrutinised for the following keywords: asthma, wheezing, bronchitis, wheezy bronchitis, recurrent chest infection, nocturnal cough, excreta wheezy, hives, urticaria, Biscardi, or another bronchodilator treatment. Parents of all children with a keyword in their records (the study group) were interviewed using a standard questionnaire, and the children were examined. A control group of 114 children was matched for age and sex with the study group. Parents of children in the control group were sent the same questionnaire, together with a stamped, addressed envelope. When questionnaires from the parents of children in the control group had positive replies for any keywords the parents were interviewed and the child examined.

The determining factors in the diagnosis of asthma were a history of recurrent wheezing or nocturnal cough, a positive reaction to bronchodilator treatment, exercise induced wheezing, and a family history of asthma or atopy. The examination consisted of measuring height and weight, auscultation, examining the shape of the chest, and measuring the peak flow rate.

Results

Thirty one (8.6%) of 361 boys and 20 (8.8%) of 294 girls had a diagnosis of asthma recorded in the notes, suggesting an overall prevalence of 7.8%, but 80 (22.2%) boys and 42 (14.3%) girls had positive keywords in their notes. After the parents were interviewed and all 122 children in this study group had been examined a definite diagnosis of asthma was made in a further 22

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assessment and treatment—and day hospitals, of which some seem to provide mainly social day care, is poorly understood. Brookhurst suggested that at hospital units aim at providing treatment, especially physical rehabilitation and maintenance, medical investigation, nursing care, and social care, where this requires medical and nursing staff.⁷ Yet many geriatricians and general practitioners now use their day hospitals principally for multidisciplinary assessment of patients who might otherwise require admission, whereas others see the day hospital as a major

obtained for those who were affected by the dispute by identifying the reasons for non-attendance of all those who failed to attend at the end of the dispute and cross checking this information with a variety of sources. This inquiry may, of course, have underreported the data for the group, notably with regard to illness under the general practitioner's care. Every patient who had failed to attend the day hospital in the first year of the dispute was accounted for from the attendance register.

Inquiry was made of the causes of death or hospital admission in each case. Death was taken to mean any death occurred within two months of the start of an episode of illness; a hospital admission was any that occurred

TABLE 1—Number of deaths among day hospital patients in the ambulance dependent group

	Year					
	1974	1975	1976	1977	1978	1979
27 July-6 November	3	2	3	8	2	1
7 November-11 December	2	9	2	2	4	1
Total No of deaths between 27 July	118	99	118	100	103	100

Comparing the ratio of deaths in the total population for July-November 1978 with that for the control patients, $\chi^2 = 8.2$ (Yates's correction, 1 d.f., $p < 0.01$). The comparable calculation for November-December shows no significant difference.

source of long term relief for relatives from the difficulties of caring for the elderly in their own homes. This disparity has not helped in assessing the value of attending at day hospitals, and no properly controlled trials have been carried out to show an unequivocal benefit.

The results of a controlled trial by Woodford-Williams and colleagues in 1962 suggested that those who attend day hospital might expect to spend shorter periods as inpatients if they attended a day hospital for more than six months, although in the first six months the converse appeared to be true, neither figure being significant.⁸ Others, both in the UK and overseas, have suggested that reduced bed occupancy in hospital is associated with the provision of day hospitals,⁹ and that hospital admission of up to 7% of the elderly might be prevented, delayed, or curtailed by providing a day hospital.¹⁰ The effects of temporarily closing two day hospitals have, however, been measured. The first showed deterioration of patients as assessed by the staff but with no controls or objective criteria of assessment,¹¹ whereas the second showed few ill effects after six weeks' closure.¹² The results of a recent study of patients with senile dementia who attended a psychogeriatric day hospital suggested that this type of day care (often provided by geriatric day hospitals) also did not defer the need for hospital admission nor provide an alternative to inpatient care.¹³

Not surprisingly perhaps, the need for further research into the possible benefits of care in geriatric day hospitals was identified by the Common Services Agency of the Scottish Health Service.¹⁴ It was suggested that we need to determine whether day hospitals provide effective treatment and preventive care, and whether this method of care uses hospital resources for the elderly more economically. An industrial dispute in 1978 resulted in the effective closure of a large geriatric day hospital for 16 weeks. This provided an opportunity to collect data which might answer these questions.

Method

The day hospital studied maintains an attendance register with meticulous accuracy, recording the reasons for absence of all non-attenders. The register provided a list of all patients who had attended before, and should have attended on, 27 July 1978—the first day that transport was withdrawn owing to the dispute. The few patients who were unable to attend at the end of the dispute—for example, by refusing or moving—were then excluded from the list. Following the same criteria, cohorts of control patients were obtained for the preceding four years and subsequent two years. A change in catchment area rendered the use of additional years

The incidence of death, hospital admission, admission to local authority homes, and illness requiring treatment by the general practitioner for more than three weeks was obtained for all seven cohorts. This information was

during the study period. The hospital records were scrutinised in each case and this included all the major acute hospitals in the city. The result of hospital admissions was also recorded for each cohort. Each cohort was assessed in terms of physical dependence, continence, and recorded mental state. Finally, the mortality and morbidity data for the period 7 November to 31 December—that is, immediately after the normal year at the day hospital—were reviewed—compared with those for the controls over the same calendar period.

Results

There were no abnormal climatic factors during the period of the dispute, nor were there any major epidemics such as influenza. The cohorts in each year of the study were of roughly equal size as around 100 patients. The distribution of the sexes, the age range, the level of resident domestic support, and the principal pathology at admission to the day hospital were similar for the control patients and those affected by the dispute.

The assessment of dependence, continence, and mental state was eventually abandoned for two reasons. Firstly, the hospital records were incomplete, and secondly, the data varied too greatly over too short a time to be of value. Nevertheless, at the midpoint of the study period for 1979 roughly 90% of patients had impaired mobility, 29% requiring assistance with walking or wheelchair. About half had been confused at some point.

Table 1 gives an analysis of deaths. During the year of the dispute the number of deaths was substantially higher than that in the control years ($p < 0.01$). Table 11 shows that the number of hospital admissions also increased substantially during the dispute compared with the expected figure based on the other six years ($p < 0.02$). The number of admissions to the main geriatric hospital did not alter substantially, the greatest increase being to acute hospital wards.

The analysis of the outcome for all hospital admissions (table 11) suggests that the main change during the year of the dispute was a greater number of deaths in hospital, as expected from table 1. The proportion of subsequent hospital discharges fell from 58.3% to 53.8% for the study group, which is not significant. The numbers of deaths and hospital admissions for the two months after the dispute suggest, if anything, a slightly sustained increase for both compared with those in the control years. Neither figure is significant.

Scrutiny of the records for all deaths and hospital admissions in the control cohorts and the group affected by the dispute showed no identifiable pathological features to be more common among the latter. Men who attended the day hospital were more often admitted to acute hospitals than women in all the years studied, but the proportion of men was not altered by the dispute. There was no appreciable difference between the rates of hospital admission or death in relation to home support: patients who lived alone or with younger relatives appeared to fare marginally better than those who lived with an elderly spouse. The numbers were too small to analyse further.

These results show more evidence than previous studies of the harmful effects on patients when day hospital care is withdrawn. Nevertheless, they should be interpreted carefully. In particular, the number of deaths is small. Though the figures for deaths and admissions during the dispute lie outside

boys and 12 girls, giving a total of 53 (14.7%) boys and 32 (10.9%) girls, an overall prevalence of 13%. The physical examination contributed little to the diagnosis: only one child was wheezing at the time of the examination and random peak flow rate was normal in all but four children. Thirty seven of the 122 children with positive keywords in their records had no evidence of asthma on careful review during the study.

Control group.—Seventy six (67%) of the 114 questionnaires sent to parents of children in the control group were returned. Twelve children were reported to have had episodes of wheezing or nocturnal cough. After interviewing the parents and examining the children a definite diagnosis of asthma was made in two children from the control group. When extrapolated to the rest of the practice, therefore, the overall prevalence of asthma in children under 16 increased to 15.6%.

Other factors.—The most common precipitant of wheezing in the 87 children with asthma was a viral upper respiratory tract infection (38%). A quarter had exercise induced wheezing, a tenth wheezed on exposure to dust, and a few wheezed after contact with pets. Roughly three quarters of the children with asthma had a family history of asthma compared with a quarter of the control children, and two thirds had a family history of atopy compared with fewer than a fifth of control children. One or both parents of three quarters of the children with asthma smoked a total of 14.5 cigarettes a day, compared with fewer than a fifth of control children. Half of all parents in the study and control groups smoked.

Management.—Thirty nine (44.8%) parents of the 87 children with asthma were aware of a diagnosis. Only four parents of the 34 children with asthma for whom a diagnosis had not been entered in the notes knew the diagnosis. Forty three (49%) of the 87 children with asthma were having regular treatment. For 18 (42%) of these children the treatment or the inhaler technique was considered inadequate, 12 (67%) of these 18 children were poorly controlled, having had four or more attacks of asthma in the 12 months before the interview and having missed a total of 190 days of school. Sixteen newly diagnosed children needed specific advice on management. The most common faults in treatment were failure to prescribe or use adequate preventive treatment, confusion between the prevention and the treatment of wheeze, or poor inhaler technique.

Discussion

This study confirms that asthma is underdiagnosed in general practice. For only 51 (58.6%) of a final total of 87 children with asthma had the diagnosis been recorded in the notes. Screening the

children who had positive keywords in their notes led to the diagnosis of a further 34. Although 37 of the children with positive keywords had clinical evidence of asthma at the time of the study, this does not preclude the development of asthma later.¹⁵ Two further children in a control group of "normal" children were found to have asthma. This suggests the existence of a group of children who will remain undiagnosed after a careful search of all medical records. Assuming that the control group was representative of all children in the practice, as many as 15 children with asthma may remain undiagnosed. All children who present with cough and no evidence of infection should be carefully screened for symptoms of asthma, particularly if there is a family history of asthma or atopy.

Treatment in 42% of the children with asthma was thought to be inadequate. The effective management of asthma in children requires the support of parents and education. Eighty eight percent of the parents of the 36 children whose asthma was unrecorded were unaware of the diagnosis, making it unlikely that their children's asthma will be efficiently managed. Even when the diagnosis was recorded and conventional treatment prescribed the "delivery" of treatment to the child was often poor because of the failure to use prophylactic treatment adequately and poor inhaler technique. This resulted in frequent attacks of wheezing and appreciable absence from school for some children. Children with asthma and their parents need careful follow up and regular education on treatment and prophylaxis.

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Increase in acute admissions and deaths after closing a geriatric day hospital

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Abstract

In 1978 the normal function of a large geriatric day hospital was halted by 16 weeks of industrial action. Comparing affected patients with a matched control population for the years 1974-80 showed an appreciable increase in acute hospital admissions and deaths of those affected by the stoppage, which suggests an obvious benefit for those who are selected for attendance at a geriatric day hospital. Neither the number of acute admissions nor the number of deaths during the two months after normal services were resumed differed appreciably from those in the control years. No single cause predominates among those reported for acute admission or death during the affected year.

These findings are relevant given the recent closure of several day hospitals by health authorities to cut costs. There are no published figures showing unequivocal benefits for attendance at day hospitals, and many clinicians remain unaware of their function. Yet adequate provision for day hospitals may ease the pressure on more costly acute hospital beds.

Introduction

Geriatric day hospitals in the United Kingdom originated in the 1950s, the first to be purpose built was probably in Oxford. By the late 1970s there were several hundred, varying widely in structure and in function.¹ Despite this rapid development most general practitioners and probably most hospital doctors remain unaware of the services and facilities that day hospitals were designed to provide.² In particular, the difference between the services of day centres—some of which come close to providing day hospital

TABLE 11—Number of admissions and numbers of patients with prolonged illness under general practitioner's care in the ambulance dependent day hospital population

	Admissions		Long term		In general practitioner's care at three weeks		Total population
	Geriatric assessment	Acute	Local authorities	Total	Total	Total	Total
27 July-6 Nov 1978	9	9	0	0	18	4	118
7 Nov-11 Dec 1978	11	15	1	0	27	1	118
12 Dec-16 Jan 1979	8	8	1	0	17	1	114
17 Jan-20 Feb 1979	11	15	1	0	27	1	106
21 Feb-25 Mar 1979	8	8	1	2	17	1	100
26 Mar-30 Apr 1979	2	10	0	0	12	1	114
1 May-4 Jun 1979	4	8	0	0	12	1	118
5 Jun-8 Jul 1979	4	8	0	0	12	1	114
9 Jul-12 Aug 1979	4	8	0	0	12	1	106
13 Aug-16 Sep 1979	4	8	0	1	14	1	100
17 Sep-20 Oct 1979	4	8	0	1	12	1	104
21 Oct-24 Nov 1979	4	8	0	1	14	2	100

Comparing the ratio of admissions to total population affected by the dispute with that for the controls, $\chi^2 = 8.0$, 1 d.f., $p < 0.02$.

TABLE 111—Outcome for patients admitted to acute and assessment units 27 July-6 November

Outcome	Year						
	1974	1975	1976	1977	1978	1979	1980
Discharged home	10	14	8	8	14	16	10
Long-term institution	5	2	3	1	5	1	6
Death within two months	1	1	1	1	1	1	1
Total population at 27 July	118	99	118	100	106	103	100

The greatest disparities in the number of deaths in between the patients in the dispute year and the controls, and this contributes substantially to the total number of deaths in table 1. The numbers discharged and institutionalised were not significant.

the confidence values for the control years, it is assumed that the latter are all comparable. Testing a two by six table using χ^2 supports this view, but testing a two by seven table including the period of the dispute also gives no significant differences.

Discussion

The findings of this study show that closing one particular day hospital had adverse consequences for its patients. Day hospitals, however, vary widely in their function, and, as Urquhart suggested, a different conclusion might be drawn from a multicentre study.³ Furthermore, although attendance at a day hospital was identified as beneficial overall, it proved impossible to identify which of the facilities—medical, nursing, physiotherapy, occupational therapy, or social—was responsible. The day hospital in this study had a high proportion of patients who were receiving medium or long term maintenance treatment or for whom relief for relatives was provided, and few attended for short term assessment or rehabilitation. The numbers are too small to say whether it was the former or latter group that suffered most by its closure.

It has been calculated that attendance at day hospitals, together with the associated costs of community care including a proportion of the costs of general practitioners, district nurses, rates support, social security payments, etc. is substantially cheaper than an acute hospital bed.⁴ Arguably, it is little different from the cost of long term care in an institution. The results of the study show that attendance at day hospitals seems to prevent the need to occupy acute hospital beds to some degree. But long term places are always in short supply, and it is possible that, had these places been available as an alternative to day hospital care, the use of an acute bed might not have been required. Nevertheless, many of the patients concerned might welcome the option of the day hospital with continued community care. It is probably unrealistic to suppose that there will ever be sufficient long stay accommodation. Even so, the Department of Health's stated goal of two day hospital places per 1000 population over the age of 65 translates to only 0.6

places per general practitioner with an average sized list of patients. Primary care teams have every right to question the adequacy of this provision. Some geriatricians have suggested that it meets the present level of referrals,⁵ though perhaps not the level of need. But if day hospital care is shown to be a beneficial addition to caring for the growing number of very elderly people in the community, this must surely be in doubt. Furthermore, it has yet to be shown that less expensive facilities, such as community day centres, could not provide similar benefits provided that adequate arrangements were made for patients who are severely disabled or confused.

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