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Current topic

Is the prevalence of asthma changing?

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There appears to be a widespread belief that asthma in children is increasing in the United Kingdom. This idea may have sprung from paediatricians whose clinical experience, supported by admission statistics, suggests that wheezing illness comprises an increasing proportion of their work. It will also have been fuelled by reports that mortality in young people may be increasing,[1] and that there has been an increase in patient consulting rates in general practice.[2] The spectre of the 1960s epidemic of asthma deaths lingers to remind us that mortality may be subject to unexpected change. But how well founded is the belief that prevalence is changing? In attempting to answer this question I shall briefly review trends in available indicators of asthma morbidity in children.

What is meant by prevalence?

Prevalence may refer to the proportion of the population with evidence of asthma: (a) at the point of enquiry (point prevalence); (b) over a defined prior period (period prevalence); or (c) at any time in their life (life time prevalence). Point prevalence is the easiest to measure precisely but because of the fluctuating nature of asthma will tend to underestimate the problem. Life time prevalence is often used but is seriously affected by failure (frequently selective) of recall. Period prevalence, usually over the previous year, is the compromise measure now usually adopted.

Prevalence of what?

Asthma is the label for a condition that is characterised symptomatically by wheezy dyspnoea that varies over time either spontaneously or as a result of treatment. The most widely agreed definition is based on the physiological criterion of variable limitation of airflow,[3] but this is difficult to apply in epidemiological studies and there is little agreement about how to express variability or about how much variability constitutes 'asthma'. The demonstration of hyper-responsiveness of the airways to exercise or pharmacological agents has been used in epidemiological surveys but is subject to problems of interpretation because it lacks specificity for asthma, and has, at usual cut off levels, insufficient sensitivity to identify asthma which is mild or in remission. In any case, serial data using these measures are not available to examine trends over time.

The presence of a diagnosis of 'asthma' is of little use epidemiologically. Wheezing that is mild, does not present as 'attacks', is infrequent, or which occurs only with infection may not be labelled as 'asthma'. Doctors vary in the way they label wheezing illness and in other clinical decisions such as referral and drug prescribing.[4 5] Families also vary in their willingness to accept the label. All of these factors might change over time. Thus any analysis of trends that relies on diagnosed asthma or its treatment must be interpreted with caution.

The symptom of wheeze remains the cornerstone of the epidemiological assessment of asthma on a large scale and is all that is available to examine trends. However, there is no agreed way of grading wheeze symptom by severity. Wheeze questions often refer to 'attacks' but a proportion of wheezy children do not have attacks.[6] The use and interpretation of the term 'wheeze' might also be subject to trends over time.

Prevalence surveys

Planned serial prevalence surveys of wheezing illness have not been carried out in the United Kingdom. One must therefore rely on a motley collection of studies that have varied in the questions asked, methods by which the information was elicited, age of the children, size and type of sample, and locality. These are summarised in the table.[6–20] Estimates of prevalence of wheezing over the last year or which was described as 'current' or 'recent' show little evidence of a trend; the most recent estimate of 11·5% from Nottingham in 1986 is the

Table *Prevalence studies of childhood asthma and wheezing in the United Kingdom*

Year of study	*Reference No*	*Area*	*Age of subjects (years)*	*No of subjects*	*Prevalence (%)*				
					Wheeze			*Asthma*	
					Last year	*Recent*	*Ever*	*Recent*	*Ever*
1964	7	Aberdeen	10–15	2511		11·5		4·8	
1964	8	Isle of Wight	9–11	3300				2·3	
1965	9, 10	National	7	14571	8·1		18·3		3·1
1967	11	Kent	5–14	10971					3·8
1968–	12	North West London	5	2037			24·9		3·2
1968/9	13	Birmingham	5–18	20958		5·4	9·9	2·3	4·2
1969	14	National	11	13557	4·9		12·3	2·0	3·5
1973	15	South Wales	12	817	10·2		17·0	4·2	
1974	16	Birmingham	5–6	3773		7·5		2·3	
			15–16	3681		4·3		2·4	
1975	17	National	5	12977			20·8		2·1
1978	6	South West London	9	5100	11·1		18·2	3·3	4·0
1979	18	Newcastle	7	2700	9·3				1·2
1984	19	South West London	5–13	5287	15·0		17·0		5·0
1986	20	Nottingham	5–11	4750	11·5			5·9	

same as that obtained in the earliest survey carried out in Aberdeen in 1964, and not far from the one year period prevalence of 8·1% obtained in 1965 in a national survey. The recent rate of 15·0% from South London is relatively high but may reflect the sensitivity of the particular questionnaire used. There is more variation in the prevalence of diagnosed 'asthma' with some tendency for this to increase in recent years. There has been least variation in life time prevalence of wheeze with no evidence of a trend. On the basis of these data there appears to be little reason to be concerned that the prevalence of wheezing illness in children has increased to any significant degree. Most of the variation is more plausibly explained by methodological differences than by actual changes over time.

Mortality

If, despite the fairly stable prevalence over time, asthma morbidity were increasing, the explanation would need to lie in an increase in the frequency and severity of attacks experienced by asthmatics rather than in an increase in the proportion of the population with the disease. If so, this is not reflected in mortality statistics (figure).[21] In the 0–4 year age group rates have fallen steadily. In the 5–14 age group the current rates (1985) are lower than in the late 1950s. This is despite the fact that changes in International Classification of Diseases coding rules have resulted in diagnostic transfer towards asthma as a cause of death.[22] Thus the underlying trend is probably even more encouraging than it appears.

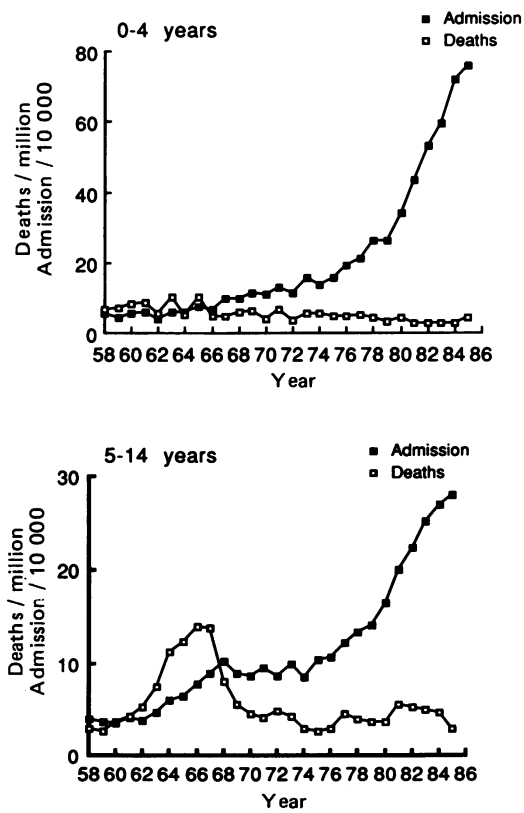

Figure *Trends in admissions and deaths for asthma in the 0–4 and 5–14 age groups. Sexes combined.*

Hospital admissions

The increase in hospital admissions for asthma has been nothing less than spectacular (figure).[23] It cannot be explained by diagnostic transfer or changes in coding.[24 25] Apart from a temporary increase in the mid 1970s, readmission rates are unchanged since 1970 indicating that more children are being admitted (HR Anderson, in preparation).[26 27] There has been a marked increase in self referral and this is related in part to the introduction of nebulisers which have increased the expectations of parents and their preference for hospital care.[27] If the increase in admissions were due to medical care factors one would predict a reduction in the severity 'threshold' for admission; however, data relating to this are meagre and equivocal. From 1960 to 1985 the average length of stay for the 5–14 age group declined from 24 to 3·7 days, and for the 0–4 age group from 11 to 2·5 days and it is likely a decline in severity has contributed to this, along with improvements in treatment.

It is important to appreciate the potential of shifts in the balance of care to increase hospital admissions. It can be estimated from surveys and routine data that in one year, among 10 000 children aged 5–14, 1100 will have episodes of wheezing and at least 150 will experience severe attacks at least once.[6] About 18 will be admitted a total of 27 times.[26] Thus a relatively small shift in the ways in which families and their general practitioners make decisions in the community could have a marked effect on hospital admissions without there being any change in underlying morbidity.

General practice

Surveys of volunteer general practices in 1970–1 and 1981–2 have found an increase in patients consulting rates for asthma for the 0–15 age group of 80% for boys and 112% for girls.[2] However, the base for this increase is fairly low (2% boys and 1% girls). Thus the increase could easily reflect an increase in presentation to the general practitioner. Equally important there is the likelihood that the diagnosis of asthma is being more frequently applied by general practitioners after reports of substantial underdiagnosis of asthma in wheezy children.[4 5] This is supported to some extent by recent survey evidence.[20]

Conclusion

Data directly related to prevalence are not entirely satisfactory but such that exist do not support the assertion that there has been an increase in the proportion of the child population who experience wheezing illness. If, nevertheless, asthma is increasing it must therefore be due to an increase in severity but there is no direct evidence concerning this. An indirect indicator, mortality, is not increasing. The increase in hospital use could be explained by a shift in the balance of care due to medical care factors, though it is interesting that readmissions have not increased. The increase in utilisation of general practitioners could be due to diagnostic transfer as well as to an increased tendency of families to seek consultation. An attitude of scepticism is appropriate. Nevertheless, because of the importance of this issue, consideration should be given to the setting up of a simple method of conducting serial surveys among samples of the child population to monitor the situation over the coming years.

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