Sport and the asthmatic child: a study of exercise-induced asthma and the resultant handicap

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SUMMARY. A group of 111 asthmatic children was studied using a self-administered questionnaire to investigate exercise-induced asthma and how it affected their participation in sport.

Although selected to represent the severe end of the spectrum of general practice asthma, most children reported relatively mild asthma, with attacks less than once a week. Even so, 97 of the children (87%) experienced exercise-induced bronchospasm, 74% fairly frequently. Just under one-half of those who suffered exercise-induced asthma did not treat it adequately and even more of them never used adequate prophylaxis.

Forty-three children occasionally had to miss sport because of asthma, 24 had received advice to avoid certain sports and 28 had at times been unable to complete a game involving exertion. Given the importance of sport the findings suggest that asthma can be a real social handicap.

Introduction

SEVENTY to eighty per cent of people with asthma develop airflow limitation after vigorous exercise. This is known as exercise-induced asthma. Children tend to find it more troublesome than adults because they take more exercise.

Nevertheless regular exercise does have physical[1] and psychological[2] benefits for the asthmatic child. Reduction in medication,[3] the frequency and severity of asthma,[3,4] and absenteeism from school[4] have all been reported. Sport is also an important avenue of social development. It would seem reasonable, therefore, to permit the asthmatic child to lead as normal a physical and sporting life as possible, especially as effective medication exists for both the prevention and treatment of attacks of exercise-induced asthma.

However, although most authors agree that asthmatics are limited in their ability to take part in sport and physical recreation, their information is usually based on clinical experience or laboratory testing of hospital populations. Very little research has been carried out in the community or primary care. One important study carried out by Anderson and colleagues[5] on schoolchildren in Croydon suggested that limitation of physical activity in asthmatics was less than might be expected.

It is important to know the extent of problems with sport for asthmatics in the community, where reports put the prevalence of childhood asthma between 10% and 25%.[5-11] The general practitioner may have many children handicapped by asthma registered with him or her and needs to be aware of the true situation so that efforts may be channelled towards education, changing attitudes, mobilization of other agencies and effective drug therapy. The present study looked at the prevalence of exercise-induced asthma in a group of children on asthma registers in general practice, the sports that were affected and the medication that the children took.

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Method

In this study an asthmatic was defined as a child (aged eight to 16 years) who had been diagnosed as suffering from asthma and who had needed treatment during the 12 months prior to the start of the study. As there were not enough suitable asthmatics in the author's practice, six neighbouring practices contributed children from their asthma registers. These did not comprise all the asthmatics in a practice, but they probably had a more severe problem because those who have frequent contact with a doctor are more likely to be put on a register. One hundred and twenty four children were selected.

A self-administered questionnaire was sent to the children's parents (Coughlin SP. MMedSc thesis, University of Leeds, 1986). Questions were framed to provide data on the severity of asthma, the prevalence of exercise-induced asthma and its management and prevention, the range of sport attempted, as well as problems encountered with sport. Owing to doubts about the ability of the children, particularly the youngest, to produce reliable responses, parents were asked to supervise the completion of the questionnaire.

Results

Of the 111 children (90%) who replied to the questionnaire 74 were boys and 37 were girls. This 2:1 sex ratio of asthmatics is a well known feature for this age group.[6,11] All ages between eight and 16 years were represented.

When asked about the frequency of attacks three boys and one girl denied having asthma. One boy only partially completed his questionnaire. Just over a quarter of those who admitted to having asthma (29 out of 106) reported frequent attacks (more than once a week) and were defined as severe asthmatics. The remaining 77 children had mild asthma, with less than one attack per week or no attacks in the last month.

Nevertheless exercise-induced asthma was common, only 26% reporting that they rarely or never experienced it (Table 1). Twenty eight out of the 29 severe asthmatics reported getting attacks during exercise, but it also occurred among the milder asthmatics (69 out of 82) (Table 1). Exercise-induced asthma was also reported during swimming, a sport which asthmatics are supposed to tolerate well. However, here it was less common and irritant fumes may have been contributory.

Of the 97 children who had experienced exercise-induced asthma, 43 (44%) indicated that their asthma had in the past

Table 1. Frequency of occurrence of exercise-induced asthma during sport and exercise in general and during swimming for 111 asthmatic children.

	Number (%) experiencing exercise-induced asthma					
	During sport and exercise					
Frequency of exercise-induced asthma	All asthmatics ($n=111$)		Severe asthmatics ($n=29$)		During swimming ($n=111$)	
Often	37	*(33)*	17	*(59)*	3	*(3)*
Sometimes	46	*(41)*	11	*(38)*	23	*(21)*
Rarely	14	*(13)*	0	*(0)*	28	*(25)*
Never	14	*(13)*	1	*(3)*	57	*(51)*

Table 2. Disruption of sporting activities for 97 children with exercise-induced asthma according to frequency of attacks.

Frequency of exercise-induced asthma	Number (%) of children		
	Ever having to miss sport because of asthma ($n=43$)	Ever advised to avoid sport because of asthma ($n=24$)	Ever unable to complete a sports lesson because of asthma ($n=28$)
Often	22 *(51)*	15 *(63)*	19 *(68)*
Sometimes	18 *(42)*	8 *(33)*	9 *(32)*
Rarely	3 *(7)*	1 *(4)*	0 *(0)*

caused them to miss taking part in sport (Table 2). This did not usually happen frequently, only six reporting that it occurred weekly, 13 at least once a month and the rest less often. The trend suggested an association with frequent exercise-induced asthma although it was not statistically significant.

Twenty-four children had actually been advised to avoid certain sports (Table 2) of which running, particularly cross-country, was the most common (10 children mentioned this). Four children had been advised to avoid physical education at school and one had been told to avoid all exertional sport. The source of advice was roughly equally divided between parents (mentioned 11 times), teachers (eight times) and doctors (nine times) with advice sometimes coming from more than one source. Here the association with frequency of exercise-induced asthma was significant ($P<0.05$) (Table 2).

All children were asked about sport at school. Having to give up during a lesson or game was not uncommon (Table 2) and the association with frequent exercise-induced asthma was again significant ($P<0.001$). However, only four of these children reported that this happened often. Running was again prominent but stop–start games such as soccer, rugby, netball and hockey and, surprisingly, swimming also gave rise to difficulty (Figure 1).

Almost all of the 111 asthmatic children (105) were receiving medication, which for the majority (98) included a bronchodilator. Yet only just over half of those who had exercise-induced asthma (57 out of 97) used a bronchodilator drug to abolish the symptoms (Table 3). Even fewer (43 out of 97) took adequate prophylactic measures (that is, using a bronchodilator and/or sodium cromoglycate) before participating in exercise (Table 3). This under-treatment was not confined to those having little trouble with exercise; of the 16 children who reported both having to miss sport and give up occasionally during games because of asthma, only 12 used a bronchodilator for symptomatic relief and seven used adequate prophylaxis.

Table 3. Use of bronchodilator drugs or prophylactic measures for 97 children with exercise-induced asthma according to frequency of attacks.

Frequency of exercise-induced asthma	Number (%) of children	
	Using a bronchodilator for symptoms	Using measures to prevent symptoms
Often ($n=37$)	25 *(68)*	19 *(51)*
Sometimes ($n=46$)	26 *(57)*	21 *(46)*
Rarely ($n=14$)	6 *(43)*	3 *(21)*
Total ($n=97$)	57 *(59)*	43 *(44)*

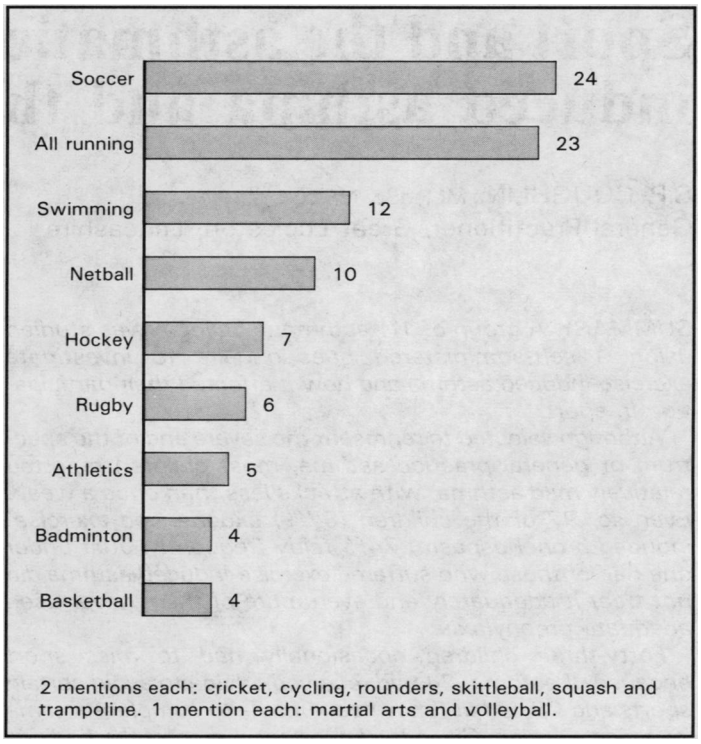

Figure 1. *Sports which have caused the asthmatic child to give up during a game; figures show number of times mentioned.*

Discussion

The sample was selected to be representative of the more severe end of the spectrum of asthma seen in general practice. However, three-quarters of the children reported only infrequent attacks (less than one per week) and are best defined as mild asthmatics.

Nevertheless mild as well as severe asthmatics suffered from exercise-induced asthma and this led to problems with sport. To some extent the frequency of reporting will be determined by the frequency with which a child takes part in a particular sport and also on his or her ability to avoid troublesome sports. It is not surprising, therefore, that they should sometimes be advised to avoid sports, although the circumstances and appropriateness of this advice were not discernible from this study. Given the social and physical benefits of sport in this age group the results suggest that asthma can be a real handicap.

In spite of their problems the asthmatic children attempted a wide variety of sports both at school and in sports clubs. Many recorded successes either in individual competition or as a member of a team. We know that asthmatics can be successful at the highest levels, as demonstrated by several well known athletes, cricketers and swimmers. Doctors need to be aware of the potential of asthma to disrupt sporting activities and act accordingly, as the appropriate use of bronchodilators and sodium cromoglycate can enable children to overcome this handicap.

All but five children were receiving drug therapy but whether each child was receiving an optimally effective combination is not known. In any case, a substantial number of children were not adequately treating attacks of exercise-induced asthma or using prophylaxis. Whether they do not like to use inhalers, cannot be bothered to do so, or actually do not know what to do is not clear. The last of these would have important implications for the general practitioner in patient education, and the under-treatment reported in this study, together with the frequency of exercise-induced asthma, should perhaps receive more attention.

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