efficient early warning system for asthmatic patients and those treating them.

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Asthma in runners

EDITOR,—Larrson *et al* reported that out of 42 Swedish élite cross country skiers, 23 had asthma and 31 asthma-like symptoms.[1] In 1984, 11·2% of the athletes in the United States' Olympic team had asthma induced by exercise.[2] Thus, in élite athletes and especially in skiers symptoms of exercise induced asthma are common.[1] Running is the most effective way to provoke such asthma,[3] and bronchoconstriction in connection with exercise is exacerbated by inhalation of cold dry air or allergens.[4,5] However, exercise induced asthma has not yet been thoroughly studied in runners. During winter in countries with four distinct seasons runners train outdoors in cold temperatures or indoors, where air quality may be poor. During spring and summer they are exposed to many pollen allergens.

We studied the occurrence of asthma, asthma-like symptoms, and allergy in élite athletes. Volunteer subjects were 103 runners from the Finnish adult and junior national teams. Their main event ranged from the 400 m to the marathon, and they had run a mean distance in training in the previous year of 4140 km (range 1500-8500 km). Their mean age was 22·9 (SD5·5) years, and they had been active competitors for a mean of 9·3 (4·5) years. They completed questionnaires about allergies, asthma, and asthma-like symptoms connected with exercise (cough, breathlessness, or wheeze) and their relation to training and environmental conditions.

Sixteen of the runners had asthma documented by a physician. Twenty four of the 87 remaining runners (28%) had allergies. All 16 runners with asthma and 14 of the 24 runners with allergies (58%) reported having symptoms like exercise induced asthma. However, 23 of the 63 runners without asthma or allergies (37%) reported having such symptoms occasionally. Thus asthma-like symptoms were strongly associated with allergies as 75% (30/40) of the runners with allergies had symptoms compared with 37% (23/63) of the runners without allergies (χ^2 test, $P<0·01$). Indoor training caused symptoms like exercise induced asthma in 41 of the 103 runners (40%), and outdoor training in cold air caused such symptoms in 31 (30%).

Asthma and symptoms like exercise induced asthma adversely affect not only cross country skiers[1] but also middle and long distance runners, with over half of the runners in our study (52% (53/103)) being affected. In countries with four distinct seasons the circumstances of training may stress the airway mucous membranes to induce exercise induced asthma and symptoms like it in élite athletes, who use large ventilation volumes and train intensively all year round. In runners cold weather may be a minor problem, but allergy and exposure to aeroallergens during the pollen season in spring and indoor training in winter may be important factors in provoking asthma-like symptoms.

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Serum C4 concentration and risk of atherosclerosis

EDITOR,—Judit Kramer and colleagues report a high prevalence of the C4B*Q0 allotype in patients with myocardial infarction.[1] Muscari *et al* showed a significant assocation between serum C4 concentrations and the presence of severe atherosclerosis.[2] We have studied, in our paediatric lipid research clinic, 243 children aged 2·0 to 15·9 years. We determined serum C4 concentrations in 107 children from 79 families who were referred to our clinic from 1990 to 1992 because serum total cholesterol concentrations exceeded the 75th centile for local data (5·17 mmol/l)[3] in at least one child. At the time of diagnosis we analysed the serum lipoprotein profile and C4 fraction with commercially available kits.

The children were divided into three age groups: 2·0-6·9, 7·0-10·9, and 11·0-15·9 years. They were also divided according to atherosclerotic risk, which depended on their concentration of low density lipoprotein cholesterol in comparison with values obtained in the healthy Spanish population[3]: normal risk (values between the 5th and 75th centiles (1·29 and 3·23 mmol/l)); moderate risk (values between the 75th and 95th centiles (3·23 and 3·88 mmol/l)); and high risk (values above the 95th centile (3·88 mmol/l)). Two way analysis of variance with sex and age groups as dependent variables showed a significant effect only for sex. Comparisons between low density lipoprotein cholesterol groups were made by one way analysis of variance (Fisher's test); post hoc testing was done with Scheffe's S test.

We observed significant differences between boys in the high risk group and those in the two other groups (table). The relation between serum C4 concentrations and the risk of atherosclerosis agrees with that previously reported in adults.[2] Despite the high degree of variability in the expression of C4 genes in normal subjects,[4] the association between serum concentrations of C4 or its isotypes and atherosclerosis could be related to the C4B*Q0 allotype. From our data we conclude that monitoring of the C4 fraction and other atherosclerotic risk factors[5] could be useful in diagnosing and evaluating the atherosclerotic process. Now we must investigate the precise relation between all these findings and the pathogenic sequence of the formation of atherosclerotic plaques, which begins in childhood.

Serum C4 concentration (g/l) in children according to risk of atherosclerosis

	Normal risk	Moderate risk	High risk
Boys:			
No	24	14	19
Mean (SD)	0·19 (0·05)	0·18 (0·04)	0·23* (0·08)
Girls:			
No	17	14	19
Mean (SD)	0·18 (0·04)	0·18 (0·06)	0·17 (0·04)

*Boys at high risk *v* boys at normal risk, $P<0·05$; boys at high risk *v* boys at moderate risk, $P<0·05$.

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Emergency transport for neonates after home deliveries

Expectations of flying squads are too high

EDITOR,—Northern region has had a centralised neonatal flying squad for many years, but we agree with Carol Sullivan and colleagues that the title is misleading.[1] It causes confusion and results in an instant response being expected. Such a response has become impossible with the reduction in junior doctors' hours and has always been problematic if the squad is already attending a call.

Community midwives may well have the expectations outlined by the authors,[1] and these should be dispelled. A neonatal flying squad could never, however, react sufficiently quickly to fulfil a primary role in neonatal resuscitation. Northumbria ambulance authority has one of the best response times but would not be able to move a squad from hospital to a patient at home in less than 15 minutes from receipt of a call. In the few cases in which neonatal resuscitation is required[2] it is needed in the first minutes after delivery. Therefore establishing a separately funded flying squad is an inadequate solution. An alternative is to improve the training of the people who deliver babies in the community. If we are able to train