

Trends in prevalence of asthma and allergy in Finnish young men: nationwide study, 1966-2003

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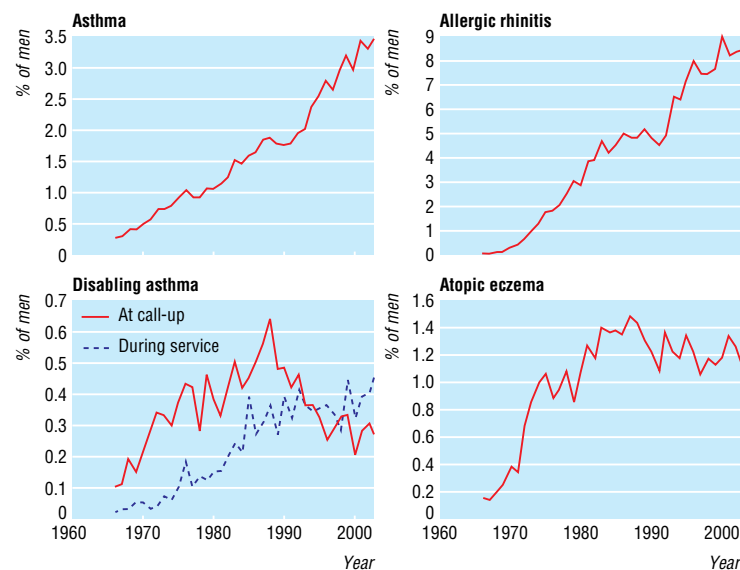
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Recent reports on time trends in atopic disease suggest that the prevalence of asthma and allergic rhinitis has levelled off in some European countries after several decades of increasing.^{1,2} We reported earlier that the prevalence of asthma in young Finnish men remained stable from 1926 to 1961 but started to rise steeply during the 1960s; a sixfold, virtually linear increase in asthma prevalence was found between 1966 and 1989, in parallel with increases in indicators of disabling asthma (on the basis of the percentage of men exempted from military service at call-up owing to asthma and of men discharged during service as a result of asthma).³ We examined whether similar trends have continued during the subsequent 13 years (1990-2003). As data on current trends in prevalence of allergic conditions are scarce, we also examined the trends in prevalence of allergic rhinitis and eczema from 1966 to 2003 among these young men.

Methods and results

In Finland, about 98% of all men aged 18-19 are examined to establish their fitness for military service. Diagnostic codes (based on the international classification of diseases) are registered. During 1966-2003 almost 1.4 million men were examined. The examination procedure has been described earlier.³ Since 1972 the examination has been a two stage procedure: a clinical examination (including medical history and a questionnaire) by a local general practitioner followed by a re-examination at call-up by an army physician. Specialists are consulted when needed.



Prevalence of asthma, allergic rhinitis, and atopic eczema in young Finnish men during 1966-2003 at examination at call-up for military service, and prevalence of disabling asthma as percentage of men exempted at call-up owing to asthma or as percentage of men (of all those who started their service in each year) discharged during service as a result of asthma

What is already known on this topic

The prevalence of asthma and allergic rhinitis has levelled off in some European countries after several decades of increasing

The increase in the prevalence of asthma in Finland has been nearly linear since the 1960s

What this study adds

No signs of a reduction in the prevalence of asthma and allergic rhinitis in young Finnish men by 2003 were found, although asthma seems to have become milder and better controlled during the past 13 years

The figure shows the prevalence trends for asthma, rhinitis, and eczema. We found that the prevalence of asthma increased 12-fold between 1966 (0.29%) and 2003 (3.45%), showing a continuous rising trend during this period. The average annual increment in prevalence during this period was 0.1%. By contrast, the trends for indicators of disabling asthma turned downwards in 1989. Since then, the percentage of men exempted at call-up owing to asthma has continued to decrease, whereas the percentage of men discharged during service as a result of asthma started to rise again in 1998. Prevalence of allergic rhinitis remained low (< 0.1%) till 1970 but increased steadily thereafter. The rise in prevalence of allergic rhinitis has been particularly striking since 1991, with the peak in 2000 (8.9%), and the trend is still upwards. Prevalence of atopic eczema, however, has remained fairly constant (about 1.2%) since the early 1980s.

Comment

By the year 2003, no signs of a reduction in the prevalence of asthma and allergic rhinitis in young Finnish men were found in this study, which included a very large dataset of homogeneous populations with a participation rate of about 98% throughout and a high number of repeated surveys. For asthma and allergic rhinitis, the results are similar to those reported recently from Sweden⁴ but discordant with findings from several other European countries.^{1,2} Some environmental factors may still continue to induce disease in susceptible individuals in Sweden and Finland, whereas in several European countries the process may have come to an end.

Asthma has become milder or better controlled, or both, during the past 15 years, as the percentage of men exempted from military service at call-up owing to asthma has shown a downward trend. Implementa-

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tion of the national and global asthma prevention programmes that have led to improved asthma management are thought to be involved in this change⁵; the impact of other (environmental) factors is more difficult to evaluate. A similar steadily decreasing trend was not found, however, in the percentage of men discharged during service as a result of asthma, which points to a need to re-examine selection and classification criteria for asthmatic men at call-up, as well as to better treatment during service.

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Changes in atopy over a quarter of a century, based on cross sectional data at three time periods

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Evidence that the prevalence of atopic diseases, including asthma and hay fever, has increased over the past 20-30 years comes mainly from questionnaire based surveys; objective measurements are limited.¹⁻⁴ We therefore measured serological markers of atopic sensitisation in stored serum samples that had been collected from a population of men over about 25 years.

Participants, methods, and results

We used frozen (-40°C) serum samples from men aged 40-64 years who had attended the British United Provident Association (BUPA) Medical Centre, London, for a routine medical examination. An advantage of this cohort is its socioeconomic homogeneity—almost all were professionals or businessmen. We matched (by age and month of attendance) the 513 samples from men who attended during 1996-8 to samples from 513 men seen in 1981-2 and 513 seen in 1975-6. The serum samples had not previously been thawed; previous work has shown negligible decay in IgE during storage of serum.⁵

We first tested the samples using Phadiatop (Pharmacia & Upjohn), a standard qualitative serological marker of atopy based on a mixture of 11 common, inhaled allergens (grass, tree, nettle, mugwort, mould, and olive; cat, dog, and horse dander; and two house dust mites). The positive samples were then tested for specific IgE to grass (timothy grass), tree mix (elder, silver birch, hazel, oak, and plane), and cat dander (Pharmacia CAP system); we did not test the Phadiatop negative samples because Phadiatop includes all these allergens. The samples were also tested for IgG antibody to hepatitis A (DiaSorin) and to *Helicobacter pylori* (samples from 1996-8 only; Axis-Shield Diagnostics).

The table shows that we found highly significant increases over time in the proportion of men positive to Phadiatop and with specific IgE to the three inhaled allergens. The average rate of increase was equivalent to an additional 4.5% of men becoming Phadiatop positive each decade.

We compared the data on men born in 1932-42 who had had serum taken in the earlier periods (1975-6 or 1981-2, at age 40-50) and on men born in the same years (1932-42) who had had serum taken in the later period (1996-8, at age 54-64). The proportions of samples positive to Phadiatop were similar for both the earlier and later periods (35% and 34% respectively). The proportions of samples positive for specific IgE to grass, tree, and cat dander were also similar for the two time periods. In multiple regression, year of birth was associated with the prevalence of atopy ($P < 0.001$), but current age was not.

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What is already known on this topic

The prevalence of atopic diseases is increasing

Cross sectional studies show that the prevalence of atopy decreases with increasing age

What this study adds

Serological measurements at three time periods provide objective evidence that earlier birth cohorts were less likely to have become atopic than more recent ones; this accounts for the apparent decreasing prevalence of atopy with age

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