The epidemiology of allergic sensitization and the relation to asthma and rhinitis

The Obstructive Lung Disease in Northern Sweden (OLIN) Studies, Thesis XIV

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Akademisk avhandling

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Köpenhamn, Danmark.
This thesis is focused on prevalence, incidence and remission of allergic sensitization to airborne allergens among adolescents and adults. Associated risk factors and the relation of allergic sensitization to asthma and rhinitis were also assessed. **Methods:** A cohort study of children aged 7-8 years (n=2148) were followed to age 19 y. An adult cohort, 20-69 y at recruitment in 1994 (n=664) was followed up in 2004 (n=555). Trends in prevalence of allergic sensitization were assessed by comparing two cross-sectional studies; the cohort from 1994 and another sample examined in 2009 (n=737). The relation of allergic sensitization to asthma and rhinitis was determined in the adult cohort in 2009. Allergic sensitization was assessed by skin prick test (SPT) in ages ≤ 60 y. Specific IgE was analyzed in the adult cohorts in 2004 and 2009. Data regarding risk factors, respiratory disease and symptoms were assessed by parental questionnaires and by structured interviews among the adults. **Results:** The 10-year cumulative incidence of allergic sensitization among adults was 5%, while remission was 32%. The prevalence of allergic sensitization was highest among adults aged 20-29 y, 55% to 61%, and decreased with increasing age. Among children and adolescents, both incidence and persistence of allergic sensitization was high, and the prevalence of allergic sensitization increased from 21% at age 7-8 y to 42% at age 19 y. Multisensitization was strongly associated with early onset of sensitization. The prevalence of sensitization to the major specific allergens birch, timothy cat and dog as well as multisensitization increased significantly from 1994 to 2009. Sensitization to any allergen increased from 35% to 39%, however not significantly. A family history of allergy was significantly associated with allergic sensitization in all ages. Male sex and urban living were significantly positively, and birth order and furry animals at home in childhood were negatively associated with onset of sensitization before the age of 7-8 y, but not with onset during adolescence. Young age and urban living were significant risk factors in adult age. Sensitization to any animal was significantly associated with current asthma (OR 4.80), whereas sensitization to any pollen (OR 4.25) and any animal (OR 3.90) were associated with current allergic rhinitis. The association between allergic sensitization and allergic rhinitis was strongest in young adult age and decreased with increasing age. Among asthmatics, the prevalence of allergic sensitization decreased with increasing age of asthma onset. **Conclusion:** Both incidence and persistence of allergic sensitization was high among children and adolescents explaining the increasing prevalence by age. Among adults, an inverse pattern with low incidence and high remission of allergic sensitization was seen, why the decrease in prevalence of allergic sensitization by increasing adult age might partly be explained by normal ageing. The increase in prevalence of sensitization to the specific allergens explained the significant increase in multi-sensitization over 15 years. A family history of allergy was consistently associated with allergic sensitization in all ages. The prevalence of allergic sensitization decreased with increasing age of asthma onset among adult asthmatics.

**Keywords**
Adolescence, adults, allergic rhinitis, allergic sensitization, asthma, childhood, epidemiology, specific IgE

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