

Cohort study

Prenatal and postnatal exposure to parental smoking increases odds of allergic diseases during childhood and adolescence

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Context

Secondhand tobacco smoke (SHS) exposure has been proposed to be a risk factor for allergic diseases. Some studies have suggested that SHS exposure during pregnancy and infancy¹ may be associated with allergic diseases during childhood, including asthma, rhinitis and atopic dermatitis. However, in Sweden some studies have found no increased chance of developing allergic diseases in children with smoking parents. It is unknown that how early SHS exposure may impact adolescents. In this study, the authors sought to use a large birth cohort to further evaluate the relationship between SHS and specific allergic diseases, as well as the relationship between the timing of SHS exposure and of the appearance of allergic disease in children and adolescents.

Methods

A Swedish birth cohort of 4089 children was followed for 16 years to explore the association between parental smoking and the development of child allergic disease. As BAMSE (Swedish abbreviation for Children, Allergy, Milieu, Stockholm, Epidemiological survey) provides data up to the age of 16, the impact of parental smoking on allergic diseases during adolescence could be explored.

Findings

Prenatal exposure to parental smoking was associated with an increased chance of developing asthma up to 16 years (OR=1.45; 95% CI 1.15 to 1.83), but not rhinitis or atopic dermatitis. Asthma, rhinitis and atopic dermatitis increased in children up to 16 years who had been exposed to SHS during infancy (asthma OR=1.23; 95% CI 1.01 to 1.51, rhinitis

OR=1.18; 95% CI 1.01 to 1.39 and eczema OR=1.26; 95% CI 1.09 to 1.45). Asthma and rhinitis due to SHS mostly occurred during early childhood, but atopic dermatitis occurred later in childhood. Furthermore, the study suggested that the effect of SHS on asthma was most prominent during pregnancy, whereas the effect of childhood exposure to SHS was important for rhinitis and atopic dermatitis. The effects on rhinitis and atopic dermatitis seemed to be dose dependent.

Commentary

This use of a large birth cohort provides a unique opportunity to assess the development and timing of asthma, rhinitis and atopic dermatitis, and the relationship to SHS exposure during pregnancy and childhood. For the first time, a long-term effect of SHS on allergic outcomes in adolescence has been shown. BAMSE has the strength of being a large, well-designed cohort with limited drop out, providing assessment of allergic disease status at different ages. Data regarding smoking had been assessed before potential health outcomes could have occurred which minimises the risk of recall bias. However, disease status and SHS have been assessed via questionnaire and an under assessment of SHS might have occurred. However, this would have biased the results towards the null and it is notable that a significant relationship between SHS and allergic disease is still observed.

This study provides additional evidence of the negative health impact of both prenatal and childhood exposure to environmental tobacco smoke. Early SHS exposure, in utero or during infancy, is significantly associated with the development of asthma and rhinitis in early childhood and the development of eczema later during childhood. The temporal relationship and the dose-response relationship, particularly in the smoking/asthma association, suggest a causal association. The study provides evidence that should support decision makers to continue with antismoking programmes.

These results highlight the importance of conducting well-designed, large cohort studies with long-term follow-up to answer questions which otherwise remain unsolved. Owing to the study design, relationships could be seen where shorter studies have not found associations.

Implications for practice

This study provides further evidence of the harm of prenatal and early childhood exposure to SHS. Providers should encourage families to avoid smoking during pregnancy and childhood, and policymakers should continue smoking bans in public places.

Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.

Reference

1. Mitchell EA, Beasley R, Keil U, *et al.*, ISAAC Phase Three Study Group. The association between tobacco and the risk of asthma, rhinoconjunctivitis and eczema in children and adolescents: analyses from phase three of the ISAAC programme. *Thorax* 2012;67:941–9.