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Parental smoking and allergic sensitisation in children

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Abstract

***Background* – A systematic review was conducted of the effects of parental smoking on immunoglobulin (IgE) levels, skin prick positivity, and allergic rhinitis or eczema in children. Asthma was excluded in order to distinguish more clearly the effect of passive smoke exposure on allergic sensitisation.**

***Methods* – Thirty six relevant publications were identified after consideration of 692 articles selected by electronic search of the Embase and Medline databases using keywords relevant to passive smoking in children. The search was completed in April 1997 and identified nine studies of IgE in neonates, eight of IgE in older children, 12 which included skin prick tests, and 10 describing symptoms of allergic disease other than asthma or wheezing. A quantitative meta-analysis was possible only for the studies reporting skin prick tests.**

***Results* – Several large studies failed to confirm early reports of a substantial or statistically significant association of maternal smoking with concentrations of total serum IgE in neonates or in older children. No consistent association emerged between parental smoking and allergic rhinitis or eczema. Few of these studies adjusted for potential confounding variables. The quantity and quality of evidence was greatest for skin prick tests, and studies of parental smoking during pregnancy or infancy were broadly consistent in showing no adverse effect on prick positivity (pooled odds ratio 0.87, 95% confidence interval 0.62 to 1.24). There was much greater and statistically significant ($p = 0.002$) heterogeneity of odds ratios relating current parental smoking to skin prick positivity.**

***Conclusions* – Parental smoking, either before or immediately after birth, is unlikely to increase the risk of allergic sensitisation in children.**

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Keywords: parental smoking, allergic sensitisation, children.

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Active smoking is associated with an increase in total serum immunoglobulin E (IgE) concentrations[1] and an elevated risk of allergic sensitisation to some, but not all, occupational allergens.[2–4] The suggestion that passive exposure to tobacco smoke might influence allergic sensitisation in children was first made in 1981[5] and subsequently a number of studies have investigated the relationship of parental smoking to IgE concentrations in cord blood, total and allergen specific IgE levels later in childhood, positive skin prick reactions to common aeroallergens, and allergic symptoms. This paper systematically reviews the evidence relating to IgE levels, skin prick tests, and allergic rhinitis. The larger number of studies relating parental smoking to the development of asthma will be reviewed separately.

Methods

Published papers, letters and review articles were selected by an electronic search of the Embase and Medline databases using the search strategy described in detail elsewhere.[6] Briefly, all passive smoking references were selected by the MESH heading *tobacco smoke pollution* and/or textword combinations ({*passive, second-hand, second hand, involuntary, parent*, maternal, mother*, paternal, father** or *household*} and {*smok*, tobacco** or *cigarette**}). Papers were then restricted to children by relevant textwords or by the age group as specified in the title or abstract. This search, completed in April 1997, yielded 3625 references of which 1593 contained keywords relevant to respiratory or allergic disease. These 1593 abstracts were reviewed and papers relevant to allergy were selected by the textwords *globulin E, IgE, atopic, atopy, allergy* or *skin prick*. Papers relating solely to asthma or wheezing illness were excluded by review of the on-line abstracts. Thirty four publications included quantitative information relevant to this review and a further two were identified by citations in the studies reviewed. The 36 papers described the results of 23 cross-sectional surveys, two case-control studies, eight longitudinal studies, and three controlled trials of intervention in high-risk families (table 1).

Studies were grouped according to the outcome measure as follows: IgE in neonates (nine studies), IgE in older children (eight studies), skin prick tests (12 studies), and symptoms of