

Prevalence of latex allergy in the community at age 7 years

G. Roberts*, G. Lack*, K. Northstone†, J. Golding† and the ALSPAC Study Team

*Paediatric Allergy, Asthma and Immunology, Imperial College at St Mary's, London, UK and †Unit of Paediatric and Perinatal Epidemiology, University of Bristol, Bristol, UK

Summary

Background Latex allergy has been highlighted as a problem in children during the last decade based on a number of case series of children with particular problems such as spina bifida. The actual prevalence of latex allergy in the general United Kingdom population is unclear.

Objective To estimate the prevalence of childhood latex allergy in the general population.

Methods The Avon Longitudinal Study of Parents and Children is a geographically based cohort that has been prospectively followed since birth. The children were invited for skin prick testing at 7 years of age.

Results Four subjects out of 1877 tested were sensitized to latex. None had a history of clinical reactions to latex.

Conclusion This study suggests that the prevalence of latex sensitization and clinical latex allergy in the general childhood population are very low, 0.2% (95% confidence interval 0.1–0.6%) and 0.0% (0–0.2%), respectively.

Keywords children, Latex allergy, population-based cohort study

Submitted 9 June 2004; revised 7 October 2004; accepted 24 November 2004

Introduction

Latex allergy has been highlighted as a problem in paediatric practice during the last decade [1]. Many case series have been presented that highlight the problem in particular paediatric populations, for example, allergic children [2], children with spina bifida [3] and those undergoing frequent operative procedures [4]. However, it is currently unclear to what extent latex allergy is a problem in the general paediatric population because of paucity of population-based studies of its prevalence. Only one study has addressed this question in a population-based cohort [5]. It suggested that the prevalence of sensitization in Italian school children aged 9 years is 0.7%; no subjects in that study reported any clinical allergy.

Methods

Subjects were recruited from the Avon Longitudinal Study of Parents and Children (ALSPAC), a prospective birth cohort of all babies with an expected delivery date between 1st April 1991 and 31st December 1992 (www.alspac.bris.ac.uk). All were born in Avon, a district that is mainly suburban. A total of 14 541 pregnant women were recruited with 13 971 surviving offspring. The children taking part in the study were invited with their parents to the 'Focus @ 7' clinic

during the period September 1998–2000. The clinic comprised a rotation of eight 20 min slots, of which one was devoted to skin prick testing. Subjects were tested to mixed grass pollen, *Dermatophagoides pteronyssinus*, cat, peanut, mixed tree nuts, egg, positive control (histamine, 10 mg/mL) and negative control (ALK-Abello, Horsholm, Denmark) at age 7 years. The cohort was also tested to one of three other allergen panels, one of which contained latex. Each panel was rotated on a weekly basis. Sensitization was defined as a 3 mm or greater weal in the presence of a valid (≥ 3 mm) positive and negative (0 mm) control. All subjects with a 2 mm or greater weal to latex were asked via telephone about any symptoms of clinical allergy to latex. The ALSPAC cohort study receives ethical surveillance from the four local ethics committees (United Bristol Hospital Trust, Southmead, Frenchay and Weston Super Mare) as well as its own independent committee 'The ALSPAC Ethics and Law Advisory Committee'. All families gave informed, written consent for skin prick testing.

Results

A total of 7249 (51.8%) of the cohort were skin tested and 1877 had a valid skin test to latex. Subjects who were not skin tested were similar in terms of personal history of eczema or wheeze and maternal history of eczema, hayfever or asthma to those who underwent testing. A total of four subjects had evidence of sensitization to latex. Their mean weal diameter was 3.5 mm (range 3 to 5 mm). An additional nine subjects had 1 or 2 mm weals. This suggests that the prevalence of

Correspondence: Dr Graham Roberts, Paediatric Allergy and Respiratory Medicine (Mail point 803), Southampton University Hospital Trust, Tremona Road, Southampton SO16 6YD, UK.

E-mail: g.c.roberts@soton.ac.uk

sensitization (≥ 3 mm weal) in the general paediatric population is 0.2% (95% confidence interval (CI) 0.1–0.6). Three of the four subjects sensitized to latex were additionally sensitized to at least one other allergen. These included cat, grass or tree pollens, house dust mite, moulds, peanut or tree nuts. Subjects sensitized to latex were 4.64 (95% CI 2.61–8.26) times more likely to be sensitized to one or more of mixed grass pollen, *D. pteronyssinus*, cat, peanut, mixed tree nuts or egg. None of the subjects with a 2 mm or greater weal to latex had any history of a reacting to latex. For example, none had problems at the dentist or when handling balloons. Similarly, none had a history of reacting to fruit. This suggests that the prevalence of latex allergy in young school age children is ≤ 2 per 1000 (95% CI 0–0.2%).

Discussion

The data presented demonstrate that sensitization and clinical allergy to latex are very rare in the general childhood population. The prevalence of sensitization in Italian children was reported as 0.7% but these children were slightly older and sensitization was defined as a weal of 2 mm or greater [5]. If this definition was applied to our population, a prevalence of 0.5% (95% CI 0.2–0.9%) would have been recorded. Only 7841 (56.0%) subjects from this large birth cohort were assessed at the 7-year clinic. This may be seen as a limitation but 92.4% of those seen were skin tested and none refused testing because of concerns about latex allergy. Additionally there were no significant differences between subjects who were and were not skin tested at aged 7 years. For these reasons it is unlikely that our results have been affected by a selection bias.

We chose to identify subjects who were potentially latex allergic on the basis of a skin prick test to a standardized commercial latex extract [1]. Latex sensitization can also be demonstrated with specific IgE testing but this has a lower specificity because of cross-reactivity with common allergens like timothy grass and mugwort [6, 7]. No sensitized individual reported any symptoms to exposures such as dental examinations or balloons. As such exposure is almost universal by 7 years of age, we can be reasonably certain that clinical allergy to latex is very rare in the general childhood population. Nevertheless, it is still important to consider latex allergy as a possibility in particular special populations [2–4]. Interestingly our data suggests that atopy is a risk factor for

sensitization to latex. Additionally, there is a need for data on the prevalence of latex allergy in teenagers as these sensitized children may develop a clinical allergy in later life.

Acknowledgements

We are extremely grateful to all the mothers who took part and to the midwives for their cooperation and help in recruitment. The whole ALSPAC Study Team comprises interviewers, computer technicians, laboratory technicians, clerical workers, research scientists, volunteers and managers who continue to make the study possible. This study could not have been undertaken without the financial support of the Medical Research Council, the Wellcome Trust, UK government departments, medical charities and others. This particular analysis was funded by the British Lung Foundation and the Food Standards Agency (project T07001). The ALSPAC study is part of the WHO initiated European Longitudinal Study of Pregnancy & Childhood.

References

- 1 Cullinan P, Brown R, Field A et al. British society of allergy and clinical immunology. Latex allergy. A position paper of the British society of allergy and clinical immunology. *Clin Exp Allergy* 2003; 33:1484–99.
- 2 Novembre E, Bernardini R, Brizzi I et al. The prevalence of latex allergy in children seen in a university hospital allergy clinic. *Allergy* 1997; 52:101–5.
- 3 Cremer R, Hoppe A, Kleine-Diepenbruck U, Blaker F. Longitudinal study on latex sensitization in children with spina bifida. *Pediatr Allergy Immunol* 1998; 9:40–3.
- 4 Hourihane JO, Allard JM, Wade AM, McEwan AI, Strobel S. Impact of repeated surgical procedures on the incidence and prevalence of latex allergy: a prospective study of 1263 children. *J Pediatr* 2002; 140:479–82.
- 5 Bernardini R, Novembre E, Ingargiola A et al. Prevalence and risk factors of latex sensitization in an unselected pediatric population. *J Allergy Clin Immunol* 1998; 101:621–5.
- 6 Fuchs T, Spitzauer S, Vente C et al. Natural latex, grass pollen, and weed pollen share IgE epitopes. *J Allergy Clin Immunol* 1997; 100:356–64.
- 7 Pridgeon C, Wild G, Ashworth F, Egner W, Ward AM. Assessment of latex allergy in a healthcare population: are the available tests valid? *Clin Exp Allergy* 2000; 30:1444–9.