

Latex allergy in children with no known risk factor for latex sensitization

Sorva R, Mäkinen-Kiljunen S, Suvilehto K, Juntunen-Backman K, Haahtela T. Latex allergy in children with no known risk factor for latex sensitization.

Pediatr Allergy Immunol 1995; 6: 36–38. © Munksgaard 1995.

We describe latex allergy in 11 atopic children, aged 0.7–11.1 years, without any known risk factor. A skin prick-test (SPT) for latex was positive in 8/11, and latex specific IgE was found in all. Latex glove challenge was positive in 9 assessed. These patients demonstrate that latex allergy should be looked for not only in children who have had several operations or those children reporting symptoms from rubber, but also in children with severe atopic eczema, banana allergy, or urticaria or anaphylaxis for which the cause is unknown.

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Key words: latex allergy; natural rubber allergy;
children

Received January 17, 1994

Accepted March 26, 1994

In adults, type I latex allergy may manifest as contact urticaria, rhinitis, asthma, or even as anaphylaxis intraoperatively or during radiological examinations involving the use of rubber devices (1). Most cases of latex allergy in children have been reported after multiple operations on patients with several anomalies, especially spina bifida (1). Axelsson et al. (2) reported 3 cases of latex allergy and symptoms due to rubber balloons and/or a rubber dental cofferdam. We have previously reported 3 infants who had symptoms from dummies and teats made of natural rubber (3). We here describe latex allergy in 8 other children without any known risk factor.

Methods

Clinical material

The children were patients at the Department of Allergic Diseases of Helsinki University Central Hospital (Table). Three of them have been described previously (Patients 1, 2, 4) (3). Latex allergy was primarily suspected by the parents only in 3 of the 11 children; Patients 6, 7 and 8 had facial symptoms from rubber balloons.

Six children, Patients 1, 2, 4, 5, 9 and 11, were tested for latex allergy because of atopic eczema resistant to treatment. Patients 1, 2 and 4 were continuously using rubber dummies. Patient 5 had no recent contact with latex products, but had earlier used rubber dummies. He had had recurrent anaphylactic reactions (facial oedema, urticaria, and asthma) for 4 years before the diagnosis was made,

when he presented with facial oedema that appeared when he blew a rubber balloon. He had been operated on twice for inguinal hernia. Patient 9 had symptoms while continuously handling and playing with rubber toys. Patient 11 reported symptoms from rubber balloons only after the diagnosis of latex allergy was made, but not at presentation.

Two symptom-free children were found to have latex allergy because the cross-reactivity between latex and banana is currently being studied at the Department. The frozen serum of Patient 3 had been stored because of specific IgE to banana and was later tested for specific IgE to latex. He did not have a history of latex-associated symptoms. However, previously he had used rubber dummies. Patient 10 was tested for latex allergy, because of a positive SPT for banana. However, his eczema was associated with continuous use of rubber dummies and suggested latex allergy. Four of the children had had 1–2 minor operations (adenotomy, tympanostomy, tonsillectomy).

Assay procedures

A skin prick-test was made with latex antigen prepared from surgical gloves (Exona®, Semperit, Austria) as described by Turjanmaa (4). A banana SPT was performed by pricking first a freshly peeled banana and then the patient's skin. Histamine dihydrochloride, 10 mg/ml, was used as a positive and 50% glycerol solution as a negative reference (Solu-prick[®], ALK, Copenhagen, Denmark). A wheal ≥ 3

Table 1. History of latex-associated symptoms, results of skin prick-test (SPT), specific IgE for latex (CAP) and total IgE measurements, and glove challenge tests in 11 children with clinically important latex allergy

Case no.	Age yrs	Sex	History Initially/ later	SPT	CAP kU/l	Total IgE kU/l	Glove challenge
1.	0.7	M	-/+	4/3	1.5	380	+
2.	1.0	M	-/+	0/5	1.2	11000	-
3.	1.5	M	-/-	0/4	0.8	1200	+
4.	2.7	M	-/+	0/6	3.5	3500	+
5.	5.6	M	-/+	4/4	0.5	820	+
6.	5.8	M	+/+	9/5	7.2	330	nm
7.	6.2	F	+/+	5/4	2.8	280	+
8.	7.2	M	+/+	6/5	5.1	190	nm
9.	9.2	M	-/+	6/3	1.8	1800	+
10.	10.3	M	-/-	4/4	11.0	2500	-
11.	11.1	M	-/+	9/7	3.1	250	+

History: +/- symptoms associated with latex products by the patients themselves initially, /+ = symptoms associated later with latex products by detailed history, - = no apparent symptoms from latex products. SPT is expressed as wheal diameter (mm) caused by latex/histamine, nm = not made, M = male, F = female.

mm in diameter was regarded as a positive reaction. Serum levels of specific IgE antibodies to latex and banana, and total serum IgE were measured using the CAP system (Pharmacia, Uppsala, Sweden). Specific IgE values >0.35 kU/l were considered positive. Latex challenge was performed by first keeping one finger of a latex glove (Triflex^R, Travonol Laboratories, Lessines, Belgium) on a moistened finger for 15 min, and at the same time one finger of a vinyl glove on a moistened finger of the other hand as a control. If no reaction occurred, the latex glove was kept on a moistened hand for 30 min, and a vinyl glove on the other hand. Urticaria on the finger/hand exposed to latex was regarded as a positive reaction.

Results

The results of the SPT, serum total and specific IgE levels and the glove challenge are given in Table 1. SPT for latex was positive in eight (73%), and specific IgE for latex was found in all. Glove challenge was positive in 7/9 (78%) of the children tested. It was made twice in Patients 3 and 10, because they had no history of latex-associated symptoms. The challenge was twice positive in Patient 3 with a negative SPT, but a positive latex CAP test, whereas it was repeatedly negative (30 min and 2 h) in Patient 10, in whom both SPT and latex CAP test were positive.

Discussion

Several peptide antigens are present in both natural rubber latex and processed latex. Generally, serum IgE specific for latex is observed less frequently

than positive reactions in SPTs (4). In contrast, all our 11 patients had a positive latex CAP test but only 8 had a positive SPT. One of the patients had a very high total IgE value, which may have contributed to the positive CAP. It is probable that the latex CAP test (made with ammoniated latex) and the latex SPT (prepared from surgical gloves (Exona[®])), measure partly different latex antigens. The sensitivity of latex IgE test has been reported as 69% (5). Both tests should be used in assessing latex allergy, but their clinical relevance is not yet clear in children.

We did not make a challenge test on every child nor do we consider this necessary for diagnosis of latex allergy. In one of our patients the latex challenge for 2 h was negative despite a positive SPT and CAP test. He may, however, have clinically significant latex allergy for, in adults, prolonged use tests with latex gloves (up to 4 days) have sometimes given positive results. A positive latex challenge may be useful in doubtful cases but its sensitivity in the diagnosis of latex allergy in children remains to be studied.

Partial cross-reactivity has been observed between latex and banana (6). All these 11 children had food allergy, 8 to cow's milk and cereals. A SPT with banana was positive in 4/8 tested and banana-specific IgE increased in 8/11. Five of the 11 children had symptoms on eating bananas. None of the present children had spina bifida or other deformities or major operations, which have been suggested to be risk factors for latex allergy (1).

We conclude that latex allergy may be clinically important in children and even in infants without any previously documented risk factors. It may be more common in atopic children with food allergy. Use of natural rubber dummies and banana allergy may be predisposing factors. Latex allergy carries a risk of anaphylaxis, especially intraoperatively, and should, therefore, be diagnosed promptly. Our patients demonstrate that latex allergy should be looked for not only in children who have undergone multiple operations or in those children reporting symptoms from rubber, but also in children with severe atopic eczema, banana allergy, or urticaria or anaphylaxis of unknown cause.

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