

Latex Sensitivity in Hematologic and Oncologic Non-Atopic Pediatric Patients

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ABSTRACT

Allergic reactions to latex ranging from contact urticaria to severe anaphylaxis have been reported at increased frequency. These forms of hypersensitivity have affected a large group, including health care workers, workers in the latex industry, and children with spina bifida. This present study has been designed to assess the prevalence of allergic reactions to latex products in a group of pediatric patients with hematologic and oncologic disease. The prevalence of latex sensitization was found to be 20% ($n = 6$). Latex sensitization was related to the duration of disease ($p = 0.05$). Our data provide evidence that latex hypersensitivity can be detected in distinct clinical manifestations of those diseases in children. This is the first study that shows pediatric hematologic and oncologic patients have increased risk to latex sensitivity. (Pediatr Asthma Allergy Immunol 2003;16[3]:117-120.)

INTRODUCTION

DUE TO WIDESPREAD USE OF LATEX PRODUCTS, allergic reactions to natural rubber latex have been recognized as a global medical problem. Natural rubber latex is obtained from the *Hevea brasiliensis* tree. These products can cause two types of allergic reactions. IgE-mediated or type I anaphylactic reactions are caused by sensitivity to natural latex sap proteins remaining in latex products. Type IV contact reactions are caused by chemical additives used to manufacture rubber products. Recently, cross-reactive allergic proteins have also been identified in banana, avocado, chestnut, kiwi, grass, and weed pollens.¹

Risk groups are children with spina bifida, health care workers, and workers in the latex industry.² The prevalence and clinical relevance of latex sensitization and allergy in pediatric patients with hematologic disease are not known. These patients, undergoing long-term chemotherapy, radiotherapy, and surgery, may be an important risk group because of various forms of exposure to latex gloves, catheters, adhesives, tourniquets, drains, and anesthetic equipment. The present study reports hypersensitivity to latex in pediatric hematologic and oncologic patients.

MATERIALS AND METHODS

Our study is a cross-sectional study. This study was designed prospectively in a randomized manner. Patients who had been followed at Ankara Training and Research Hospital in the Pediatric Hematology Department were included. All subjects completed a questionnaire on clinical history suggestive of latex al-

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lergy, such as rhinitis, bronchospasm, urticaria, anaphylaxis, and contact dermatitis. The types and number of surgical procedures, catheterizations, and manipulations with latex-containing devices were obtained from medical charts. Inquiries related to a personal history of atopy—such as asthma, allergic rhinitis, atopic dermatitis, and food allergy—were also noted. All interviews and physical examinations were done by the same physician. The study protocol was approved by the Ethics Committee of Ankara Hospital. Written informed consent was obtained from all study participants and parents.

Skin prick tests

Skin prick tests (SPTs) were performed on eight common aeroallergens (Stallergens S.A.-Pasteur, France; *Dermatophagoides pteronyssinus*, *Dermatophagoides farinea*, cat dander, mold mix, grass mix, weed mix, birch, and latex) and four exotic foods (avocado, banana, kiwi, melon). Before SPT was done, patients were asked not to take antihistamines for at least 8 days (30 days in the case of astemizole). SPT was performed on the volar surface of forearm; a drip of glycerinated water-soluble extract solution was pricked with a 1-mm tip of a standard lancet. Both negative (saline) and positive (histamine) controls were used. SPT responses were read at 15 min. A wheal equal to or greater than 3 mm was considered positive. Atopy was defined as presence of at least one positive value of the aeroallergens in the (≥ 3 mm) SPT.

Statistics

Data analysis was performed using SPSS for Windows 10.0. The Wilcoxon Rank-Sum test was used for continuous and ordered data, and the chi-squared test was used for categorical data. Fisher's two-tailed exact test was used if the size of the table cell was less than 5. A p value of <0.05 was regarded as significant. In a multivariate logistic regression, a positive test result demonstrated significance.

RESULTS

SPTs to latex and aeroallergens tests were performed in 30 patients. Their diseases distribution was as follows: 12 patients had thalassemia major, four patients had immune thrombocytopenic purpura, nine patients had acute lymphoblastic leukemia, two patients had intracranial cancer, two patients had Hodgkin lymphoma, and one patient had Wilms tumor. The mean age of the patients was 12.7 ± 4.4 years; 14 patients (46.6%) were male. The age of patients ranged between 3 and 18 years. The family history for atopia was positive in 30% of the cases. In nine patients, the aeroallergen skin prick tests were positive. The prevalence of latex sensitization was found to be 20% (six out of 30 patients), while none of the patients had any dermatitis. None of the patients had any reactions to latex products. No histories of any adverse reactions to four exotic foods (avocado, banana, kiwi, melon) thought to cross-react with latex were given. The clinical data are expressed in Table 1.

TABLE 1. DEMOGRAPHIC DATA OF PATIENTS WITH LATEX POSITIVITY

<i>Etiology of disease</i>	<i>Sex</i>	<i>Age (years)</i>	<i>Number of operations or invasive procedures</i>	<i>Duration of disease (years)</i>	<i>Latex SPT</i>	<i>Other allergens' SPT</i>	<i>Atopy history</i>
Acute lymphoblastic leukemia	Girl	16	5	13	3 mm	Negative	—
Wilms	Boy	17	3	10	3 mm	Negative	—
Thalassemi major	Girl	4	6	4	5 × 4 mm	Grass mix 3 mm	—
Immune trombocytopenic purpura	Girl	5	2	4	5 × 6 mm	Grass mix 5 × 5 mm	—
Immune thrombocytopenic purpura	Boy	15	2	12	3 mm	Negative	—
Rhabdomyosarcoma	Girl	15	3	6	6 × 6 mm	Mite 3 mm	—

Latex sensitization was related to the duration of disease ($p = 0.05$) and the number of operations ($p = 0.05$).

DISCUSSION

Natural rubber latex allergy is a “new” illness whose prevalence reached epidemic proportions in highly exposed populations during the last decade. Latex allergy is an IgE-dependent immediate hypersensitivity reaction to latex proteins. In children with spina bifida and in patients exposed to latex during radiologic procedures, institution of prophylactic safety measures has had demonstrable effects in preventing allergic reactions.¹⁻³ Risk groups are children with spina bifida, health care workers, and workers in the latex industry.^{2,7} Our results showed that children with hematologic and oncologic disease have SPT responses to latex because these patients are frequently exposed. In this study, the prevalence of latex-positive SPT in children with hematologic and oncologic disease is high similar to other reported risk group.⁴⁻⁶ In our previous study in adult patients with malignancy, latex sensitivity increased, particularly when duration of disease and number of invasive procedures were increased. In this study, as in our previous study, in pediatric hematologic and oncologic patients, duration of disease increases latex sensitivity in both atopic and non-atopic patients.⁸

In three patients (three out of six), the aeroallergen SPTs were found to be positive (two were grass, one was mite), while none of the patients had a history for atopia. This may be cross-reactivity with latex. We found that, in pediatric hematologic and oncologic patients, latex sensitivity is high. But there is no study that shows latex sensitivity in the healthy pediatric population in our country. Therefore, we cannot compare the results in a healthy pediatric population.

In this study, we did not find statistically significant sex-linked predominance. This may be due to the fact that using latex gloves is not common among this age.

The prevalence of latex allergy in the general population may be as low as 0.1%, whereas the frequency of latex sensitization is reported to be 7%; this may be due to cross-reacting antipollen IgE.⁹ On the contrary, this study showed that pediatric patients with hematologic and oncologic disease was a high-risk group with respect to latex sensitization (20%). This may be due to the increased number of operation or invasive procedures.

This is the first study that shows pediatric hematologic and oncologic patients have an increased risk to latex sensitivity. We recommend that all high-risk individuals be identified. In addition, careful screening for a clinical history of latex sensitivity should be performed on all patients with hematological disease regardless of their risk group. It may be the best recommendation that latex-allergic individuals be provided with Medic Alert bracelets and self-injectable epinephrine. All medical records should indicate latex allergy. Finally, patients should be educated about the nature of latex allergy and its emergency treatment.⁷

In conclusion, hematologic and oncologic disease in childhood have increased risk to latex sensitivity. However, the study was not designed as a long-term case follow-up trial. Latex sensitivity, in pediatric hematologic and oncologic patients, is an important medical problem. These data should be investigated in larger patient groups in long-term follow-up trials.

ACKNOWLEDGMENT

We thank Prof. Dr. Gül Kiroğlu for kind help in statistical analysis.

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1. I. Bostancý, Y. Dallar, R. Ünsal Sac, E. Karakoc, B. Doganay. 2008. Latex allergy risk assessment in children and adolescents with type I diabetes mellitus. *Pediatric Allergy and Immunology* **18**:8, 687-691. [[CrossRef](#)]