

## Latex anaphylaxis and occupational contact dermatitis developed in the same individual: A case report

**\*Corresponding Author: Maurício Domingues Ferreira**

Professor of Allergy and Immunopathology, Faculty of Medical Sciences IPEMED, São Paulo, Brazil.

Email: madofe@uol.com.br

### Keywords

Latex anaphylaxis; Latex contact dermatitis; Latex Allerg; Occupational Allergy.

### Introduction

According to the Gell-Coombs classification, latex causes two types of allergic reaction: IgE-mediated allergic reaction Type I hypersensitivity, and T lymphocyte-mediated or Type IV hypersensitivity. IgE-mediated latex reaction causes mastocytic and basophilic degranulation and contact urticaria, asthma and anaphylaxis. Latex reaction mediated by T lymphocytes triggers contact dermatitis. The puncture test and radioallergosorbent (RAST) test are essential to a laboratory diagnosis of IgE-mediated latex hypersensitivity, while the T lymphocyte-mediated reaction is diagnosed using the patch test. These tests are not interchangeable, the patch test cannot assess IgE-mediated latex anaphylaxis and the puncture and RAST tests cannot assess T cell-mediated contact dermatitis.

### Case Report

A 43-year-old male, who had worked 16 years at a waste tire recycling plant for asphalt production, began presenting desquamation and itching in his palms and fingers (extensor side) in January of 2016. The problem persisted and intense papular eruptions developed. During periods off work, the condition would regress. In October of 2016, the patient began to present urticaria, skin rash, twitching, dyspnea and wheezing. These symptoms were sporadic at first, gradually increasing until they were a daily occurrence. The condition always began in the morning, after a few hours at work and improved at night at home; when he was off work, he showed no symptoms. Ten days before a definitive diagnosis, the patient started presenting daily crises that appeared immediately upon entering the work environment, characterized by intense dyspnea, wheezing, skin rash and a large facial edema. He was hospitalized for a few days and when he returned to work, the same condition was triggered immediately. He was hospitalized for two days, and upon returning to the work, he again presented wheezing, dyspnea and facial edema. Once hospitalized again, a presumptive diagnosis of latex anaphylaxis was made. While off work, he presented two other episodes of dyspnea, wheezing, palpebral and lip edema and skin rash, when he put on a rubber sandal and on

a different occasion when he was in shorts and sat on a rubber-lined car seat.

The patient presented the following laboratory results: total IgE above 5000; a moderate reaction for the RAST test for latex, 1.71 (0.7-3.5); a very strong reaction for the RAST test for household dust, 53.6 (class V) (50-100); a moderate reaction for the RAST test for epithelia, 12.5 (3.51-17.5); a strong, positive skin prick test for latex (IPISAC laboratory) (6x5mm papule) in relation to histamine (4x3mm papule; positive control); and a positive patch test, showing a moderate reaction with erythema and papule for para-phenylenediamine at 48 h and 96 h readings.

## Discussion

The patient worked for 16 years under daily exposure to rubber. A year before seeking medical assistance, he developed eczema on his hands, suggestive of latex contact dermatitis. His patch test was positive for para-phenylenediamine, one of the substances present in the rubber manufacturing process and one of the main substance involved in latex contact dermatitis. Para-phenylenediamine derivatives are used as antiozonants in the production of rubber products [1]. While off work, the patient presented improvement and the lesions disappeared. These characteristics, together with recrudescence of the lesions while off work and positivity in the contact test for para-phenylenediamine, suggested an occupational latex contact dermatitis. Two months before hospitalization, symptoms of urticaria, skin rash, dyspnea and wheezing were progressively observed, fulfilling the criteria of anaphylaxis [2], involving the respiratory and cutaneous systems and triggered by latex exposure. Skin prick and RAST tests were performed and both were positive for an allergic reaction characteristic of Gell-Coombs Type I hypersensitivity to latex. A diagnosis of latex anaphylaxis is based on medical history, the criteria for anaphylaxis and laboratory data. A significant causal nexus has been observed between clinical manifestations and exposure to latex. The serological tests, RAST, Elisa and Immunocap, and the prick test are assays that characterize a specific IgE hypersensitivity to latex. Approximately 250 latex polypeptides have been identified, and around 60 of them have shown allergenic activity, i.e., binding to IgE. Officially, only 15 allergens have been identified as the main causes of reactions in humans (H. brasiliensis, Hev b 1 through Hev b 15). The current thinking is the Hevb2 and Hevb4 allergens play an important role in IgE-dependent allergy to latex in workers exposed to the same [3]. Once the patient left the latex-rich work environment, he no longer presented anaphylactic crises, aside from two episodes triggered by simple skin contact with latex. These episodes indicate a high degree of sensitivity to latex, where simple contact could be fatal to the patient. One important fact is that latex contact dermatitis, which the patient presents, is unrelated to latex anaphylaxis. They are distinct diseases with different mechanisms, such that latex contact dermatitis is mediated by T cells and monocytes, while anaphylaxis is IgE-mediated. Latex contact dermatitis is not hypersensitivity to a specific latex protein, rather to substances that are used in the manufacturing process. The main reactive substances are amine derivatives of the thiuram, carbamate, Mercaptobenzothiazole, mercapto compounds, and thiourea groups [4,5,6]. The fact that the patient evolved with latex contact dermatitis does not imply a greater likelihood of developing latex anaphylaxis, and the inverse is also true. This is a rare case where the patient presented two different and concurrent types of allergic reaction to latex. In either situation, the treatment is the same; the patient can have no further contact with latex.

## Conclusion

Latex anaphylaxis and latex contact dermatitis have different pathophysiological mechanisms and allergens, but they can rarely occur in the same individual as occupational pathologies.

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**Authors Information:** Maurício Domingues Ferreira<sup>1,2\*</sup>

<sup>1</sup>Professor of Allergy and Immunopathology, Faculty of Medical Sciences IPEMED, São Paulo, Brazil.

<sup>2</sup>Outpatient Clinic of primary immunodeficiencies of the Department of Dermatology, Hospital of Clinics, Faculty of Medicine, University of São Paulo, ADEE3003, São Paulo, Brazil.

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