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Univ di Roma Due Tor Vergata

CONTACT DERMATITIS
ENVIRONMENTAL AND OCCUPATIONAL DERMATITIS

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Contact Dermatitis
Volume 45 Page 165 - September 2001
doi:10.1034/j.1600-0536.2001.045003165.x
Volume 45 Issue 3



Type I hypersensitivity to latex and fungal α -amylase in a laboratory worker

C. L. Fletcher and I. R. White

Case Report

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A 44-year-old woman with a history of asthma and atopic eczema, particularly troublesome on her hands, was referred for patch testing to investigate a possible sensitivity to rubber products. She had been experiencing itching and erythema over her hands shortly after wearing rubber household gloves and when handling rubber balloons. There were no associated mucosal or systemic symptoms.

She worked as a biology laboratory technician in a school and once a year prepared an aqueous suspension of α -amylase used in some of the class experiments. Contact with this preparation would cause immediate erythema and itching localized to her hands, with no concomitant respiratory or nasal symptoms.

Examination revealed patches of eczema over the dorsal surface of both hands and all fingers.

Type I hypersensitivity to natural rubber latex and α -amylase was suspected and the results of prick testing confirmed this; a prompt wheal with 50-mm pseudopodia was elicited by purified latex protein extract (ALK-ABELLÓ). An aqueous suspension of fungal α -amylase (*Aspergillus* sp., brought in by the patient) caused a 10-mm wheal also accompanied by pseudopodia. The histamine control resulted in a 5-mm wheal, whilst prick testing to bacterial α -amylase (*Bacillus subtilis*) and normal saline gave negative results.

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Authors:

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Key words:

- ☐ α -amylase
☐ latex hypersensitivity
☐ occupational
☐ laboratory workers
☐ enzymes
☐ atopy

☐

Affiliations

Patch testing produced no relevant reactions.

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Discussion

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Amylases are enzymes of bacterial or fungal origin that are capable of breaking down polysaccharides into mono- and disaccharides. They are widely used in the baking industry as 'dough improvers': facilitating the rising of the dough, enhancing taste and extending shelf life. α -amylase randomly splits the starch molecules, forming low molecular weight sugars, whereas β -amylase is only capable of cleaving off the maltose at one end of the starch molecule. Bacterial α -amylase is also used in biological washing powders.

To cite this article
Fletcher, C. L. & White, I. R. (2001)
Type I hypersensitivity to latex and
fungal α -amylase in a laboratory
worker.
Contact Dermatitis **45** (3), 165-165.
doi: 10.1034/
j.1600-0536.2001.045003165.x

Flindt (1), in 1979, was the first to describe IgE-mediated reactions to α -amylase in enzyme-handling factory workers presenting with asthma and rhinitis.

Occupational allergic contact urticaria and protein contact dermatitis have been described in exposed bakers (2, 3). Rhinoconjunctivitis is also a well-recognized sequela. Prick test reactions specific to fungal but not bacterial α -amylases have been reported previously by Kanerva et al. (2) and Flindt (1).

Prick testing is a sensitive, relatively non-invasive, method of investigating possible hypersensitivity to α -amylases, which may be used in conjunction with RASTs or other serological tests, or bronchial provocation testing. Highly-purified amylase should be used for prick testing, as heavy contamination with proteins from culture media has been reported in industrial amylases used in the baking industry (4).

This case is unusual in that hypersensitivity to α -amylase developed from infrequent contact with the enzyme, with symptoms localized entirely to the hands. Respiratory symptoms are a prominent feature in cases of industrial exposure, but were lacking in this case. We presume that sensitization occurred via the hands rather than following inhalation of the allergen. The physical properties of the α -amylase that she handled would support this: a heavy sand-like powder with little propensity for the particles to become airborne.

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