

Latex and amoxicillin-provoked occupational asthma

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Key words: antibiotics; health-care workers; latex; occupational asthma.

• In the last few years, natural rubber latex (NRL) hypersensitivity has been increasingly reported to be caused by rubber gloves, catheters, and other equipment used in anesthesia and surgery. IgE-mediated reactions to latex are type 1 immunologic responses (1) and include contact urticaria, rhinitis, and more severe conditions such as asthma and

anaphylactic reactions.

Nevertheless, the clinical presentation of latex allergy consistently

takes the form of

delayed hypersensitivity (type IV) (2), which is correlated with rubber additives and develops as contact or irritant dermatitis.

A 61-year-old woman, an operating room nurse, with a family history of atopy, who had suffered from atopic dermatitis and rhinitis since early childhood, came under our observation. In 1987, she had developed on both hands, mainly after wearing rubber gloves, severely itchy eczema, especially on the fingers. The patient also had sneezing, cough, itchy throat, dyspnea, and asthma. Such symptoms were strictly correlated with working days, disappearing without treatment after 1 week away from the workplace. Five years before, the patient had had an anaphylactic reaction after contact

with latex gloves during a gynecologic examination. Since she had to undergo surgery, she needed a preoperative management protocol.

Patch tests of the GIRDCA (Gruppo Italiano di Ricerca per le Dermatiti da Contatto ed Ambientali) were applied and gave positive results for mercaptobenzothiazole and thiouram. RAST to latex, penicilloyl G, penicilloyl V, ampicillin, amoxicillin, and cefaclor was performed according to the conventional technique as well as the CAP System (Pharmacia, Uppsala, Sweden) and revealed sensitization to latex (27.34 kU/l) and amoxicillin (10.32 kU/l). Skin prick test (SPT) with common commercial inhalant allergens were negative; SPT with a commercial extract of NRL and the inhalation challenge test with NRL gloves were not performed due both to the high IgE level to latex and to the severe anaphylactic reaction reported by the patient. SPT with the different penicillin determinants PPL and MDM (Allergopen, Bracco, Milan, Italy) gave negative results. On the other hand, it is conceivable that the antigenic determinant responsible for sensitization was probably the aminohydroxyphenyl side-chain of amoxicillin. In addition, it has been previously reported that patients with amoxicillin sensitivity have good tolerance of either oral or inhaled penicillin (3). The baseline lung function test resulted in a FEV₁ of 2600 ml, 84% predicted value, FEV₁/FVC ratio of 63%.

To evaluate the role of the antibiotics responsible for occupational asthma in such a subject, a challenge test with amoxicillin was performed according to Pepys et al. (4). The administration of 0.24 mg of isoprenaline sulfate blocked the late asthmatic reaction. "Analar" lactose was

used both as control and as the vehicle for the test material (1 g of commercial amoxicillin in 250 g of antibiotic powder with the provocation challenge continuing for 30 min). The results are expressed as maximum percent fall from the FEV₁ before exposure to the antibiotic powder, and occur in a 36% fall in comparison to prechallenge values, thus confirming a strict correlation between developing asthma and amoxicillin sensitization.

Our results suggest the following interesting considerations:

- 1) In our patient, RAST determination revealed a dual sensitization to both latex and amoxicillin, suggesting an occupationally related disease occurring in a hospital employee. A recent report (5) described a 24-year-old, female pharmaceutical worker who developed asthma at work. SPT with a commercial extract of NRL (Stallergènes SA, Brussels, Belgium) gave positive results. Exposure to amoxicillin powder elicited significant changes in FEV₁. The authors (5) suggest that further epidemiologic investigation is needed to clarify the prevalence of occupational asthma in hospital departments.
- 2) Is there a relationship between latex allergy and sensitization to mercaptobenzothiazole? In fact, it is known that processing of concentrated NRL includes the addition of a variety of chemicals such as antioxidant accelerators (e.g., thiuram, mercaptobenzothiazole), emulsifiers, and others (6). In addition, it has been stated in the dermatologic literature that "sensitivity to rubber itself probably does not exist" (7). Therefore, it has been suggested that contact dermatitis due to rubber hypersensitivity might be

Seizures were induced by indomethacin and ASA in a patient without neurologic medical history.

caused by various agents added to the rubber preparation (8).

In conclusion, our observations suggest that the incidence of occupational asthma in health-care workers might be correlated to indiscriminate use of antibiotics (amoxicillin) and derivatives in hospital departments.

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References

1. Nutter AF. Contact urticaria to rubber. *Br J Dermatol* 1979;101:597-598.
2. Heese A, von Hintzenstern J, Peters KP, Kock HU, Hornstein OP. Allergic and irritant reactions to rubber gloves in medical health services. Spectrum, diagnostic approach and therapy. *J Am Acad Dermatol* 1991;25:831-839.
3. Coutts I, Dally B, Newman-Taylor J, et al. Asthma in workers manufacturing cephalosporins. *BMJ* 1981;283:950.
4. Pepys J, Hutchcroft BJ. Bronchial provocation tests in etiologic diagnosis and analysis of asthma. *Am Rev Respir Dis* 1975;112:829-859.
5. Vandenplas O, Delwiche JP, De Jonghe M. Asthma to latex and amoxicillin. *Allergy* 1997;52:1147-1149.
6. Vandenplas O. Occupational asthma caused by natural rubber latex. *Eur Respir J* 1995;8:1957-1965.
7. Taylor JS. Rubber. In: Fisher AA, editor. *Contact dermatitis*. Philadelphia: Lea & Febiger, 1986:603-643.
8. Spaner D, Dolovich J, Tarlo S, Sussman G, Butto K. Hypersensitivity to natural latex. *J Allergy Clin Immunol* 1989;83:1135-1137.

Open challenge to nuts in children

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Key words: challenge test; food allergy; nuts.

● ALLERGIC reactions to nuts are potentially fatal (1). Consequently, the diagnosis of nut

allergy imposes severe restrictions on patients of strict dietary monitoring, carrying injectable epinephrine at all times, and fear of death. Therefore, suspected nut allergy should be verified to avoid unnecessarily onerous lifestyle restrictions. Allergy tests, either skin prick tests (SPT) or serum specific IgE, are useful in confirming this diagnosis, as the proportion of false-negative test results in IgE-mediated allergy is low (2). If these give negative results, the history needs to be confirmed by a nut challenge, because either the perceived reaction has not been precipitated by nuts or, as has been recently demonstrated, a small number of subjects believed to be nut allergic are on later challenge found to tolerate nuts (3). The double-blind, placebo-controlled challenge is

An open nut challenge procedure is described to confirm or refute nut allergy where suspected, but allergy tests are negative.

regarded as the reference standard for food challenges, but it is a time-consuming and expensive procedure (4).

We report on the results of nut challenges in a group of children perceived to be nut allergic from a clear history of symptoms following nut exposure but who had negative allergy test results. Our findings confirm the value for food challenges where indicated (4), and we propose a simple open nut challenge procedure carried out on a day ward.

- Seventeen children aged 1-10 years were identified in our clinic between March 1997 and May 1998. All had a history of nut allergy; symptoms experienced and responsible nuts are shown in Table 1. These patients underwent nut challenges, as they all had a negative SPT (Alk) and/or negative serum specific nut IgE (Alastat, Diagnostic Products Corporation) results.
- Open nut challenges were carried out on the paediatric day ward. Written guidelines detailing the symptoms of and rescue treatment for anaphylaxis in children,

Table 1. Nut challenge in 17 patients: clinical characteristics and test and challenge results

Age (years) at symptoms	Challenge	Presenting symptoms	Suspected nut	Results of		
				SPT	Serum	Challenge
4	9	Facial urticaria	Peanut	NEG	NEG	NEG
1.5	2	Facial urticaria	Peanut	ND	NEG	NEG
1	5	Facial urticaria	Peanut	NEG	NEG	NEG
7	9	Urticaria, lip angioedema, wheeze	Peanut	ND	NEG	NEG
2.5	3	Urticaria, angioedema	Peanut	NEG	NEG	NEG
4.5	5	Facial urticaria	Almond	NEG	NEG	NEG
2.5	4	Urticaria	Peanut	NEG	NEG	NEG
1	1.25	Urticaria, angioedema	Peanut	NEG	NEG	POS
0.9	1.5	Urticaria, angioedema	Peanut	ND	NEG	NEG
7	7.5	Urticaria, vomiting	Coconut	NA	NEG	NEG
4.5	5.25	Nausea, dyspnoea	Coconut	NA	NEG	NEG
6	7.5	Urticaria	Brazil nut	NEG	ND	NEG
2	2.3	Urticaria	Peanut	ND	NEG	POS
1.5	4	Urticaria, lip angioedema	Hazelnut	ND	NEG	NEG
0.7	8	Urticaria, angioedema, conjunctivitis	Peanut	ND	NEG	NEG
0.5	2.5	Urticaria, facial angioedema	Peanut	ND	NEG	NEG
9.5	10	Urticaria, abdominal pain	Almond	NEG	NEG	NEG

NEG: negative; POS: positive; ND: test not done; NA: test not available.