Asthma and contact urticaria from latex gloves in a hospital nurse

Renata De Zotti, Francesca Larese, Antonio Fiorito

Hypersensitivity to rubber is usually reported as contact dermatitis due to substances used in its processing; however, recent reports in patients attribute IgE mediated reactions specifically to latex and not to chemical additives. These patients were first seen with contact urticaria, but tissue contact with both medical and non-medical latex rubber may also precipitate anaphylactic reactions mediated by IgE.1-3

We describe a case of immediate hypersensitivity to natural latex in a nurse working in a dialysis unit.

Case report
A 37 year old woman had been working since 1975 as a nurse in a hospital, spending most of her time in a dialysis unit. She had no history of nasal polyps or sinusitis. She had a long history of urticaria resulting from food and drugs (acetylsalicylic acid and non-steroidal anti-inflammatory agents), a seasonal rhinitis, and a long standing dermatitis through hand contact, which required periodic treatments with topical steroids. She also had positive patch tests to many haptens (nickel sulphate 2.5% pet, paraben mix 12% pet, 4,4’-diaminodiphenilmethane 0.5% pet, benzocaine 5% pet, balsam of Peru 25% petroleum jelly pet), fragrance mix 16% pet, p-phenylenediamine 1% pet, PPD mix 0.6% pet, p-aminophenol 1% pet, benzylkonium chloride, 0.01% aq, disperse yellow 3, 1% pet, disperse red 1, 1% pet). At the age of 30 she started to note urticaria and rhinorrhea when wearing latex gloves and for this reason she preferred to use vinyl or cotton gloves in direct contact with her skin.

Four years ago, after a routine examination by a gynaecologist wearing latex gloves, she developed an immediate local pruritis and a generalised urticaria. Since then, although she completely avoided the personal use of latex gloves, she often perceived a mild rhinorrhea and skin itching, and also in the last year a shortness of breath when working in dialysis. This was mainly when in contact with other nurses who wore latex gloves. Symptoms disappeared completely while she was away for some months during pregnancy and when she worked in a medical ward. During the months before evaluation she noted a worsening of the symptoms when working in dialysis, with frequent dry cough, shortness of breath, and wheezing and she started to use β2 agonists. The record of her peak flow rate, taken four times daily for eight weeks showed average values of about 540 l/min during days at work, with repeated falls to 340–380 l/min when working in dialysis. During 10 days of holiday the values were 560–570 l/min.

At first evaluation in hospital the physical examination was normal. Skin tests by the prick method were positive to many common inhalant allergens (dermathophagoides pteronyssinus and farinae, pollens, animal danders) but we found a RAST II class only for compositae (Pharmacia Diagnostics AB, Uppsala, Sweden); IgE concentration was 27.8 U/ml. To test latex by skinprick we incubated pieces of gloves (1 mg/1 ml) in sterile physiological saline at room temperature for one hour; the solution from this incubation was used to test the patient and other atopic cases (five) and non-atopic (five) controls. This solution elicited a local reaction with a 10 mm diameter weal and 30 mm flare in the patient but no reactions in the controls.

A RAST done with natural latex as the antigen was in class II. The patient underwent a challenge test after 10 days of absence from work, and she was free from any respiratory or cutaneous symptom. She wore one latex glove on her right hand while her respiratory function was monitored (figs 1 and 2). After 10 minutes she started to feel an itching throat and nose and a tickling on the hand and she removed the glove. The peak flow and records of forced expiratory volume in one second (FEV1) documented, after many normal days, an immediate bronchospasm that lasted about two hours; at the same time weals and flares appeared on her head and neck. These disappeared eight to nine hours later.

Discussion
Urticaria as an immediate hypersensitive reaction to latex was first recorded 10 years ago and since then many cases have been described, mainly in hospital
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Figure 1  Forced expiratory volume in one second (FEV₁) after challenge test with a latex glove.

Figure 2  Peak flow (PEF) readings before and after challenge test.

work where various types of rubber gloves are used for surgical operations and examinations, personal protection, and cleaning. More recently asthma and even severe anaphylaxis caused by the use of natural latex products have been reported in patients during medical examination or surgery and also in the workplace and during normal activities. The allergen of latex has not been determined: it may be an isoprene-derived contaminant, or it may be some proteins contained in natural latex, but not in natural or synthetic rubber. The diagnosis of latex hypersensitivity is based upon a history of anaphylactic symptoms after exposure to latex and laboratory studies including radioallergosorbent tests or skin testing with latex solution. In our case all of these diagnostic criteria were fulfilled and furthermore the challenge test using materials from latex gloves ratified the relation between exposure to latex gloves and symptoms. We cannot exclude the presence of minor additives in the liquid latex and finished rubber product (mercaptobenzothiazole, thiuram, and carbamate mix), but these have not been reported to cause an immediate hypersensitivity response or asthma and, in any case, our patient did not show delayed hypersensitivity to common rubber additives. Atopy, hand eczema, and surgical work were recognised as predisposing factors for immediate latex allergy and in effect our patient suffered from common urticaria, seasonal rhinitis, and contact dermatitis; furthermore she was a nurse in dialysis, where gloves are a necessary means of personal protection and where, probably, she also came into contact with other latex products. When we examined her she was free from cutaneous disease, but the previous impairment of her skin barrier due to eczema could have favoured the sensitisation and the contact of latex with the vaginal mucosa during the gynaecological examination may have enhanced the sensitisation process. The repeated asthmatic attacks when the patient worked in dialysis, where latex products were present although not directly handled by the nurse, suggest that besides unintentional contacts with latex an inhalation of the latex antigen could take place.

As life threatening anaphylactic reactions occur during surgical procedures and in people with skin diseases we think that in our patient the clinical manifestations after the short challenge test could have been more severe if the skin of the contact area were injured. This stresses the role of skin disruption in the absorption of latex antigen and also the need for caution in repeating the exposure to latex in highly sensitive patients.

Despite the widespread use of latex, occupational anaphylactic type reactions have only been reported in a few cases probably because episodes go unrecognized.

Immediate allergy to latex gloves can be considered as an occupational disease among hospital personnel and recent and more frequent use of such gloves for personal protection will probably increase the numbers showing clinical sensitivity; for this reason it is necessary to focus on the identification of predisposed people and on the opportunity of finding acceptable substitutes for latex gloves. The aim of the prevention is to allow sensitised people to continue their routine work safely but also to warn them of the risk of repeated non-occupational exposure to latex, including surgical procedures, physical examinations, dental treatments, and the use of other latex products.

5 Turjanmaa K. Incidence of immediate allergy to latex gloves in hospital personnel. Contact Dermatitis 1987;17:270-5.

Accepted 25 November 1991
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R De Zotti, F Larese and A Fiorito

doi: 10.1136/oem.49.8.596

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