

Allergic contact urticaria from natural rubber latex in healthcare and non-healthcare workers

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To compare the prevalence of natural rubber latex (NRL) sensitization and allergic contact urticaria from NRL in healthcare and non-healthcare workers, we studied all 1171 patients who attended our clinic during 2001 and 2002. Prick testing for NRL and patch testing with European standard series were performed in all patients and an additional rubber series in those who had contact with rubber. Specific immunoglobulin E (IgE) levels against NRL and tropical fruits were measured when prick testing was positive. Sensitization to NRL (positive prick test and specific IgE levels) was much more common in healthcare workers than that in non-healthcare workers, 16.7 versus 2.3%. Among the non-healthcare workers, sensitization to NRL was more common in food handlers (17.1%), construction workers (6.6%), painters (6.2%), hairdressers (5.1%) and cleaners (3.8%). The difference in the prevalence of specific IgE to tropical fruits was not significant. Allergic contact urticaria from NRL was also much more frequent in healthcare workers, 71.4 versus 28.6%. In conclusion, sensitization to NRL and allergic contact urticaria from NRL are more common in healthcare workers, but this is a growing problem in non-healthcare workers and should be investigated in all workers with a history of NRL intolerance or who have contact with NRL.

Key words: allergic contact urticaria; healthcare workers; non-healthcare workers; occupational; prick test; sensitization to NRL. © Blackwell Munksgaard, 2004.

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Sensitization and allergy to natural rubber latex (NRL) is a growing problem in the workplace and in private life with potentially severe complications. Initial reports of allergy to NRL reflected only contact urticaria, but anaphylactic reactions, many of them with fatal outcome, have been described with increasing frequency thereafter (1–6). Most studies and reports on latex allergy have focused on healthcare workers, who have traditionally been considered to be the occupational group most commonly affected, with an estimated prevalence between 2.9 and 12% (7–14). However, a few reports have reflected the existence of sensitization and allergy to NRL in non-healthcare workers (15–20). Although it is appreciated that regular glove wearers among non-healthcare workers are at risk of NRL allergy, their prevalence has not been fully assessed. In the present study, we compare the frequency of NRL sensitization and allergic contact urticaria from NRL in healthcare and non-healthcare workers.

Materials and Methods

To compare the frequency of NRL sensitization and allergic contact urticaria from NRL in healthcare and non-healthcare workers, we studied retrospectively all patients who attended our department for the assessment of occupational skin diseases during 2001 and 2002. Clinical history, physical examination, prick testing for NRL and patch testing with the European standard series were performed in all patients. Patch testing with an additional rubber series was performed in those patients who used rubber gloves or boots. NRL-specific immunoglobulin E (IgE) levels were measured when prick testing was positive. Because cross-reactivity has been established between latex and tropical fruits (21), we also measured specific IgE levels against tropical fruits.

Patch testing

All allergens for standard patch testing and the rubber chemicals were supplied by Chemotechnique

Diagnostics (Malmö, Sweden). All tests were applied to the upper back and secured with self-adhesive Fixomull™ (Beiersdorf, Hamburg, Germany). The strips were removed after 2 days, and readings were taken at day (D) 2 and D4.

Prick testing

Prick testing was performed with NRL in aqueous dilution (0.5 mg/ml) provided by ALK Abello (Barcelona, Spain) using lancets supplied by Romed-Holland (made in EEC, J. N. Eberle, Germany). Controls were made with 0.9% NaCl in water and aqueous dilution of histamine (10 mg/ml). Tests were read after 15 min. An erythematous papule of at least 3 mm in diameter was required for a positive test.

Specific IgE test

Blood samples were taken for the determination of IgE against NRL and tropical fruits (banana, kiwi, avocado and chestnut) with Pharmacia CAP® system fluorescence immunoabsorbent assay (CAP-FEIA) for commercially available allergens, according to the manufacturer's instructions (Pharmacia Diagnostics AB, Uppsala, Sweden). A positive CAP was defined as >0.35 kU/l.

Results

Of the total of 1171 patients studied, 38 (3.3%) had a positive prick test for latex. In all these 38 patients, the specific IgE level against latex was greater than 0.35 KU/l, being higher in healthcare workers (mean 24.2) than that in non-healthcare workers (mean 11.38) ($P < 0.05$). 23 of these patients (60.5%) had a concurrent specific IgE to 1 or more tropical fruits tested. The incidence of specific IgE to tropical fruits between healthcare workers (7/13, 53.8%) and non-healthcare workers (16/25, 64.0%) was not significant ($P > 0.05$).

A positive prick test for latex was much more frequently seen in healthcare workers (13/78, 16.7%) than that in non-healthcare workers (25/1093, 2.3%). The occupations with the highest incidence of positive prick tests for latex were food handlers (7/41, 17.1%), construction workers (5/76, 6.6%), painters (2/32, 6.2%), hairdressers (3/59, 5.1%) and cleaners (3/78, 3.8%).

14 patients with positive prick tests presented with allergic contact urticaria from NRL, this being more frequent in healthcare workers (10/14, 71.4%) than that in other occupations (4/14, 28.6%) ($P < 0.05$). In total, 10 of the 78 healthcare workers (12.8%) and 4 of the 1093 non-healthcare workers (0.3%) had allergic contact urticaria from

NRL, being found in 2 of the 41 food handlers (4.87%) and in 1 of the 78 cleaners (1.28%).

28 of the 38 patients (73.7%) with sensitization to NRL had associated eczema of the hands, and 31 patients (81.6%) had 1 or more positive reactions on patch testing. A positive prick test for latex was more common in women (24/38, 63.2%) than that in men (14/38, 36.8%) ($P < 0.05$). Allergic contact urticaria from NRL was also more common in women (12/14, 85.7%) than that in men (2/14, 14.3%) ($P < 0.05$). A history of atopic dermatitis was not significant in patients with a positive prick test for NRL ($P > 0.05$), but allergic contact urticaria from NRL was seen more commonly in atopic patients ($P < 0.05$).

Discussion

Sensitization to NRL was much more common among healthcare workers than that in non-healthcare workers, which is in accordance with previous studies, and is probably because of the more frequent direct and indirect contact with NRL in healthcare work. The frequency of 16.7% in healthcare workers is higher than that found in recent studies and is partly explained by the fact that we are a referral centre for occupational skin diseases and that all healthcare workers who attend our department have some kind of dermatitis (11, 14). This same argument applies to non-healthcare workers among whom we found a prevalence of 2.3%, which is higher than that observed in the general population (12). However, when we studied the non-healthcare occupations separately, we found even higher frequencies, between 3.8 and 17.1%, especially in hairdressers, construction workers, cleaners and food handlers, all of whom increasingly use latex gloves. These high prevalences indicate that sensitization to latex is a growing problem among non-healthcare workers, even when taking into account the possible bias in our patient population.

28 of the 38 patients (73.7%) with sensitization to NRL had associated eczema of the hands, and 31 patients (81.6%) had 1 or more positive reactions on patch testing. This high frequency of allergic contact dermatitis and hand eczema in these patients suggests a role for eczema in the development of sensitization to NRL with subsequent Type I reactions (18). In our study, we did not include patch testing with NRL. Although patch testing with NRL has been suggested in patients with allergy to latex, in a large recent study of 608 patients none showed consistent allergic reactions to NRL patch test, and most of the doubtful reactions resolved within 4 days, suggesting that they were irritant (21).

Only 14 of the 38 patients with a sensitization to NRL showed allergic contact urticaria from NRL, which was also significantly higher in healthcare workers. This might suggest that there are many workers with sensitization to latex without clinical features, in which prevention might avoid unnecessary clinical complications. The use of low-allergen NRL or non-latex gloves seems to be an effective measure in control of NRL allergy in the workplace, both in healthcare workers who have NRL allergy and in non-healthcare workers, if they are not working directly with NRL-containing materials in production (13).

We found no significant difference in the prevalence of specific IgE to tropical fruits between healthcare workers (7/13, 53.8%) and non-healthcare workers (16/25, 64.0%) ($P > 0.05$), in those with positive prick tests and elevated specific IgE against NRL, which has never been studied before.

In summary, sensitization to NRL and allergy from NRL is a growing problem with potentially severe complications in both healthcare and non-healthcare workers. Screening for NRL allergy with prick testing is easy, cheap, relatively safe and rapid and might avoid unnecessary NRL exposure and complications. We recommend screening for NRL allergy with prick testing in patients with a history of NRL intolerance, healthcare workers and in all other occupations who have direct or indirect contact with NRL (boots and gloves). Specific IgE levels against latex should be measured when prick testing is positive to determine the potential risk for contact with NRL in the patient's occupational and private life. We suggest substituting latex gloves with low-allergen latex or non-latex gloves whenever possible in both healthcare and non-healthcare workers.

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