

A Case of Contact Urticaria from a Latex Glove Occurred to an Operating Room Nurse

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The prevalence of latex allergies has been on the increase along with the greater use of rubber products in daily life, medical, dental and occupational settings. Allergic reactions to latex can take two clinical forms of either contact dermatitis or immediate hypersensitivity reactions, which are provoked by the natural latex proteins or chemical additives used in the manufacturing process, respectively.

A 25-year-old female, an operating room nurse, complained of recurrent pruritic erythematous wheals on both hands after the wearing of latex rubber gloves. The prick test and the usage test to the latex gloves were positive, and the RAST was class 3. To the best of our knowledge, this is the first case report of contact urticaria from latex rubber gloves in Korean dermatologic literature. (*Ann Dermatol* 11(4) 260~262, 1999).

Key Words : Latex allergy, Type 1 hypersensitivity, Operating room nurse.

Allergy to natural latex affects people routinely exposed to rubber products. As the use of rubber products has increased recently, the incidence of latex allergy has been greatly increased. Hypersensitivity reactions to rubber could result in urticaria, contact dermatitis, rhinitis, conjunctivitis, angioedema, anaphylaxis, and even death. Because of the potential risk of severe problems caused by a latex allergy, dermatologists should be aware of the prevalence, symptoms, diagnosis, and the management of latex allergies.

Herein we report a case of contact urticaria caused by hypersensitivity reaction to latex.

CASE REPORT

A 25-year-old female, an operating room nurse, complained of recurrent pruritic, erythematous wheals on both hands for 3 years, which occurred several minutes after wearing surgical gloves. The

eruption cleared when she was away from work and recurred during her job. She has a past history of hand eczema and atopy and denied any food allergies. Family history was non contributory. There was no abnormality in physical examination. At the time of the first evaluation, there was no skin lesion except some scratch marks on the dorsum of the hands (Fig. 1). She had positive patch tests to cobalt, nickel, fragrance mix, captan in the European standard patch test series, but was negative to rubber series. Scratch patch tests to rubber additives (thiuram mix, mercaptobenzothiazole, and carbamate mix) and latex rubber itself were also negative. A routine prick test was negative. A prick test with a latex solution, prepared by the incubation of twenty pieces of 1cm² sized latex glove in 5ml of normal saline for 24 hours, elicited 4+, which meant a greater reaction than histamine (Fig. 2). A usage test, wearing a rubber glove on a wet hand, showed several localized pruritic wheals with flare on her hands within 20 minutes. The prick test for some foods which might be cross-react with rubber protein, such as banana, wheat grain, spinach, and tomato, were negative (Fig. 2). The latex RAST result was class 3, and the concentration was 4.08.

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rubber (cis 1,4-polyisoprene), 2% resin, 65% water and 1.8% protein¹. During the manufacturing process of glove production, many chemicals including antioxidants, accelerators, stabilizers and vulcanizers are added to improve its properties². Such additives and latex protein (rubber particles, lutoids, Frey Wyssling particles) could be the cause of latex allergies.

Two types of allergic reactions to rubber products are now known: type I (immediate type) and type IV (delayed type hypersensitivity). Type I reaction is provoked by small latex protein through Ig E-mediated mechanism and the diagnosis is usually made by Prick test or RAST. Type IV reaction is caused by manufacturing additives through the cell-mediated mechanism and can be diagnosed by patch testing³.

Anaphylactic reactions have most often been caused by exposure to surgeon's latex gloves, during abdominal or genitourinary surgery or by other sources of mucosal exposure to latex such as barium enema catheter tips or endotracheal ballooning⁴. Latex is known to cause at least 10% of all intraoperative anaphylactic reactions⁵.

Contact dermatitis through delayed hypersensitivity reaction usually develops several hours to days after exposure to latex. The symptoms of contact dermatitis to latex, including itching, redness,

Fig. 1. The prick test showed a positive reaction to the latex solution and a negative reaction to other possible cross-reactants and rubber additives (arrows; wheal, arrow heads; erythema).

DISCUSSION

Natural latex, the milky fluid from *Hevea brasiliensis* tree, contains approximately 33% of

Fig. 2. Usage test; (A) before test, (B) multiple, pruritic, erythematous wheals develop 20 minutes after the application of latex gloves.

and occasional blistering in areas of direct contact, are similar to that of other contact dermatitis which is caused by nickel or poison ivy⁶.

The prevalence of latex sensitivity in the general population was reported as 0.13% to 7.9% according to diverse references^{7,8}. Among the health care workers and operating room nurses, the prevalence rate is known to be 12% and 11%, respectively^{9,10}.

Groups at high risk to latex allergies are those with occupational exposure to latex such as medical personnel and rubber industry workers, patients who have undergone multiple surgical procedures from congenital anomalies, and persons who have had repeated enema or condom users. And the incidence of latex allergy increases in persons with preexisting hand eczema, a personal history of atopy or a fruit allergy and female³.

Several foods share a cross-reactivity with latex, especially avocados, bananas, chestnuts, kiwis, peaches, mangoes¹¹, and some inedible plant proteins such as profilin and ficin also show a cross-reaction with latex^{12,13}.

Physicians, nurses, and dentists are at greater risk of becoming allergic to latex because of many medical instruments made of latex. These medical instruments include surgical and examination gloves, catheters, intubation tubes, anesthesia masks, balloons, tourniquets, and dental dams. According to Jones *et al.*, about 70% of symptomatic medical personnel show latex sensitivity¹⁴.

There are many kinds of tests for the diagnosis of latex allergy, which include the prick test, RAST, the use test, the rub test, the scratch chamber test, the intradermal test, the patch test, and latex specific antibody assays. Among these, the prick test is the most sensitive. Therefore, it is suggested to be the standard method to detect latex allergy³.

The management of latex allergy includes avoidance of direct contact with latex proteins, the use of latex substitutes such as Tactylon, the use of powder-free gloves to reduce aeroallergens, and the relief of symptoms with topical steroids and oral antihistamines.

Nowadays, the greater use of rubber materials in daily products and medical instruments brings with it the higher chance of exposure to latex. Much concentration has been focused on latex allergies because it may lead to unexpected occupa-

tional problems or even death. Dermatologists should be aware of the importance of the latex allergy and try to find the exact antigen of latex allergy, and the methods of prevention, for the effective management of latex allergy.

REFERENCES

1. St Cyr D R. Rubber, natural. In: Kirk-Othmer(ed): Encyclopedia of chemical technology. New York: John Wiley & Sons, 468-491:1982.
2. Conde-Salazar L, del-Rio E, Guimaraens D, Domingo AG: Type IV allergy to rubber additives: a 10-year study of 686 cases. *J Am Acad Dermatol* 29;176-180, 1993.
3. Erin MW: Latex allergy. *J Am Acad Dermatol* 39; 1-24, 1998.
4. Sussman GL, Beezhold DH: Allergy to latex rubber. *Ann Intern Med* 122; 43-46, 1995
5. Pecquet C, Leynadier F, Dry J: Contact urticaria and anaphylaxis to natural latex. *J Am Acad Dermatol* 22; 631-633, 1990.
6. AL. Melton: Managing latex allergy in patients and health care workers. *Cleav Clin J Med* 64; 76-82, 1997.
7. Turjanmaa K: Allergy to natural rubber latex: a growing problem. *Ann Med*. 26;297-300, 1994.
8. Merrett TG, Merrett J, Bhambri S, Kekwick R, Prevalence of latex specific Ig E antibodies in the UK. *J Allergy Clin Immunol* 95;154, 1995.
9. Sussman GL, Liss GM: Latex allergy: epidemiologic study of 1351 hospital workers. *J Allergy Clin Immunol* 99(suppl);S344, 1997.
10. Laugier F, Vervloet D, Lhermet I, *et al.*: Prevalence of latex allergy in operating room nurses. *J Allergy Clin Immunol* 90; 319-322, 1997.
11. Beezhold DH, Sussman GL, Liss GM, Vhang N-S: Latex allergy can induce clinical reactions to specific foods. *Clin Exp Allergy* 26; 416-422, 1996.
12. Vallier P, Balland S, Harf R, *et al.*: Identification of profilin as an Ig E-binding component in latex from *Hevea brasiliensis*: clinical implications. *Clin Exp Allergy* 25; 332-339, 1995.
13. Halsey JF, Williams PB. Antigenic determinants in ficin dominate latex-specific Ig E responses. *J Allergy Clin Immunol* 99(suppl); S342, 1997.
14. Jones RT, Bubak ME, Grosselin VA, Yunginger JW: Relative latex allergen contents of several commercial latex gloves. *J Allergy Clin Immunol* 89; 225, 1992.