
Latex Allergies

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Abstract

With the increase in the demand for latex products, latex allergy has emerged as a challenge for both health-care workers and the general population. It is important to identify the existence of this problem and, where skin changes occur in relation to the use of a latex product, the diagnosis of latex allergy needs to be considered.

Introduction

Several hundred cases of allergic reactions have been reported to the USA Federal Drug Administration (FDA), including 16 deaths in 1989 following radiological examination for gastrointestinal tract disorders. Investigations found that all the patients had received barium enemas and had suffered anaphylactic reactions to latex. The cause was directly related to the latex-cuffed enema tip¹⁻⁴.

In August 1997, the Albury Base Hospital in New South Wales was ordered to pay more than \$100,000 compensation to a nurse who developed a severe allergic reaction to latex while working in the hospital's intensive care unit⁵. According to the compensation solicitor at Whyburn and Associates, the compensation decision was a landmark ruling⁶.

Numerous studies and case reports have documented hypersensitivity to natural rubber latex since the first reported case, back in 1979. Cases of latex sensitivity in both the general population and health-care workers have risen dramatically since the 1990s. This new risk – attributed to the increased use of latex gloves by health-care workers following the introduction of universal precautions to protect against harmful infections – has led to the development of non-latex products.

Latex

In this article, the term 'latex' refers to natural rubber latex and includes products made from dry natural rubber.

There are two types of latex: natural and synthetic. Natural

latex is contained in the milky liquid or sap produced by the *Hevea brasiliensis* tree, discovered in the 1700s by European explorers in the jungles of central and South America. In the 1800s, seeds from this tree were brought back to England, cultivated and transported to the British colonies of south-east Asia to develop large plantations. The milky sap is 30 per cent latex, 60 per cent water, 7 per cent resins and 3 per cent proteins. When the sap is processed, preservatives such as ammonia and sulfites are added immediately to prevent auto-coagulation. Also during conversion of the liquid natural rubber latex into the finished product, many accelerators (thiurams, mercapto group and carbamates), antioxidants, emulsifiers, stabilisers, extenders, colorants, retarders, stiffeners, ultraviolet light absorbers and fragrances are added². The final product contains 2-3 per cent latex proteins, some of which can cause a range of mild to severe allergic reactions. It is still difficult to identify which proteins are responsible. Recent research has identified 240 different proteins, 52 of them allergenic; of the latter, 10 are major allergenic proteins⁷. Chemicals added in the processing phase of manufacture can also cause skin rashes.

Synthetic latex – produced by the Americans during World War II following the invasion of south-east Asia by the Japanese, which cut off America's supply of rubber – is made up of the petrochemicals butadiene (gas from crude oil) and styrene (liquid from coal). Several other types of synthetic rubber are referred to as 'latex' but do not release the proteins that cause allergic reactions. In many cases, too, manufacturers combine natural and synthetic latex in their products.

Increase in Latex Allergies

Latex sensitivity (contact dermatitis) was reported in Germany as early as 1927¹. However, the first report of latex allergy did not appear in the medical literature until 1979. Since 1989 the number of cases reported has steadily increased⁸. Although the reasons for this are unclear, it is suggested that the following have played a part:

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- increased use of latex gloves following the introduction of universal precautions to protect health workers from body fluids contaminated with infectious diseases, particularly the AIDS virus ⁹;
- a severe shortage of rubber due to political conflict in Liberia, one of the world's leading producers of rubber ¹⁰, and
- a change in manufacturing procedures to keep up with demand – this involves speeding up the process by decreasing washing time, an important step in eliminating proteins and chemicals in the latex ⁸.

Classification of Latex Allergy

There are two types of latex allergy: type I and type IV. A type I IgE response is the most serious and can result in respiratory arrest. It is generally a response to the protein antigen in a latex product. Symptoms, which are immediate, range from skin red-ness, hives or itching to more severe reactions involving the respiratory tract: coughing, wheezing and difficulty in breathing. Shock can occur and a life-threatening situation may eventuate. Such reactions are similar to those seen in some people after a bee sting.

A type IV reaction is less serious and more localised, causing skin irritation and discomfort. The response is mainly to the chemicals within the latex product. Symptoms of a rash begin 6 to 72 hours after contact (allergic contact dermatitis) and may progress to oozing blisters or spread away from the area of skin touched by the latex.

Although hypersensitivity reactions rarely progress from type IV to systemic type I reactions, it has been reported that skin breakdown in contact dermatitis may facilitate protein absorption and the development of a type I reaction ¹¹.

When discussing types of latex allergies, some authors refer to three types and include irritant contact dermatitis as the most common – sufferers present with dry, itchy and irritated skin surfaces, generally on the hands. However, irritant contact dermatitis is not a true allergy ¹².

Risk Factors

Those at risk of latex allergy include the following:

- people who have undergone multiple intra-abdominal or genito-urinary surgical procedures, especially where these begin in infancy, as with spina bifida; also, individuals who have suffered spinal cord trauma and undergone multiple procedures such as bladder catheterisation (prevalence 12-73 per cent);

- health-care workers, who may suffer occupational exposure (prevalence 3-17 per cent);
- workers in the rubber industry (prevalence 11 per cent);
- those with a history of multiple allergies, and
- people with an allergy to foods such as avocados, bananas, kiwi fruit and chestnuts – researchers believe it may be a problem of similarity and mistaken identity, since, for the immune system, these foods are extraordinarily similar to the latex protein and it therefore responds as it would to that protein ¹⁰.

Testing for Latex Allergy

Latex allergy should be suspected in anyone who develops certain symptoms after latex exposure, including nasal, eye or sinus irritation, hives, shortness of breath, coughing, wheezing or unexplained shock. As with any other disease entity, an initial diagnosis of latex allergy should be based on the patient's history and physical assessment, with laboratory testing as a confirmation or elimination of that diagnosis.

Although numerous tests for latex allergy are available – including blood analysis to detect antibodies through the use of RAST (radioallergosorbent) or the skin prick test – at present no extract for the skin test has been approved by the FDA. This lack of an approved material to identify latex-sensitive patients stems, in part, from the complexity of the product. Without an approved standard extract, test results cannot be considered reliable. Skin testing should be performed only at medical centres the staff of which are experienced and equipped to provide resuscitation and emergency drugs.

In February 1997, the FDA granted clearance to market a new laboratory blood test for latex allergy. That simple serum test – for example, the Pharmacia CAP system ¹³ – can identify immunoglobulin E antibodies (IgE) specific to latex allergies.

Treatment

For health workers, the best way to control the increasing problem of latex allergy is by prevention and education. Prevention is necessary for both providers and receivers of health care. Where treatment is necessary, it is based on complete avoidance of the offending allergen, coupled with intensive patient and staff education on potential sources of exposure ¹. Treatment options can range from the prescription of antihistamines to full resuscitation for anaphylaxis. For those hypersensitive to latex, antigen avoidance remains the principal form of management ¹⁴.

Recommendations

The National Institute for Occupational Safety and Health USA has issued educational material – aimed at both the general public and health-care workers – on how to prevent allergic reactions to natural rubber in the workplace. The following recommendations have been adopted from that material ¹².

- Employers must put in place policies that protect workers from undue latex exposure; for instance, providing non-latex gloves for use where there is little potential for contact with infectious materials.
- Use of low-protein, powder-free gloves should be considered where barrier protection from infectious material is required. Studies confirm that the cornstarch powders used on latex gloves bind with the natural latex antigen in the product and may contribute to measurable levels of latex in ambient circulating air.
- Good housekeeping practices must be instituted to remove latex-contaminated dust from the workplace (for instance, from upholstery, carpets, ventilation ducts and plenums).
- Education programs and training on latex allergies should be provided for workers.
- Workers at risk of developing latex allergy should be screened periodically – detecting symptoms early and removing symptomatic workers from latex exposure are essential in preventing long-term health effects.
- Current prevention strategies should be re-examined whenever a worker is diagnosed with latex allergy.
- Workers can use appropriate work practices to reduce the chance of a reaction to latex. For instance, when wearing latex gloves, oil-based hand creams or lotions should be avoided, and hands should be washed with mild soap and dried thoroughly once latex gloves are removed.
- Workers who develop symptoms of latex allergy – a skin rash, hives, flushing, itching, nasal, eye or sinus symptoms, asthma or shock – should avoid direct contact with any latex products, report the problem to their employer or staff clinic and seek medical advice urgently.
- Those allergic to latex must wear a medical alert bracelet.
- Health-care workers must include, as part of their assessment of patients, questions relating to latex allergies.

- Within hospitals, policies on the care of latex-sensitised patients must be implemented.

Conclusion

The onset of latex allergy is insidious – it sometimes takes months or even years for clinical symptoms to manifest. Even though manufacturers have now adopted safer production methods, it is too late to reverse the damage done to medical professionals exposed to natural latex gloves. Latex-specific IgE may already have established itself within this group, since more and more medical and nursing staff are discovering their sensitivity to latex. Once a person is sensitised, total avoidance of all latex (rubber) products is necessary, both in the general environment and health-care settings. As a result, sufferers of latex allergy are faced with dramatic lifestyle and career changes. Latex allergy is not just an issue at work; once diagnosed, it becomes a **total lifestyle** issue.

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Useful Web Sites

- Ansell Healthcare Division, Research at <infoasia@ansell.com>.
- Pharmacia and Upjohn Diagnostics Division at <webmaster@pslgroup.com>.