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Latex Allergy: When 'Protection' Becomes the Problem

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This article reviews the background of latex use and the etiology of latex allergies. Latex allergy cases and current trends are also discussed. As latex use increases, legal nurse consultants may encounter more cases that involve latex allergies.

Before 1987, reports of latex allergy cases were sometimes found in medical literature. After 1987, the incidence and reporting of this serious health threat dramatically increased because of the adoption of Universal Precautions by the Centers for Disease Control and Prevention (CDC) and the loss of Liberia as a supplier because of internal political problems (Dyck, 2000). Universal Precautions recommend that protective barriers (e.g., gowns, gloves, protective eyewear) be used to reduce the risk of exposing heathcare workers to potentially infectious materials. Thus, it follows that a number of individuals with latex allergies are healthcare workers. In addition, food service workers and other individuals frequently exposed to latex gloves and other latex-containing products (e.g., individuals who have undergone numerous surgeries or medical procedures) also experience a higher incidence of latex allergy than the general population. However, latex allergies are also a growing concern for individuals who do not fit these demographics. This article reviews the etiology of the allergic reaction as well as current trends, including the use of the legal system to seek compensation or legal remedy for the allergic individual.

Walbaum reported the earliest documented use of gloves or glove-like apparatus in the medical community in 1758. Sheep cecum was fashioned into gloves before the introduction of rubber by explorers in Central and South America. Cook used rubber for surgical gloves in 1834, yet it was another 10 years before Goodyear, founder of Goodyear Tire, developed the process of vulcanization, making rubber more stable in a variety of temperatures—a requirement for use in the rubber glove industry. Halstead of Johns Hopkins Hospital is often credited with the introduction of the first sterile latex reusable glove in the operating room (Dyck, 2000; Edlich, 1997).

A major complaint about these early gloves was that they decreased the wearer's sensation. However, that complaint was diminished in 1928 when the process of dipping latex was developed, resulting in thinner, stronger gloves. These gloves were washed, lubricated, and resterilized (Dyck, 2000; Edlich, 1997).

In the mid 1960s, single-use, disposable latex gloves became more common. The increased popularity was due to the distinctive traits including strength, elasticity, tear resistance, and barrier quality (Dyck, 2000; Edlich, 1997).

As the value of gloves in protecting healthcare providers and patients from microorganisms was increasingly recognized, latex glove use spread from operating rooms to the rest of the healthcare community. In 1987, the CDC and the Occupational Safety and Health Administration (OSHA) issued their statement about Universal Precautions in an attempt to prevent the transmission of HIV in healthcare settings. This statement was adopted as policy throughout the United States and other countries, leading to a significant increase in the demand for sterile latex gloves (CDC, 1987).

Glove demand exceeded supply. Inexperienced manufacturers attempting to meet the increased production quotas resulted in poor quality gloves flooding the market. Not surprising, the reports of allergic reactions began to soar (Dyck, 2000; Edlich, 1997).

Etiology

To better understand the development of an allergic reaction to latex, it is important to know that latex, or natural rubber, is a protein-based product. Repeated or prolonged exposure to certain proteins in latex eventually leads to the development of an allergic reaction in susceptible individuals (Edlich, 1997). In addition, many gloves contain a powder that is used as a lubricant to help individuals put on and remove the gloves. This powder increases the likelihood that someone will become sensitive to the proteins in the latex because the proteins bind to the powder (Dyck, 2000; Edlich, 1997). Prolonged skin contact and moisture associated with sweating increases the body's latex protein absorption. In the 1970s, manufacturing changes included a switch from talc powder to cornstarch, a light powder that can remain suspended in the air. The cornstarch powder and protein combination is more readily released into the air as the gloves are donned, doffed, or discarded after a procedure. When inhaled, the powder-protein combination may make a person more sensitive to latex because mucous

membranes are one of the most direct routes into the body. The use of powder-free gloves has been shown to significantly reduce the exposure to allergy-triggering proteins in latex gloves (Dyck, 2000; Edlich, 1997). In addition, the introduction of low-protein gloves has decreased incidents of latex allergic reactions. Substitutes for latex have also been introduced and are readily available. These latex-free gloves tend to be thicker and, therefore, render the user's touch less sensitive.

Levels of latex sensitivity

There are three recognized levels or stages of sensitization to latex. These are contact dermatitis, contact urticaria syndrome, and systemic reactions. Within each stage the degree of symptoms vary and it is believed that early recognition and diagnosis of sensitivity may prevent evolution of the process to more severe stages.

Contact dermatitis

Contact dermatitis accounts for the vast majority of all new cases and results when a foreign substance (i.e., latex protein, protein-powder combination, or other chemicals used in the manufacturing process) causes a reaction and skin damage. This stage is characterized by a rash, or chapped and reddened skin or both in the areas that are in direct contact with the latex product (Edlich, 1997).

Contact urticaria syndrome

Contact urticaria syndrome may also be called allergic contact dermitits or type IV delayed hypersensitivity. This type of reaction is similar in appearance to the typical poison ivy reaction with blistering, itching, and lesioning. Like poison ivy, this dermatitis may appear sevaral hours or days after exposure. Hives may be present and affected individuals may complain of some chronic or recurrent respiratory symptoms including rhinitis, sinus infections, or asthma, all of which tend to be more apparent during exposure periods, but improved when exposure is reduced or eliminated (Edlich, 1997; U.S. Dept. of Labor, 1999).

Systemic reactions

Often called type I hypersensitivity, this level of allergic reaction is a true immunoglobin E (IgE)/histamine-mediated allergy. IgE is an antibody produced in the plasma cells in response to invading antigens. IgE triggers the release of histamine and other mediators when production is initatied by the introduction of antigens, in this discussion, latex-protiens. Although there can be some localized symptoms at the point of contact, such as hives, this is the type of allergic response that commonly affects the entire body. The route of contact (i.e., skin contact versus inhaled exposure of the powder-latex combination) will often dictate the degree of reaction. Symptoms can range from localized hives to systemic hives involving the face and throat, coughing, wheezing, shortness of breath, even shock and death. Although these may represent the first reaction a sensitive individual has to latex protein exposure, reactions generally progress from contact dermatitis to respiratory symptoms over a period of years (Edlich, 1997; U.S. Dept. of Labor, 1999).

Diagnosing latex allergies

Careful history taking is the first step in diagnosing latex allergies. Individuals who have had frequent contact with latex are at increased risk. It is crucial to thoroughly review the history for what may appear to have been past allergic reactions. Skin prick testing is a rapid and cost-effective means for confirming latex allergy, but it must be done by a trained allergist in a medical setting where resuscitation services are immediately available, as anaphylaxis can occur. *In vitro* testing for latex-specific IgE is complicated by the variability in processing. Therefore, there is potential for cross-reactions with other antibodies and false-negative and false-positive results may occur (Edlich, 1997; Dyck, 2000; America's College of Allergy and Asthma, n.d.).Testing is being developed and refined to improve the accuracy of diagnosing latex allergy.

Treating latex allergies

The gold standard for treating latex allergies is avoiding latex. Because latex is prevalent in many products, the feasibility of avoiding it is questionable.

Latex can be found in many medical and dental products, as well as household items such as clothing, cosmetics, tapes, bandages, balloons, condoms, diaphragms, baby bottle nipples and pacifiers, rubber balls and other toys, carpet backing, and automobile and bicycle tires (CDC, www.cdc.gov/niosh/latexalt.html).

In addition, certain foods have been identified to have a cross reaction with the allergy-triggering proteins in latex (America's College of Allergy and Asthma, n.d.; Goldblum, 2001; Jennings, 1999). These include avocados, bananas, chestnuts, kiwi, tomatoes, and potatoes. The mechanisms behind this cross-reactivity involve naturally occurring plant proteins as well as "defense-related proteins," which some plants produce in response to environmental stresses and disease. Food listings can be found on numerous Web sites, including www.latexallergyresources.org. This Web site also has resources for latex-free products and educational materials oriented to both the healthcare professional and patient.

Legal implications

As the number of latex-allergic individuals increases, opportunities for compensation and legal remedies also increase. These opportunities include

- Action against manufacturers of defective or dangerous gloves
- Action against employers or healthcare providers when a known latex-allergic individual is exposed to latex-containing products

- Workers' compensation claims, depending on individual state laws
- Failure to diagnose latex allergy and provide appropriate support or intervention

A recent federal court jury in Philadelphia held that a registered nurse with a latex allergy was not protected under the Americans with Disabilities Act (*Scanlon v. Temple University*). Scanlon, employed as a nurse by Temple University Hospital, alleged that she was terminated because of her allergy and that her employer failed to provide reasonable accommodations by not providing a latex-free work environment. The jury agreed with the defense that argued that Scanlon could find other work as a nurse in a latex-free environment. In addition, because her symptoms could be controlled avoiding latex and using medications, her allergy did not qualify as a disability.

The first latex allergy case to be tried in federal court (*Kennedy v. Baxter Healthcare Corp.*, No. 97-CV1773 [D. Minn.]) ended with the jury absolving the glove manufacturer of any liability. In this case, Kennedy, a former nurse, claimed that she could never work again or even leave her house for fear of dying in reaction to latex exposure from Baxter's medical gloves. She argued that design defects led to unreasonable exposure of high levels of latex proteins and other allergens. In addition, she argued that the manufacturer should have warned of the potential hazard. Baxter argued that Kennedy had multiple pre-existing allergies, which more likely contributed to her medical condition. Baxter also argued that it had reduced the latex protein and other allergens in its gloves as soon as technology was available to do so. Finally, Baxter brought in former Food and Drug Administration officials who testified that the agency did not want warning labels on gloves as they were concerned this would decrease use during the HIV/AIDS epidemic.

A more detailed listing of latex allergy litigation can be found at: http://latexallergylinks.tripod.com/lit.html.

Terrorist actions in 2001 in the United States, including anthrax-laced mail, led to an increased demand for gloves. Employers provided postal workers and baggage inspectors with gloves. Lessons learned from the healthcare industry's use of powdered gloves should prevent the development of a new group of sensitized individuals, but this serious and costly problem may not be well recognized. Despite a press release in October 25, 2001, wherein the United States Post Office reported that it had purchased 86 million pairs of vinyl and Nitrile (high-grade plastic) gloves for use by its employees, postal employees have been observed to use powdered latex gloves. Glove use is not mandatory, but is encouraged. Healthcare professionals have an opportunity to educate clients or patients and their families about latex allergies and avoidance. Healthcare professionals often interact with patients who are at higher risk due to frequent exposure to latex products. Healthcare providers should extend their roles as educators into their communities when they encounter powdered latex glove use in airports and post offices.

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Correction

In the October 2002 issue of *The Journal of Legal Nurse Consulting*, a quote on p. 2 was incorrectly attributed. The quote should have been attributed to Will Rogers. We regret the error.