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Type I Versus Type IV Allergic Reactions: How do they Differ?

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There are three types of reactions to natural rubber latex: Irritant contact dermatitis, type IV (delayed) hypersensitivity, and type I (immediate) hypersensitivity. It is useful to occasionally review the differences between the three, since latex avoidance is critical to those who have latex allergy. While it?s important to be aware of potential sources of natural rubber latex in the environment, understanding the difference between type IV and type I reactions can decrease the stress of vigilance.

Irritant Contact Dermatitis is a common reaction and is not an allergy. Itchy, dry, and irritated hands are the result of frequent hand washing and incomplete drying, use of hand sanitizers, and friction irritation from glove powder. Anyone who wears powdered latex gloves can develop this; however, in atopic individuals, contact dermatitis can be a sign of impending hypersensitivity if exposure to latex continues.

Type IV (delayed-type) Hypersensitivity is usually a sensitivity to chemicals used to make gloves, rather than to proteins from the natural rubber itself. Numerous chemicals are used in the manufacturing process, including antioxidants, emulsifiers, stabilizers, accelerators, stiffeners, colorants, and fragrances. Any of these can cause a contact dermatitis 24-48 hours after exposure, which can spread to other areas, including the face, if touched. Symptoms usually resolve spontaneously. Type IV hypersensitivity is also called allergic contact dermatitis, T-cell-mediated allergy, or chemical allergy. It is estimated that 80% of people who develop type I reactions experienced type IV reactions first. Approximately 7-18% of the population has type IV hypersensitivity.

Type I (immediate-type) Hypersensitivity is an allergy to natural rubber latex (Hevea brasiliensis) proteins that occurs as a response to exposure. Vasoactive mediators such as histamine are released, causing a spectrum of clinical symptoms including, among others, hives, nausea, abdominal cramping, and facial swelling with itchy, watery eyes.

Emergency treatment for anaphylaxis may be required, and anyone who has experienced a type I reaction

attributable to latex exposure should wear a medical ID bracelet and carry an EpiPen. Type I reactions affect less than 1% of the population.

So how does one know what kind of reaction is occurring? Type IV reactions, so far, have not been life-threatening and tend to be localized near the area of contact. In contrast, type I reactions tend to be systemic and can be life-threatening. Chronic dermatitis may be a sign of chemical sensitivity to other components besides latex protein. Atopic individuals are susceptible to latex allergy, but they are also predisposed to other allergies. This may require further testing by an allergist, or a dermatologist who can prescribe topical medications to control chronic dermatitis.

Those with type I hypersensitivity should avoid latex allergen exposure and they should also be aware of chemical-induced delayed reactions that can be confused for reactions to latex proteins. Keeping a written record of reactions and their causes can help differentiate life-threatening Type 1 reactions from merely annoying Type IV reactions, and it can help physicians offer more targeted treatment.

References

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Note: The general facts of latex allergy have not changed much since the1990s, but for the most up-to-date research information, go to the American Academy of Allergy Asthma & Immunology website:**www.aaaai.org**[2]

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