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Short Communication

Latex Allergy: Do we need to worry?

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ABSTRACT
Latex allergy is an important health problem in selected population groups, who are called risk groups. Health care workers constitute a risk group, particularly those working in laboratories, nursing, surgeries or anesthesia. The incidence of latex allergy increases with the degree of exposure. The clinical manifestations has great variability and can range from a skin rash to life-threatening reactions. Early recognition of symptoms can avoid severe reactions in the future. Primary preventive measures are the most effective way to reduce sensitization and are responsible for the great reduction in the number of cases at countries that have chosen to exclude latex from medical materials.

Keywords: Risk groups, latex hypersensitivity, gloves.

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Latex allergy is a common occupational issue among health care workers (HCWs), particularly those working in laboratories, nursing, surgeries or anesthesia, who are a risk group for latex allergy. The clinical manifestations has great variability and can range from a skin rash to severe anaphylaxis. The main risk group for latex allergy are patients with neural tube defects such as spina bifida, who undergo to multiple surgeries (FERNANDES, BITU, VIOLANTE JÚNIOR, 2006; GASPAR, FARIA, 2012; CABAÑES, IGEA, DE LA HOZ et al, 2012). According to the literature, the prevalence of latex sensitization in the general population is approximately 1% and in health care professionals range from 2.9% to 12.1% (LISS, SUSSMAN, 1999).

The use of latex gloves was further increased by the policy of universal precautions formally proposed in 1987 against AIDS and other transmissible infectious diseases such as hepatitis B. Thus, natural rubber latex (NRL) allergy is identified as an increasing problem by the 80's, with greater increase in the 90's (CENTER OF DISEASE CONTROL AND PREVENTION 1987; 1989).

Natural rubber latex is obtained from the Hevea brasiliensis, a tree of the Euphorbiacieae family, also known as "rubber tree". Crude latex is collected in amoniated solution to prevent microbial grow and is a mixture of cellular proteins, lipids and amino acids. So far, 14 Hevea brasiliensis proteins (latex allergens), designated Hev b 1 to Hev b 14, have been identified and characterized. Given its plant origins, latex has panallergens and constitutive allergens that can induce hypersensitivity reaction type I (IgE mediated) (CABAÑES, IGEA, DE LA HOZ et al, 2012; YEANG, 2004; RIHS, RAULF-HEIMSOTH, 2003; YEANG, CHEONG, SUNDERASAN et al, 1996; KURUP, YEANG, SUSSMAN et al, 2000). It is well known that some of the panallergens has cross-reactivity with fruits/vegetables. The structural homology between latex and fruits/vegetables proteins is responsible for the cross-reactivity between them. This clinical entity is known in the literature as the Latex-fruit syndrome (IgE mediated) (BREHLER, THEISSEN, MOHR et al, 1999). The association between latex and fruits/vegetables allergy is variable, depending on the studied country, diagnostic criteria and eating habits. Foods frequently involved in the syndrome are chestnut, avocado, banana, kiwi and manioc (SANTOS, GADERMAIER, VEJVAR et al, 2013; BLANCO, 2003; BEEZHOLD, SUSSMAN, LISS et al, 1996). Type I IgE-mediated hypersensitivity typically occur after minutes of latex exposure in individuals previously sensitized (Table 1) (KAHN, PODJASEK, DIMITROPOULOS 2016).

Moreover, since rubber deteriorates by oxidation with time, antioxidants are incorporated in the final rubber products to prevent the polymer chain degradation. Current antioxidants include thiocarbamates, diphenylamines, dihidroquinolines and phenylenediamine. All of them are potential contact allergens that induce type IV hypersensitivity reactions (cell mediated), which typically occur 24-48 hours after latex additives exposure in individuals previously sensitized (Table 1) (KAHN, PODJASEK, DIMITROPOULOS 2016).

Table 1. Types, causes and clinical presentations of latex reactions.

Type of reaction		Cause	Clinical presentation
Immunologic reaction	Type I	Latex proteins	Occur after minutes of latex exposure. Can induce: contact urticaria, generalized urticaria, pruritic, rhinitis, conjunctivitis, asthma, anaphylaxis, anaphylactic shock.
	Type IV	Additives in the rubber manufacturing process	Occur after 24–48 h contact. Can induce: allergic contact dermatitis with erythematous, scaly plaques, pruritic, possible vesicles and crusting on the dorsal hands. At the chronic fase, occur lichenified plaques.
Non-immunologic reaction		Occlusion, moisture accumulation, mechanical irritation, high glove pH	Also named irritant contact dermatitis. Can induce: erythematous, scaly plaques and fissures on the dorsal hands and interphalangeal digits.

Adapted from Kahn, Podjasek, Dimitropoulos 2016.

Repeated contact or prolonged exposure to latex containing products may result in sensitization and latex reactions in the future. Latex exposures in the medical setting occur mainly with gloves, but also with catheters, endotraqueal tubes, nasogastric tubes, operation room masks, hats, shoe covers, oxygen masks and rubber bands. Therefore, gloves are the main cause of latex sensitization (KAHN, PODJASEK, DIMITROPOULOS 2016).

The incidence of latex allergy increases with the degree of exposure. Airborne latex allergens in environmental concentrations are capable of induce sensitization through various routes of exposure and clinical reactions. Aerosols of lubricating glove powder associated with natural rubber latex allergens can impact on mucus membranes (eyes, nose, trachea, oropharynx and small airways). Skin is another important route of exposure. Mucosa of the gastrointestinal and urogenital tract can also be exposed to natural rubber latex allergens by direct contact, such as catheters (KAHN, PODJASEK, DIMITROPOULOS 2016).

Latex allergy is often diagnosed only after a patient has had severe potentially life-threatening anaphylactic reactions, because of the great variability of clinical manifestations. The complementary diagnosis is based on skin tests and the determination of serum specific IgE to latex. A positive result in any of these methods is indicative of sensitization to latex (NIETO, MAZÓN, ESTORNELL et al, 2000).

Primary prevention should be offered to patients and health care workers who are risk groups. Physicians have to use gloves only when necessary, avoid powdered latex gloves and always use synthetic gloves with allergic patients (CHAROUS, BLANCO, TARLO et al. 2002). Grzybowski et al. reported that the risk of sensitization was significantly lower among users of non-latex gloves than among users of latex gloves (odds ratio 0.2; $P < 0.001$) (GRZYBOWSKI, OWNBY, PEYSER et al, 1996).

Secondary prevention should be offered in both sensitized and allergic patients. Although difficult, the most effective approach is avoidance. Therefore, changes in the use of latex at home, school, work and in the health care setting should be considered (CABAÑES, IGEA, DE LA HOZ et al, 2012).

There are alternatives to latex for most rubber objects, which include neoprene, polyvinyl chloride, silicone, polyurethane, and vinyl. Nitrile (acrylonitrile butadiene) gloves provide protection against infection comparable to that offered by latex gloves (REGO, ROLEY, 1999) and similar permeability against cytotoxic agents (WALLEMACQ, CAPRON, VANBINST et al, 2006). For surgical procedures, synthetic polymers such as neoprene (polychloroprene), polyisoprene, butadiene and elastiprene are recommended, given their biomechanical and barrier properties. However, their use is limited as they are more expensive (REGO, ROLEY, 1999; WALLEMACQ, CAPRON, VANBINST et al, 2006).

Therefore, latex allergy is considered an important health problem in selected population groups, the risk groups. Potentially life-threatening reactions may occur. Primary preventive measures are the most effective way to reduce the sensitization and are responsible for the great reduction in the number of cases at the countries that have chosen to exclude latex from medical materials. Thus, early identification, establishment of preventive measures and appropriated treatment are essential in order to ensure correct management of patients who are allergic to latex.

CONFLICT OF INTEREST

The authors declares there is no relevant conflict of interest.

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