

## MANAGEMENT OF LATEX ALLERGY PATIENTS: A COMPREHENSIVE REVIEW FOR DENTAL PRACTITIONERS

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### ABSTRACT:

Latex allergy has been rightfully coined as the major health concern of the decade, as the general population is frequently exposed to latex and its products in both commercial and domestic use. Latex allergy is an allergic reaction to the natural proteins in the natural latex rubber. High risk groups include rubber industry workers, health care professionals and patients with congenital anomalies such as spina bifida allergies to multiple food products. The effective diagnosis is the first step in management of latex allergy. The definitive diagnosis can be made only after consideration of the individual's clinical history and confirmatory in vivo and in vitro laboratory tests. However, suspecting latex allergy keeps practitioners vigilant about the consequences. Universal precautions set a standard for blood and body fluid precautions stating that latex gloves are mandatory component of universal precautions and act as a deterrent to the transmission of pathogens. Universal precautions have increased the exposure of health care workers and patients to latex products. This article reviews the risks of latex allergy and proposes strategies for prevention and management in a dental and hospital set up.

**Keywords:** Latex allergy, hypersensitivity, anaphylaxis, urticaria, spina bifida cystica, angioedema



### INTRODUCTION:

William Halstead introduced surgical gloves in 1890. The perks of precaution is not something which is neither unheard nor familiar. The latex glove manufacture is carried out as follows; Natural latex is harvested from rubber trees (*H.brasiliensis*). Chemicals are added and centrifuged to remove water. Processing is done by the addition of chemicals such as accelerators and antioxidants. Glove shaped porcelain formers are then dipped into the emulsion of the compounded latex and then pulled into coagulation oven. Some gloves are

pretreated with cornstarch powder as a detaching agent. After emerging from the oven the gloves are dipped in water bath to leach excess chemicals and water soluble proteins<sup>[1, 2]</sup>. With safety comes a price to pay. And in this case, unfortunately we pay back it in the form of allergies. Latex allergy, both immediate and delayed<sup>[2]</sup>, pose a serious threat to the healthcare field<sup>[3]</sup>. Timely diagnosis<sup>[4]</sup> and intervention with the advent of science and technology has turned out to be a true blessing.

### Types of latex allergy:

Two types of latex allergic reactions to rubber products are known: Type 1 – Immediate type and Type 4 – Delayed type of hypersensitivity(DTH). Immediate reactions are IgE mediated and may be life threatening<sup>[2]</sup>. Latex allergy has resulted in death, progressive asthma and severe food allergy resulting from cross reactivity.

IgE mediated allergy: Also known as Type1 hypersensitivity reactions. Immediate reactions are IgE mediated and may be life threatening<sup>[2]</sup>. It develops in latex sensitive health care workers as a result of mucosal contact, dermal contact or inhalation. Corn starch powder used as a lubricant may bind and aerolize this protein resulting in respiratory tract deposition resulting in asthma, rhinoconjunctivitis and secondary sinusitis. Maibach and Johnson categorized type 1 symptoms based on their severity:

- Localized urticaria in the area of contact.
- Generalized urticaria with angioedema.
- Urticaria with asthma, rhinoconjunctivitis and orolaryngeal and gastrointestinal symptoms.
- Urticaria with anaphylaxis<sup>[1]</sup>.

Cell mediated allergy: Also known as type 4 reactions. These are delayed local allergic reactions that are caused by the chemicals added to latex during its manufacture. These are true allergic reaction involving the immune system but is localized to the skin or mucous membrane<sup>[1]</sup>.

### Risk factors in development of latex allergy<sup>[2]</sup>:

- Occupational exposure to latex eg: health care workers.
- Multiple surgical procedures.
- Patients with congenital abnormalities. One of the highest risk groups for latex allergy is patients with spina bifida cystica<sup>[4]</sup>.
- Frequent mucosal exposure to latex – Dental treatment and dentists.
- Preexisting hand eczema.
- Atopy
- Female gender
- Fruit allergy

### Diagnosis and investigations for latex allergy:

Diagnosis begins with a detailed history of the patient and qualitative and quantitative tests.

**History:** Patients with a positive history of latex allergy require no further work up and can be treated with latex alternatives. History should include a

thorough medical history, history of atopies, food allergies and history of any undiagnosed reactions during anesthesia, surgery or dental work<sup>[1]</sup>. Occupational history helps identify repeated use of natural rubber products which can increase the individual's frequency and magnitude of latex allergen exposure.

### Quantitative and qualitative tests:

Two types of tests are utilized:

- Diagnostic confirmatory test: Skin test (puncture, intradermal), IgE anti latex serology.
- Provocation test: Glove use test (finger, glove, puncture); Inhalation challenge.

Definitive tests for latex allergy are in vitro and in vivo. In vivo are more sensitive and clinically relevant.

In vitro serologic tests such as RAST (Radio allergosorbent assay) can be performed to get an insight on the serum level of latex specific IgE. RAST has only 53% of sensitivity when compared to skin tests<sup>[4]</sup>.

Skin prick test is the most reliable test with a sensitivity of 90%-95%<sup>[4]</sup>. It's preferable to be done in an hospital setting to avoid anaphylactic reactions. The disadvantages of this test is no standard criteria has been set for this test. Though skin prick test is the gold standard of allergists, some researchers

have reported up to 2% of incidence of anaphylaxis<sup>[1]</sup>.

Provocation tests have been used in which a patient with suspected latex allergy is made to wear latex glove on one hand and a vinyl glove on the other for 15 minutes. Sensitivity is noted to be 90% but considered to be more dangerous in very allergic individuals<sup>[1]</sup>.

### Management:

Patients with Type 1 latex allergy can come into emergency department with a serious problem. Patients with type 1 latex allergy are extremely sensitive to latex products. Such patients should be treated in a latex safe environment. Patients can have an allergic reactions on the dental chair too as most of the dental products are latex based.

Treatment of acute reactions:

The whole management protocol depends on the degree of severity:

Mild reactions such as hives or irritation dermatitis can be treated with antihistamines and topical nasal steroids, if generalized reactions occur then systemic steroids can be given.

If anaphylactic symptoms are noted then the following drug regimen should be followed:

Antihistamines, steroids, H2 blockers, bronchodilators and possibly epinephrine. Immediate administration

of epinephrine aborts the anaphylactic reaction and saves the patient's life.

In case of angioedema of face and airway compromise is often a major complication of the systemic allergic reactions. The airway has to be secured with endotracheal intubation. In case of severe anaphylactic reactions, life support should be provided as per the standard protocols.

In case of Oral and maxillofacial surgery patients, identification of latex allergy pre operatively is of extreme value. High risk patients can be isolated by a detailed case history. Task force of American Academy of Allergy and Immunology recommends that clinical testing should be done mandatory for the high risk groups. The management protocol can be divided into:

Pre-operative:

Examination should be done with latex free gloves/polyvinyl gloves. Polyvinyl gloves are comparatively difficult to don and inelastic. The blood pressure cuff can be used with a barrier of cotton swab or any barrier ointment.

Peri-operative:

Visible board signs have to be placed to notify as allergic to latex. The anesthetic and surgical equipments should be latex free, including masks, AMBU bags, cannulas, nasopharyngeal airways and ET tubes. Glass syringes can be used as an alternative to the regular syringes. Other latex free

equipments should include tourniquets, orthodontic elastics, catheters, intravenous bags, bite blocks etc.

Post-operative:

The patient should be made to wear a tag notifying the latex allergy. The latex allergy board signs have to be placed around the patient area so that all the personnel involved in patient care are aware of the condition.

The emergency medicine cart required for the management of anaphylaxis has to be kept ready close to the patient to avoid delay in management of any emergency.

Even healthcare professionals who are allergic to latex should wear latex free gloves and also the personnel in the operating room should wear latex free gloves.

## CONCLUSION:

Latex allergy has been a fast emerging problem and an occupational health hazard. It is likely that we would be encountering more of these patients in the years to come. It is mandatory to have protocols and guidelines for management of latex allergy patients. It is advisable to have latex free products made readily available in case of an emergency. It is a good practice to suspect allergy when taking a detailed history. Patients allergic to multiple products and food or with congenital anomalies could be

likely allergic to latex too. Health care employees should undergo latex allergy testing as a part of regular medical examination on joining a work place as they would be handling most of the latex medical equipments.

Patients with documented hypersensitivity to latex can undergo a planned care. The hospital unit should work cohesively with appropriate

communication regarding the care of a patient with latex allergy. It's a good and safe clinical practice to treat hypersensitive dental and maxillofacial patients in a hospital setup.

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