

Contact allergic dermatitis and stomatitis in orthodontics – An orthodontic review

Dr. Ravi Kant Singh, Dr. Ragni Tandon, Dr. Kamlesh Singh, Dr. Pratik Chandra

PG Student¹, Professor & H.O.D. ², Professor³, Reader⁴ Department Of Orthodontics & Dentofacial Orthopedics^{1,2,3,4}, Saraswati Dental College, Lucknow^{1,2,3,4}

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Introduction

Elastics are commonly used in fixed orthodontic mechanotherapy and are made up of natural rubber latex which is white sap that is extracted from the hevea brasiliensis tree. Natural rubber latex, extract from sap of rubber trees contains proteins called allergens and these allergens cause serious problems including immediate hypersensitivity reactions. Adverse reaction to latex may be of non-allergic contact dermatitis, delayed type IV hypersensitivity, immediate Type I hypersensitivity and irritant contact dermatitis. This occurs due to immediate response to chemical additives present in latex products. Allergic reactions occurs in some people when they come in contact with latex, especially latex gloves. as presence of cornstarch powder in gloves causes attachment to allergens. Moisture present on the skin surface can accelerate this process. The particles becomes airborne and sensitive individuals are prone to these allergy causing particles on inhalation.^{1,2,3,4}

Types of reactions to latex products

Types of reactions seen in people who use latex products:

- Contact dermatitis by irritant
- Contact dermatitis by allergy
- Contact Dermatitis by both Irritant and allergy

Irritant contact dermatitis

Contact dermatitis by irritant is the most common type of dermatitis seen in response to latex containing products. It involves the formation of dry, irritated, itchy areas on the surface of skin, usually the hands but it is not a true allergic response. Use of gloves precipitates this kind of irritation and it also can happen due to exposure to other workplace products and chemicals. Repeated washing of

Abstract

Measures for infection control stresses the importance of using gloves and masks. But this has increased risk of danger due to latex exposure either by contact with skin surface or inhaled airborne particles amalgamated from gloves. Reaction ranges from mild contact dermatitis to potentially life threatening hypersensitivity. Rate of allergy shows increase with increased and repeated exposure to allergens arising from orthodontic products. The aim of this article is to find the sources of latex exposure and life threatening reactions arising from it and necessary corrective measures that need to be taken.

Keywords: Latex allergy, hypersensitivity, infection control, dermatitis, latex free products

hands and drying, incomplete hand drying, use of sanitizers and inhalation to powders present in the gloves can also cause severe type of reactions.

Allergic Contact Dermatitis

Contact dermatitis by allergy is a type of delayed hypersensitivity reaction. Reaction to harmful chemicals present in latex containing substances causes this form of dermatitis. These chemicals lead to skin reactions similar to allergic reactions for example. reactions for poison ivy which causes formation of typical rash. usually develops to skin blisters which oozes out or spreads away from the area of skin.

Contact Dermatitis by both Irritant and allergy

It is a serious form of skin reaction as compared to irritant contact dermatitis or allergic contact dermatitis. Proteins present in latex products contain some allergic substances which sensitize latex exposed patients. It is usually seen within minutes of exposure, but can also occur few hours later. Various symptoms that are seen are reddish skin, itching, irritation and some respiratory symptoms such as, sneezing, coughing, nose run, allergic rhinitis, asthma and shock.^{5,6,7}

Symptoms of latex allergy

Latex reactions may present as mild to serious type of skin reactions. These include:

- Reaction on skin surface by contact with allergen: dryness, irritation, hives, or itching.
- Respiratory symptoms: sneezing, coughing, nose run, allergic rhinitis, asthma and angioedema.
- Life-threatening reactions: anaphylactic reactions and shock.^{8,9,10}
- Symptoms may be extra-oral and intra-oral (Table 1 and table 2).

Table 1: Extra-oral symptoms of latex allergy

S.No	Immediate Type I hypersensitivity	Delayed Type IV hypersensitivity
1.	Erythema	Erythema
2.	Edema	Eczema
3.	Palpitation	Papules
4.	Bronchospasm	Vesicles
5.	Dizziness	Pruritis
6.	Gastrointestinal cramps	Weeping
7.	Vasodilation	
8.	Urticaria	
9.	Vomiting	
10.	Hypotension	
11.	Death	

S.No	Intra-oral symptoms
1.	Gingivitis
2.	Gingival hyperplasia
3.	Burning sensation in mouth
4.	Soreness at tongue
5.	Angular cheilitis
6.	Numbness
7.	Lip desquamation
8.	Loss of taste sensation

Table 2- Intra-oral symptoms of latex allergy

Risk factors for latex hypersensitivity Many patients can be susceptible to latex sensitivity. That is use of latex Gloves. including use of latex gloves, face masks with latex ties, elastomeric ligatures and use of rubber elastics for traction. Health care workers, rubber industry workers, and people who had history of multiple surgeries or medical intervention are more prone to latex hypersensitivity as latex equipments are used in these types of factories and industries. Allergic reactions such as eczema, asthma and hay fever develop mostly in children and adults.

Sensitization occurs on contact with natural rubber latex such as powdered gloves. (Table 3)

S.No	High Risk group patients
1.	Health care professional
2.	History of allergy
3.	Hay fever
4.	Spinal cord injury
5.	History of multiple surgeries
6.	Female gender
7.	Intestinal malformation

Table 3- high risk patients for latex hypersensitivity

Atopic individuals are associated with allergies to certain foods substances such as banana, potato, tomato, chestnuts, kiwi fruit, and papaya. People with spina bifida also carry chances for latex allergy.^{11,12,13,14}

Sources of latex exposure

Latex allergy occurs by use of various products used in orthodontic office (Table 4).^{14,15}

S.No	Sources of exposure to latex
1.	Gloves
2.	Syringes
3.	Bite blocks
4.	Face masks with rubber ties used in operative fields
5.	Suction tips
6.	Impression materials
7.	Air/water syringe tips
8.	Mixing bowls
9.	Orthodontic rubber bands
10.	Elastomeric power chain
11.	Elastomeric modules
12.	Polishing discs
13.	Polishing rubber cups

Table 4- Sources of exposure to latex

Levels and routes of exposure in latex allergic patients

The allergic protein attaches to powder which is found in latex gloves and when these powdered gloves are worn, these proteins reach the skin surface and causes latex allergy. Latex protein in form of powder particles becomes air borne and comes in contact with mucous membrane and body on inhalation, when gloves are changed. The development of skin rash may be the first sign which shows that a person has developed allergic response to latex and more serious reactions can be seen with repeated ongoing exposure (Table 5).

S.No	Routes of exposure to latex
1.	Vascular exposure
2.	Inhalation
3.	Cutaneous exposure
4.	Haematogenous exposure

Table 5- Types of exposure of latex allergen patients

- a) Vascular exposure involves intravenous delivery through latex syringes and tubing
- b) Inhalation includes aerosols from powdered gloves which later binds to latex allergens.
- c) Cutaneous exposure means direct skin contact which occurs by changing gloves multiple times and sweating of hands and use of lotions which increases the solubility of latex proteins.
- d) Haematogenous exposure means broken skin.

High vascularity and thin mucous membrane increases the risk of latex sensitization for patients.^{16,17,18}

Diagnosis of latex allergy

Diagnosis is done by taking a medical history, conducting physical examination, and performing tests. Blood test is done to detect latex antibodies and skin tests are performed by scratching the skin surface or pricking. Itching, swelling or redness at the site of skin indicates a positive reaction. Glove-use tests and skin tests should always be done by qualified and well experienced doctors.^{19,20,21,22}

Orthodontic considerations

1. Self ligation or ligation with steel ties is advised in latex sensitive patients.
2. Modify treatment plan and avoid use of class II or class III traction with elastics.
3. Refer the patient to dermatologist for clinical testing.
4. Store latex free products in latex screened area.
5. Reduce exposure to air borne latex by giving early morning appointments to patients.
6. Properly diagnose and observe signs of adverse tissue reaction.
7. Avoid the use of latex gloves since it contains latex allergens. Therefore, synthetic non-latex gloves made from vinyl, nitrile, silicone, and polychloroprene should be used.
8. Prescribed drugs should be free from latex.
9. Elastomeric separators should be replaced by self-locking separating springs.
10. Avoid contact of skin surface with any type of latex containing products.
11. Inhalation should be avoided in case of powdered latex gloves.^{23,24,25}

Conclusion

Latex allergy predisposes the patient to major life threatening situation due to frequent use of latex products in orthodontics in form of gloves, elastics, separators, elastomeric modules, band removers and masks with rubber ties. Proteins present in latex products are allergic in nature and precipitate different type of hypersensitivity reactions. People should have knowledge regarding signs and symptoms of allergy and proper management should be undertaken for well being of these patients. Therefore, sources and routes of latex exposure should be removed immediately.

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