

Latex Hypersensitivity Among Students in United States Dental Schools



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INTRODUCTION

Allergy to natural rubber/latex is an emerging public health issue, which must be recognized by health care professionals. The increased use of latex in the health care field has resulted in potential harm to patients and health care professionals. Dentists have a moral and legal responsibility to the public and the profession to prevent and react to the increased incidence of latex sensitivity.

Since the Occupational Safety and Health Administration (OSHA) mandated Universal Precautions in the late 1980's, latex sensitivity among health care workers has been on the rise.¹ Personal protective equipment in the form of eye protection, masks, and gloves has been recommended by the

ABSTRACT

The purpose of this communique is to raise the awareness of dental health care professionals to the issues of latex sensitivity. Its incidence and prevalence among dental professionals during their formative years in United States dental schools were studied. Clinical manifestations of allergic reaction, consequences of occurrence, and immune system response to latex protein were discussed. Emphasis was made of the need for educational efforts to implement precautionary measures, and early detection and management of latex allergy by dental schools and health care providers.

Center for Disease Control and Prevention as barriers against blood borne pathogens.² Unfortunately, an IgE mediated hypersensitivity reaction to natural rubber latex (NRL) proteins retained in cured latex products has become prevalent in health care workers.³ IgE is the antibody primarily involved in allergic reactions being one of five general classes of antibodies: IgE, IgA, IgD, IgM, and IgG. When the human body perceives an allergen as a foreign

invader, lymph tissues release IgE antibodies into the bloodstream. IgE attaches to mast cells that line the skin, nose, mouth, throat, eyes and lungs, causing them to release histamine, which in turn causes an engorgement of blood vessels, making them swell. This acute inflammatory reaction causes a more prolonged response that lasts from a few days to as long as one month, from a single allergen exposure.⁴ The potential for hypersensitivity to the

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Fig. 1. Contact dermatitis associated with latex glove bearing area of hand of 26-year-old female dental auxiliary.



Fig. 2. A close up of the finger appears in Figure 1 shows the extent of skin lesions.

NRL proteins is increased when they bind to the glove powders and become aerosolized with the removal of the glove, creating a mechanism for exposure and sensitization to latex allergens.⁵ Health care workers who experience latex sensitivity have the potential of developing severe allergic reactions, which may limit their careers, as well as normal daily activities.

Individuals most likely to develop an allergy to latex are those who are repeatedly exposed to latex products. Latex allergies are initially manifested by immediate or delayed erythema, skin rash (Figures 1&2), or blisters of oral mucosa (Figure 3), rhinoconjunctivitis or pruritis. The risk of progression from skin rash, urticaria, to more serious reactions such as asthma or anaphylaxis is unknown. However, more serious reactions could occur with continuing expo-



Fig. 3. Intra-oral photograph demonstrates desquamation of attached gingiva of a patient occurred 6 - 12 hours after contact with latex gloves.

sure.⁶ Prolonged periods of contact with latex that are required for most dental procedures, could exacerbate the allergic reaction.

The majority of health care workers with symptoms of latex allergy first contract local hand symptoms when using latex gloves.⁷ Urticaria resulting from contact with latex was first reported by Nutter in 1979.⁸ Since that time, documented reports of latex precipitated reactions continues to rise. While there are several therapeutic remedies for the clinical symptoms, such as topical steroids and antihistamines, there is no cure for latex sensitivity.

The relatively benign symptoms of dermatitis, hives, itching, and burning eyes may be viewed by health care professionals in general, and dental health care professionals in particular, as reversible symptoms that disappear readily when the sensitizing agent is removed. They may often fail to associate these symptoms with an allergic reaction that has a cumulative pattern with potential increased severity that could eventually end their careers or possibly their lives.

During the later half of the nineties the recognition of latex sensitivities among Health Science Center students at the authors' university was questioned, when it was determined that a relatively low number of cases of latex related problems were reported. This number was well below the incidence of latex sensitivities among health care workers reported by Safadi et al, 1996.⁹ In their study of oral health care workers in a

hospital setting, 38 percent reported a history of latex sensitivity, while only 12 percent tested positive to a skin-prick test. Furthermore studies on dental clinic personnel and dental students indicated a 12 - 18 percent incidence of latex glove reactions, based on surveys and skin testing.^{9, 10, 11} These reports that are pertinent to dental students, the future dental professionals, raised our concern. This concern was substantiated by Hamann et al in 1998 that indicated 6.2 percent of 1,701 dental professionals tested with a skin prick test, had an immediate, Type I, hypersensitivity to natural rubber latex.¹²

Among dental professionals, dental students, at the early formative years of their careers are at a high risk of developing latex allergies. The 1997 survey by Rankin of 413 dental students resulted in one third of the respondents reporting symptoms associated with latex. The percentage of students reporting symptoms increased across the four years of dental school (8, 13, 21, 26%).¹¹ Dermatitis and ocular irritation were among the most common symptoms reported. The results achieved were pertinent to the subject investigated; hence it affirmed the prevalence of latex sensitivity among dental students. However, due to the small number of student population involved and the absence of number of respondents to the survey, these data could not be representative of the latex sensitivity pattern among dental students nationwide. Identifying the incidence and prevalence among dental students in United States dental schools would place in focus the extent of this problem and potentially give rise to heightened awareness among dental schools, dental clinics, and private dental practices. Consequently, policies and protocols may be developed and implemented to manage this progressively developing problem in the dental health care field.

The objective of this study was to determine the identification and self-reporting incidences of dental students in United States Dental Schools with sensitivity to latex or a risk for allergy to latex products.

Methods and materials

A three-question survey was mailed to the Clinical Affairs Departments and Student Health Services of 53 United States dental schools with a total population of 16,369 students. The survey recorded the presence of schools' policies for managing students with latex sensitivity; the percentage of the dental student population that reported latex sensitivity; and the latex free alternatives available at the schools. A self addressed, stamped envelope was provided for a return response.

Results

Of the 53 dental schools surveyed with a total of 16,369 students, 52 schools with 15,933 students returned completed questionnaires for a response rate of 98.1 percent. Among the respondents, forty-four (84.5%) schools that had 12,561 students reported 538 cases of latex sensitivity; 7 schools (13.5%) affirmed that no data is maintained; and 1 school (2%) has established a latex free clinic.

The percentage incidence of latex sensitivity reported by the 44 schools in this study ranged from zero to 21 percent.

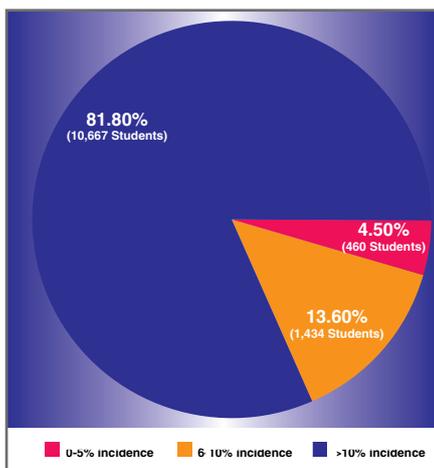


Fig. 4. Graphic representation of incidence and distribution of latex sensitivity among dental students in United States dental schools included in the present study.

Thirty-six schools (81.8%) reported a distribution of 0 - 5 percent incidence; 2 schools (4.5%) reported a distribution of 6 - 10 percent incidence; and 6 schools (13.6%) reported a distribution of greater than 10 percent incidence (Figure 4).

The adjusted mean of reported latex sensitivity of the schools surveyed is 4.2 percent, which is below the estimated prevalence of latex sensitivity in dental health care workers. There is no apparent geographical correlation of the data. Among the latex free alternatives reported were: latex free gloves and cotton tie masks.

Discussion

Kelly et al 1994, listed the methods used to determine the prevalence of latex allergy: a). Questionnaires to assess reactions to latex gloves; b). Medical histories of reactions to latex-containing products; c). Skin tests that include patch test, skin prick and intradermal; and d). Serologic test for IgE antibodies.³

The prevalence of reported latex sensitivity varied significantly depending on the method employed. Questionnaires and symptom reporting provided higher prevalence than serologic assays.⁹ The latter may produce a false negative result because not all latex proteins have been identified. For this study it was determined that surveying the dental schools nationwide was the most practical and economical method. The obtained data can be analyzed in light of the existing information derived from studies that employed a similar method. The analysis of the data collected in this study indicates that the percentage of dental students that reported signs of latex sensitivity (4.2%) is lower than that for dental health care providers established in practice (12-18 %).⁹ The difference between these means can be attributed to: a). absence of reporting mechanism by schools, b). underreporting by the students, c). potential influence of cumulative effect of latex exposure.

The data reported by individual schools varied significantly (0-21%). Three

schools, with 608 students, reported a zero percent incidence, while another three schools, with 737 students, reported a range of 18 to 21 percent. The disparity of the reporting provided by the schools indicates the possibility that some dental schools have no protocol in place for a reporting mechanism or they fail to educate their students to recognize, and report preliminary manifestations of latex sensitivity.

The underreporting by students can be attributed to multiple factors that include: ignorance of the cumulative allergic effects of latex exposure and severity of the potential reactions; unavailability of a readily accessible reporting mechanism at the dental schools; and lack of knowledge of the availability of latex substitution products. Additionally, while most dental students are solely focused on the completion of their dental school requirements, they fail to recognize the importance of any issue that does not directly impact the attainment of their final goal of graduation. This among other factors makes identification and diagnosis of latex sensitivity a difficult task, particularly if those individuals effected ignore the early symptoms.

Dental schools have a duty of care to educate their students and inform them of the recommendations provided by governmental agencies. The National Institute for Occupational Safety and Health has recently produced an advisory recommending the following measures: use non latex gloves for activities not likely to involve contact with infectious materials, and only use powder-free latex gloves with reduced protein content when necessary.¹³ These recommendations highlight the importance of symptom recognition and appropriate consultation. The Food and Drug Administration mandates that all medical devices be labeled as to their latex content beginning in 1998.¹⁴ Dental students must be informed of these recommendations and mandates in order to emphasize the hazards of latex.

Admittedly the contemporary dental curriculum is saturated with essential information for dental students' proficiency, however, topics that are critical to their health and well being must be

incorporated. Instructions related to the recognition of latex sensitivity and the severity of allergic reaction that could occur over repeated exposure to the latex proteins must be emphasized. Policies geared toward precautionary procedures must be followed to protect students, faculty, staff and patients from unnecessary latex exposure and developing or aggravating latex allergies. A simple, yet effective measure to reduce latex exposure is washing hands immediately upon removing the gloves, which removes residual latex proteins.

Protocols are also necessary to establish a direction and a method for handling latex allergies if they occur. These protocols should include identifying latex sensitive individuals, establishing a reporting mechanism, conducting allergy testing of any student with suspected or mild symptoms, and acquiring substitute products to latex. In service training by manufacturers of alternative glove materials is an effective educational process that informs the students of the diversification of available gloves that do not contain latex.

Alternatively, dental schools should consider converting all or part of their clin-

ics to a latex free environment. In response to the rise in latex sensitivity in health care workers and patients, the University of Iowa College of Dentistry, Oakdale Dental Clinic, has taken a leading role by converting its facilities to a latex-safe environment. Such action would serve the need of the latex sensitive patient population, as well as the latex sensitive dental students, faculty and supporting staff.

Dental students should be screened for latex allergy upon admission to dental school and throughout the four years of education. Identification of known or suspected latex sensitive dental students can be accomplished by student health services through medical histories, observing symptoms that occur while in school and through use of a latex allergy questionnaire that becomes part of the student's medical record. Those students who are in a high-risk category for developing an allergy, such as those with other allergies or individuals who require frequent surgery, must be closely monitored for reaction to latex. Students must be counseled at an early stage of their dental education about the consequences

of the allergen and its potential negative impact on their careers.

Hospitals nationwide are implementing latex policies to protect their patients and employees from developing and aggravating latex allergies. It is imperative that dental organizations and dental professionals recognize the need for such action, and the importance of implementing such policies.

Conclusion

Latex allergy has been known to be an occupational health hazard since the FDA issued an alert about latex containing medical devices including gloves, in 1991. The present survey results reflect the occurrence of latex sensitivity among United States dental students. Individuals, institutions and organizations must establish protocols to implement a direction and a method for managing latex allergies, and to prevent repeated exposure to themselves, their staff and patients.

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