

Latex anaphylaxis in healthcare worker and the occupational health management perspective: A case report

SAGE Open Medical Case Reports
Volume 11: 1–4
© The Author(s) 2023
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2050313X231179303
journals.sagepub.com/home/sco



Chatpong Ngamchokwathana and Naesinee Chaiear 

Abstract

Latex allergy is a critical occupational health problem in healthcare settings. Exposure to latex can lead to severe allergic reactions, including anaphylaxis. However, in epidemiological studies, occupational anaphylaxis due to natural rubber latex is relatively rare. For this reason, allergic reactions from latex exposure in the workplace may not be well aware and, therefore, lead to delayed appropriate management. We reported a female physician who sought occupational health program counseling for her latex allergic reaction following occupational exposure and her two episodes of latex anaphylaxis during medical-surgical procedures. An occupational health management program (e.g. glove replacement and a bracelet with latex allergy labeling) was established. After the intervention, she rarely experienced any allergic symptoms. Given these points, anaphylaxis can be triggered by occupational exposure to latex; thus, occupational health management is key to preventing and managing latex allergies in the workplace.

Keywords

Anaphylaxis, latex allergy, occupational health management, healthcare worker, natural rubber latex

Date received: 5 November 2022; accepted: 15 May 2023

Introduction

Natural rubber latex gloves have been used as personal protective equipment to prevent bloodborne pathogen infection since the 1980s. Subsequently, latex allergy became a more common occupational health problem, particularly among healthcare workers.^{1,2} The more healthcare workers are exposed to latex allergens in daily practice, the greater their risk of developing latex sensitization and allergy. In 2014, latex sensitization and allergy prevalence in the general population was 2.1% and 4.3%, while 12.4% and 9.7% for healthcare workers, respectively.¹

In the mid-1990s, latex allergy prevalence was as high as 17% among healthcare workers.³ Notwithstanding, the prevalence of latex allergy significantly decreased as latex gloves were replaced by low protein latex gloves, non-powdered latex gloves, and synthetic rubber gloves, particularly in developed countries where resources are less limiting and alternatives more readily available.^{2,4} By comparison, occupational health policies in developing countries, including glove replacement, are challenging due to economic constraints.⁵ In 2011, Boonchai et al.^{6,7} reported that 86% of Thailand's healthcare workers in tertiary hospitals used

powdered latex gloves and that latex glove-related symptoms were 13.3% higher than in other developed countries.

Exposure to latex allergen among individuals who have latex sensitization may experience a wide range of allergic symptoms from contact urticaria to severe manifestations such as anaphylaxis. Anaphylaxis is a life-threatening condition that can cause death from asphyxiation due to airway obstruction or cardiovascular collapse. Anaphylaxis can occur due to allergenic exposure in many settings, including at-home and workplace.⁸ The most frequently reported allergens in the workplace are natural rubber latex and Hymenoptera venom.⁹ However, work-related anaphylaxis is challenging to demonstrate as it is uncommon, poorly defined, and transient.¹⁰

Department of Community, Family and Occupational Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Corresponding Author:

Naesinee Chaiear, Department of Community, Family and Occupational Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.

Email: naesinee@kku.ac.th



The current report describes how a healthcare worker who suffered latex anaphylaxis developed latex sensitization and allergy from occupational exposure.

Case

A 39-year-old female physician visited the Occupational Health and Safety Office (OH&S) at the Faculty of Medicine Khon Kaen University (KKU) for counseling on her latex allergy problem. She had a history of two episodes of severe anaphylaxis due to latex exposure. In addition, she suffered from atopic dermatitis and controlled hypothyroidism since her childhood.

In 2001, in a surgical rotation, she was routinely assigned to assist the surgeon in the surgical field for 4 h a day. She regularly wore powdered latex gloves five pairs per day. As a result, she developed on-and-off vesiculopapular rashes, mainly on the dorsal side of both hands. She then applied a topical corticosteroid to control the disease.

In 2004, she worked as a physician and suffered from glove-related contact urticaria. Her skin manifestation was mostly wheal and flare on both hands and arms, with severe pruritic symptoms. She, therefore, decided to put on plastic gloves underneath the powdered latex gloves. However, the symptoms were commonly recurrent. As a result, she frequently used topical steroids to reduce her symptoms. In addition to the latex allergy, she developed allergic symptoms, including urticaria, itching, and flushing after contact with Kiwi, Jackfruit, Durian, Passion fruit, Mango, and Nam Wah Banana. However, she denied any skin prick test to confirm latex-fruit syndrome due to her previous anaphylaxis experience. In addition, as this patient is an internal medicine specialist, she confirmed her allergic reaction was caused by those fruits previously mentioned.

In 2013, she underwent a pelvic examination and suddenly developed flushing, syncope, and facial angioedema. She was diagnosed with anaphylaxis and was administered intramuscular epinephrine, intravenous dexamethasone, and chlorpheniramine. Her symptoms resolved, and she had no complications after 24 h. Following this anaphylaxis episode, she opted for neoprene gloves to replace the latex gloves, albeit her employer did not have any occupational health procedures to support the replacement cost.

In 2019, she underwent a computed tomographic (CT) colonography due to chronic constipation. Unfortunately, she developed a second anaphylaxis episode during the imaging immediately after rubber catheter insertion and prior to contrast media administration. She received emergency management for anaphylaxis and recovered without complications.

In 2020, she was admitted to the clinical fellowship program at KKU. She sought counseling at OH&S for evaluation and specific occupational health management of her latex allergy. According to ImmunoCAP (Phadia, Uppsala)—fluorimetric enzyme-linked immunoassay tests—her latex-specific IgE was 10.20 kUA/L with negative results on other atopic

allergens. She has been diagnosed with latex allergy with a history of two episodes of latex anaphylaxis.

In addition, OH&S has provided her with personalized occupational health programs, including personal synthetic glove replacements (i.e. nitrile and sterile neoprene gloves), preparation or prevention of possible recurrences (i.e. latex allergy labeling bracelets), and encouraging the use of non-powdered latex gloves among peer healthcare professionals to reduce airborne latex allergens. After these interventions, she has rarely experienced any allergic symptoms in the last 2 years.

Discussion

In the current report, we described the case of a female healthcare worker who experienced two anaphylaxis episodes during medical-surgical procedures. The chronological history of each episode was associated with latex exposure. Furthermore, the high level of her latex-specific IgE was strongly linked to her allergic history. Her anaphylaxis and allergic symptoms are thus due to latex allergy.

Latex allergy and sensitization are IgE-mediated hypersensitivity reactions caused by latex protein allergen exposure. Exposure to latex via the mucosa increases the chance of anaphylaxis since the contact more easily diffuses and aggravates the IgE-mediated hypersensitivity reaction than direct skin contact. A high dose of allergen and a specific route of exposure (like the mucosa) have serious consequences vis-à-vis IgE-mediated mast cell activation, which can develop into anaphylaxis.¹¹ The case had anaphylaxis episodes as a direct result of latex sensitization associated with latex-mucosal exposure.

A few risk factors are also significantly related to the onset of latex sensitization and allergy, including modifiable risk factors (e.g., duration, amount, and frequency of latex exposure) and non-modifiable risk factors (e.g., atopic disease, congenital anomalies).⁵ Frequent donning and doffing of latex gloves in medical practice increase latex allergen exposure, the risk of latex sensitization, and eventually latex allergy.² Latex-laden cornstarch in powdered latex gloves is an aeroallergen with a greater risk of latex allergen exposure via the inhalation route. Healthcare workers with atopic disease have double the latex allergy prevalence than the non-atopy group.³ Finally, latex-fruit syndrome—a cross-reaction between fruit (e.g. Kiwi, Mango, Banana, and Jackfruit) and latex allergens^{5,12}—is one of the associated concerns in this case given that the fruit allergy manifested subsequent to the latex allergy. Approximately 30%–50% of latex allergy patients also exhibit symptoms of latex-fruit syndrome due to the similarity in allergen structure between latex and these particular fruits.^{5,12,13}

Dealing with latex allergy problems in the healthcare setting should be considered from both the institutional and individual perspectives as shown in Table 1. For the institutional level, employing workplace—that is, providing a latex-free environment—should play a prominent

Table 1. Occupational health management programs for latex allergy workers in the healthcare setting.

Level	Management approach	Example
Institutional	Glove replacement policy ²	<ul style="list-style-type: none"> - Provide latex-free medical equipment and supplies⁵ - Latex sensitization/allergy workers^{2,14} <ul style="list-style-type: none"> ○ Replace powdered latex gloves with synthetic rubber gloves - Non-latex sensitization/allergy workers^{2,14} <ul style="list-style-type: none"> ○ Replace powdered latex gloves with non-powdered or non-powdered low protein latex gloves
Individual	Latex allergy surveillance and reporting system ^{5,14}	<ul style="list-style-type: none"> - Establish latex allergy screening program¹⁴ - Implement latex allergy reporting and evaluating system^{5,14}
	Educational program ^{2,5,8}	<ul style="list-style-type: none"> - Provide health education program about latex allergy and its risk factors^{2,5,8}
	Emergency management plan for severe allergic individuals ⁸	<ul style="list-style-type: none"> - Provide epinephrine self-injection⁸ - Provide identification bracelet or necklace⁸

role in reducing the prevalence of latex allergy. For example, the respective administrative or occupational health and safety committee can procure alternative latex-free medical equipment and supplies.^{2,5} Furthermore, reducing the concentration of latex allergen by banning powdered latex gloves and procuring replacement gloves represents an effective workplace strategy in developed countries.^{4,5,14} In nations with financial constraints, like Thailand, the total replacement approach with synthetic rubber gloves is thought to be too costly, so providing those gloves for only latex allergy workers and replacing powdered latex with non-powdered latex gloves for coworkers are much more feasible.^{2,14,15}

In parallel with the institutional approach, preventive measures for latex allergy workers should be recommended and performed (e.g. promoting regular use of non-latex gloves and wearing individual latex allergy alerts). The current report found that replacing latex gloves with non-latex gloves is essential for improving latex allergic symptoms and decreasing further suffering. In addition, a latex allergy labeling bracelet or necklace is vital for latex allergy individuals, especially those who have a history of latex anaphylaxis.^{2,5}

Conclusion

This case report underscored that the patient had suffered from anaphylaxis—initially caused by latex allergy—following latex allergens exposure during surgical-medical procedures. Therefore, delayed recognition without appropriate management leads to severe consequences. In this case, institutional and individual occupational health management are demonstrated solutions for latex allergy management in the workplace.

Acknowledgements

The authors thank Bryan Roderick Hamman for assistance with the English-language presentation of the manuscript.

Author contributions

C.N. and N.C. contributed to the conceptual and design. C.N. contributed to the acquisition of data, interpretation, literature review, and manuscript drafting. N.C. contributed to the supervision and critical review.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval to report this case was obtained from Khon Kaen University Ethics Committee for Human Research (IRB00001189) based on the Declaration of Helsinki and the ICH Good Clinical Practice Guidelines with approval number: HE641348.

Informed consent

Written informed consent dated on 21 July 2021 was obtained from the patient for her anonymized information to be published in this article. The evidence is available if requested.

ORCID iD

Naesinee Chaiear  <https://orcid.org/0000-0001-9295-6760>

References

1. Wu M, McIntosh J and Liu J. Current prevalence rate of latex allergy: why it remains a problem? *J Occup Health* 2016; 58(2): 138–144.
2. NHS Plus, Faculty of Occupational Medicine, Royal College of Physicians. Latex allergy: occupational aspects of management: a national guideline, 2008, https://www.nhshealthatwork.co.uk/images/library/files/Clinical%20excellence/Latex_allergy_full_guidelines.pdf

3. Liss GM, Sussman GL, Deal K, et al. Latex allergy: epidemiological study of 1351 hospital workers. *Occup Environ Med* 1997; 54(5): 335–342.
4. Blaabjerg MS, Andersen KE, Bindslev-Jensen C, et al. Decrease in the rate of sensitization and clinical allergy to natural rubber latex. *Contact Dermatitis* 2015; 73(1): 21–28.
5. Parisi CAS, Kelly KJ, Ansotegui IJ, et al. Update on latex allergy: new insights into an old problem. *World Allergy Organ J* 2021; 14(8): 100569.
6. Boonchai W, Sirikudta W, Iamtharachai P, et al. Latex glove-related symptoms among health care workers: a self-report questionnaire-based survey. *Dermatitis* 2014; 25(3): 135–139.
7. Boonchai W, Sirikudta W and Kasemsarn P. Characteristics of latex glove usage and glove-related symptoms among health care workers in each work sector of a university hospital. *J Med Assoc Thai* 2017; 100(5): 559–564.
8. Quirce S and Fiandor A. How should occupational anaphylaxis be investigated and managed? *Curr Opin Allergy Clin Immunol* 2016; 16(2): 86–92.
9. Moscato G, Pala G, Crivellaro M, et al. Anaphylaxis as occupational risk. *Curr Opin Allergy Clin Immunol* 2014; 14(4): 328–333.
10. Siracusa A, Folletti I, Gerth van Wijk R, et al. Occupational anaphylaxis—an EAACI task force consensus statement. *Allergy* 2015; 70(2): 141–152.
11. Janeway CA Jr, Travers P, Walport M, et al. *Immunobiology: the immune system in health and disease*. 5th ed. New York: Garland Science, 2001.
12. Wongrakpanich S, Klaewsongkram J, Chantaphakul H, et al. Jackfruit anaphylaxis in a latex allergic patient. *Asian Pac J Allergy Immunol* 2015; 33(1): 65–68.
13. Blanco C. Latex-fruit syndrome. *Curr Allergy Asthma Rep* 2003; 3(1): 47–53.
14. Caballero ML and Quirce S. Identification and practical management of latex allergy in occupational settings. *Expert Rev Clin Immunol* 2015; 11(9): 977–992.
15. Madan I, Cullinan P and Ahmed SM. Occupational management of type I latex allergy. *Occup Med* 2013; 63(6): 395–404.