

# A Case Report of Anaphylaxis in Health Care Personnel: The Importance of History-Taking and Occupational Health Management

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The authors described a 43-year-old male Thai practical nurse (PN) who developed anaphylaxis several times between 2013 and 2019, possibly caused by jackfruit (*Artocarpus heterophyllus*) and eggplant (*Solanum melongena*) ingestion. The occupational medicine physician suspected that the anaphylaxis might be due to a cross reaction of these plants to latex protein in medical gloves as this PN had a history of contact urticaria while using disposable latex gloves in December 2014. The symptoms disappeared after he used sterile latex powdered gloves with reusable. According to the history and the result of specific IgE against latex of 28.1 KUA/L and jackfruit of 1.61 KUA/L, although no skin prick test was performed, he was then diagnosed with latex-fruit syndrome. The use of nitrile gloves and latex products avoidance were advised. At the 1-year follow-up, he had no recurrent allergic symptoms or anaphylaxis.

**Keywords:** Anaphylaxis; Eggplant; Jackfruit; Latex allergy; Latex-fruit syndrome

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Anaphylaxis remains a current problem in medical practice. The global incidence is between 50 and 112 episodes per 100,000 person-years. Similarly, the lifetime prevalence of anaphylaxis ranges from 0.3% to 5.1%<sup>(1)</sup>. Hospital admissions due to anaphylaxis have increased by 100% in the last ten years. By contrast, the mortality rate has decreased from 0.12 to 0.16 deaths per million person-years<sup>(2)</sup>. Food, medication, and insect venom (Hymenoptera) are the most common allergens that cause anaphylaxis<sup>(1,3)</sup>. Food is the most common cause of fatal anaphylaxis in people under the age of 35, while medication and Hymenoptera sting are the most common causes for people in their fifth decade. Around 30% of patients with a history of the first episode of anaphylaxis may have recurrent anaphylaxis at least once in the rest of their life<sup>(2)</sup>.

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Fifty-seven percent of anaphylactic patients with emergency department visits in the United States had an unknown cause<sup>(4)</sup>.

It is common to find a relationship between allergens and occupation (occupation allergen). Hymenoptera stings, for example, are common among beekeepers, gardeners, and farmers, whereas latex allergies are common among healthcare workers, hairdressers, and workers in latex factories<sup>(5)</sup>. Anaphylaxis can occur during work hours and off work. However, cross-reaction between non-occupational allergens may be the conclusion when the allergic trigger can be identified through history-taking and medical investigations<sup>(6)</sup>. The incidence of idiopathic anaphylaxis decreased from 59% (between 1978 and 2003) to 35% (between 2006 and 2016) as the identification of more triggers has improved<sup>(7)</sup>. Notwithstanding, a history of latex allergy in healthcare personnel patients is often overlooked, as their latex allergy symptoms can be minor, leading to misdiagnosis. Herein, the authors reported a practical nurse (PN) diagnosed with latex-fruit syndrome with a history of contact urticaria due to latex allergy and anaphylaxis due to jackfruit (Figure 1) and eggplant (Figure 2) ingestion.

## Case Report

On August 18, 2021, an occupational medicine



**Figure 1.** Jackfruit.



**Figure 2.** Eggplant.

physician (OMP) was consulted to evaluate a 43-year-old Thai male PN who worked in an emergency department at a university hospital in Thailand who denied COVID-19 vaccination because he had several anaphylaxes due to particular vegetables and fruits intake. The OMP took detailed history taking and medical record review, the PN had no atopic symptoms or history of allergic diseases in his family. He had essential hypertension, dyslipidemia, and chronic viral hepatitis B, and denied allergy to current medication. On February 14, 2014, he was brought

to the emergency department due to anaphylaxis after jackfruit ingestion. Around December 2014, he had pruritic, wheals, and flares on both hands within five minutes whenever he used disposable latex gloves. After he changed to using examination gloves and reusable powdered sterile latex gloves, no rash occurred. However, he still continued to have emergency department visits from anaphylaxis between 2015 and 2019. After the university hospital changed their gloves from sterile latex powdered gloves to sterile latex powder-free examination gloves in 2020, the rash and symptoms of anaphylactic reaction disappeared.

Physical examination did not show any skin lesion on his hands. The specific IgE using ImmunoCAP against latex was 28.1 KUA/L as class IV or high, and the specific IgE against jackfruit was 1.61 kUA/L as class II or low. The patient was diagnosed with the latex-fruit syndrome, and his medical record was reviewed (Table 1).

## Discussion

Two previous case reports revealed that healthcare workers experienced recurrent anaphylaxis for no apparent reason. The first case, latex allergy was ruled out, and it was determined that the patient had a piperacillin allergy when preparing the antibiotic<sup>(8)</sup>. The second case was initially diagnosed with chronic spontaneous urticaria. After that, she developed several anaphylaxes and found that she had latex allergy<sup>(9)</sup>. Although the patient presented with recurrent anaphylaxis and latex allergy in the present case report, the diagnostic process should be elaborated.

Latex allergy has been more frequently found

**Table 1.** History of emergency department visits

Date	Diagnosis	Allergen	Glove use	Symptoms related to gloves use
April 23-24, 2013	Anaphylaxis	Unknown	Disposable latex	No symptoms
February 14, 2014	Anaphylaxis	Jackfruit ( <i>Artocarpus heterophyllus</i> )	Disposable latex	No symptoms
May 13-14, 2014	Anaphylaxis	Unknown	Disposable latex	No symptoms
December 20, 2014	Anaphylaxis	Suspected <i>Alstonia scholaris</i> inhalation	Disposable latex	Changed to resterilized-powdered latex due to contact urticaria (found date August 20, 2021)
December 21-22, 2015	Anaphylaxis	Eggplant ( <i>Solanum melongena</i> )	Resterilized-powdered latex	No rash on both hands
January 21, 2016	Anaphylaxis	Unknown	Resterilized-powdered latex	No rash on both hands
October 22-23, 2017	Acute urticaria	Unknown	Resterilized-powdered latex	No rash on both hands
June 10-11, 2019	Anaphylaxis	Jackfruit	Resterilized-powdered latex	No rash on both hands

between 1980 and 1990 because of the widespread use of latex gloves, which prevent blood-borne transmission of diseases such as hepatitis B, hepatitis C, and HIV. A study in Thailand reported that the prevalence of latex allergy in rubber-tapping gardeners and workers in latex factories was 1.3% and 1.7%, respectively. In comparison, the prevalence of such an allergy in healthcare personnel is 3.13%<sup>(10)</sup>. However, latex gloves are still mainly used in Thailand<sup>(11)</sup>.

Latex fruit syndrome is a serious condition because an anaphylaxis reaction can lead to death. Common fruits related to latex fruit syndrome include bananas, avocados, chestnuts, and kiwi. Another Thai study reported that bananas, jackfruit, and Phuk-waan-ban were fruits related to latex allergy<sup>(12-14)</sup>.

The present patient was diagnosed with latex fruit syndrome because his clinical history of anaphylaxis correlated with jackfruit and eggplant ingestion, whereas the history of latex allergy was misdiagnosed during previous emergency department visits. After the patient had a visit to the occupational medicine clinic, the occupational physician found that he had a history of contact urticaria whenever he used disposable latex gloves (circa December 2014). The specific IgE test against latex was 28.1 KUA/L for class IV or high, per his history of latex allergy. The specific IgE against jackfruit in the present patient was 1.61 kUA/L for class II or low, which was higher than the cutoff of 0.35 KUA/L and confirms allergic sensitization<sup>(15)</sup>. Specific IgE against eggplant and *Alstonia scholaris* was unavailable at the authors' institution. However, a skin prick test for jackfruit, eggplant, and *Alstonia scholaris* was not done to avoid an anaphylactic reaction<sup>(16)</sup>. Additionally, there are few cases of eggplant anaphylaxis correlated with latex allergy. The first was reported in 2004<sup>(17)</sup>. Although *Alstonia scholaris*

is a confirmed aeroallergen, no previous studies report an anaphylaxis reaction due to exposure to *Alstonia scholaris* in humans<sup>(18)</sup>.

The present patient changed the reesterilized-powdered latex examination gloves with reusable gloves. While his contact urticaria disappeared due to lower levels of extractable antigenic protein found in sterile gloves<sup>(19)</sup>, he continued to suffer from several anaphylaxes. This could be due to the powder in the examination gloves, as powdered sterile latex gloves can cause anaphylaxis via inhalation of latex particles<sup>(20)</sup>. The use of powder-free gloves has resulted in a decrease in the symptoms of latex exposure<sup>(21)</sup>. Moreover, the new techniques for allergy-free natural rubber gloves might also have no latex allergy symptoms in this patient<sup>(22)</sup>. However, after the patient visited the Occupational Medicine clinic on August 20, 2021, the patient was advised to wear nitrile gloves and avoid other latex products. At the one-year follow-up, he had no further history of anaphylaxis or allergic symptoms and confirmed having avoided exposure to latex, jackfruit, and eggplant.

## Conclusion

The authors reported jackfruit and eggplant as the less common fruits that can cause latex fruit syndrome. Therefore, the authors concluded that anaphylaxis due to non-occupational or unknown allergens in healthcare personnel, history-taking, and investigation of allergies due to common occupational allergens and correlation with other allergens should be considered.

## What is already known on this topic?

Natural rubber latex is still widely used in Southeast Asia countries. Latex fruit syndrome is a serious condition because an anaphylaxis reaction

can lead to death. Common fruits related to latex fruit syndrome include bananas, avocados, chestnuts, and kiwi.

### What does this study add?

Jackfruit and eggplant can cause latex fruit syndrome. The job description should be assessed carefully when anaphylaxis occurs in health workers because anaphylaxis may not only be caused by exposure to natural rubber latex gloves but also exposure to some fruits or vegetables.

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### Ethical approval

The present case report was approved by the Ethics Committee of Khon Kaen University 163 (EC number: HE651466).

### Data availability

Information of the present patient is located in electronic medical record at Srinagarind Hospital, Khon Kaen University, Thailand.

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### Conflicts of interest

The authors declare no conflict of interest.

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