Journal of Community Hospital Internal Medicine Perspectives

Volume 13 | Issue 4 Article 9

2023

Jackfruit Anaphylaxis Due to Cross Reactivity with Latex

Shraboni Dey
Hackensack Meridian Health - Palisades Medical Center, North Bergen, NJ, drshrabonidey@gmail.com

Young Hu
Hackensack Meridian Health - Palisades Medical Center, North Bergen, NJ, YOUNGHU26@GMAIL.COM

Jonathan Torres Gonzalez
Hackensack Meridian Health - Palisades Medical Center, North Bergen, NJ,
jonathan.torresgonzalez@hmhn.org

Adam Atoot
Hackensack Meridian Health - Palisades Medical Center, North Bergen, NJ,
ADAMATOOT.MD@GMAIL.COM

Ayrton Bangolo
Hackensack Meridian Health - Palisades Medical Center, North Bergen, NJ, ayrton.bangolo@hmhn.org

Recommended Citation

Dey, Shraboni; Hu, Young; Torres Gonzalez, Jonathan; Atoot, Adam; and Bangolo, Ayrton (2023) "Jackfruit Anaphylaxis Due to Cross Reactivity with Latex," *Journal of Community Hospital Internal Medicine Perspectives*: Vol. 13: Iss. 4, Article 9.
DOI: 10.55729/2000-9666.1199
Available at: https://scholarlycommons.gbmc.org/jchimp/vol13/iss4/9

CASE REPORT

Jackfruit Anaphylaxis Due to Cross Reactivity with Latex

Shraboni Dey*, Young Hu, Jonathan Torres, Adam Atoot, Ayrton Bangolo

Hackensack Meridian Health - Palisades Medical Center, North Bergen, NJ, USA

Abstract

Growing evidence has demonstrated that many common plant foods such as mangos, kiwis and jackfruit lead to cross reactivity with the latex antigen in latex allergic patients. Here, we discuss the case of a 68 year old female of Bangladeshi descent who developed shortness of breath in the setting of anaphylaxis following the ingestion of jackfruit (*Artocarpus heterophyllus*). The patient had a history of latex allergy described as mild rash along with seasonal allergies causing mild rhinorrhea, congestion and sneezing. Given the strong cultural significance of jackfruit consumption in Asian countries and growing popularity in the use of jackfruit as a superfood meat alternative in Western nations, along with growing Asian population, there is a need for extensive education on the cross reactivity between plant foods and latex to prevent deadly cross-reactivity induced anaphylaxis. With this case report, we hope to raise awareness of this rare, yet morbid association.

1. Introduction

North America and Europe had a Latex Allergy epidemic in the 1980–90s, largely due to the introduction of "universal precautions" by the United States Occupational Safety and Health Administration (OSHA).[1] The prevalence amongst the general population varies, largely due to reagents used to identify cases. It largely affects 1 to 2 percent of the general population, but it is more likely seen in healthcare workers due to latex exposure at the workplace.[2]

Artocarpus heterophyllus (jackfruit) is the national fruit of Bangladesh, native to India, and common in Asia, Africa and South America.[3] It is one of the largest edible fruits in the world and is rich in carbohydrates, proteins, vitamins and minerals. While many Eastern countries have used the jackfruit for centuries to produce curries in the boiled form or consume the flesh in a fully ripened stage directly, the recent emergence of interest in meatless superfoods within Western nations has increased the overall popularity of jackfruit dramatically.

Allergies to fresh fruits and vegetables such as avocado, banana, chestnut, kiwi, celery, and pear cause patients to have a higher likelihood of hypersensitivity to latex and visa-versa of those with latex allergies. This phenomenon is known as latex-fruit syndrome in which 30–50% of individuals with allergies to latex have an associated hypersensitivity to some plant-derived food, especially fruit.[4] Here we present a case of anaphylaxis in a patient with a mild latex allergy following minimal jackfruit ingestion. This case report demonstrates the importance of educating patients on this rare and potentially lethal association.

2. Case presentation

This is a 68 year old female with a past medical history of hyperlipidemia, hypothyroidism and seasonal allergies who presented with acute onset of shortness of breath, wheezing, tongue swelling, periorbital swelling and extensive itchiness 30 min after ingesting four pieces of jackfruit. Patient was able to take oral Benadryl then the family called emergency medical services (EMS) for further evaluation. Upon EMS arrival, the patient received intramuscular epinephrine and was brought to the emergency department (ED).

Upon ED arrival she was found to be hemodynamically stable. Physical examination at that time

Received 9 February 2023; revised 14 April 2023; accepted 6 April 2023.
Available online 29 June 2023

* Corresponding author.
E-mail addresses: Drshrabonidey@gmail.com, shraboni.dey@hmhn.org (S. Dey).

https://doi.org/10.55729/2000-9666.1199

revealed tongue swelling, periorbital edema and tachycardia, but no other acute findings. Laboratory findings were unremarkable as seen in Table 1 and chest X-ray was grossly negative as seen in Fig. 1. Patient was diagnosed with an allergic reaction and was treated with Benadryl, Pepcid, Solu-Medrol and 1 L normal saline bolus, then admitted to the hospital observation service for further evaluation. Of note, during the interview, the patient reported seeing an allergist several years ago but does not remember all of the findings in the allergy panel. However, she does endorse having a confirmed allergy to latex which resulted in a mild rash in the past.

On initial swallow evaluation, the patient was unable to swallow properly. However, during the subsequent trial a few hours later, the patient was able to tolerate swallow evaluation and was placed on a dysphagia diet consisting of mechanically ground solids and thin liquids. Patient was only admitted for one night, but received Solu-Medrol, DuoNebs and Cetirizine with no reemergence of symptoms. She agreed with the plan for discharge with a tapered dose of steroid, cetirizine and epinephrine pen with follow up at primary care office and referral to allergy specialist within the week.

3. Discussion

Thus far, to the best of our knowledge, there have only been two prior cases reported in the literature on jackfruit-induced anaphylaxis in patients with a known latex allergy. Wongrakpanich et al. first reported a case of jackfruit anaphylaxis in a 34 year old Thai female nurse with a history of latex allergy for a year.[5] She was subsequently treated and underwent skin prick testing (SPT). The testing showed allergies to jackfruit, papaya, kiwi and two different brands of latex gloves. Brief history indicated that the patient was able to have jackfruit as a child, but subsequent exposure to latex gloves as a nurse created a latex allergy and ultimately a cross reaction between latex and jackfruit.

Jalil et al. was the first report of jackfruit anaphylaxis in a patient in a non-endemic region.

Table 1. Admission laboratory findings.

White Blood Cells	9.4 10*3/uL
Hemoglobin	11.6 g/dL
Platelets	275 10*3/uL
BUN	10 mg/dL
Creatinine	0.65 mg/dL
Alkaline Phosphatase	43 g/dL
Bilirubin Total	0.5 mg/dL
Aspartate transaminase (AST)	16 U/L
Alanine transaminase (ALT)	15 U/L

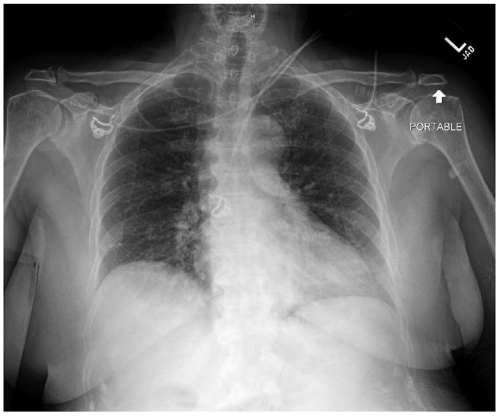

Fig. 1. Admission CXR

They reported a case of jackfruit anaphylaxis in a 21 year old Caucasian male who did not work in the healthcare industry.[6] However, he did have a known history of latex allergy at a young age after he developed hives while playing with balloons. He was treated with diphenhydramine by EMS and given methylprednisolone and famotidine with good resolution of symptoms. Patient was observed in the ED for three hours and discharged with prednisone. All symptoms resolved within 24 h. Subsequent SPT showed sensitivities to latex and jackfruit, while previous allergy testing also showed allergies to dust mites and mixed grasses. There is also a third case report by Kabir et al. in which a 57 year old Jamaican female healthcare aid had an anaphylactic reaction to fresh jackfruit, with no known latex allergy and subsequent negative SPT to latex.[7] But this case carries significance as there have been sparse reports of jackfruit anaphylaxis in the literature.

Jackfruit (*A. heterophyllus*) are tropical composite fruit grown natively in India and other South-Eastern Asian countries such as Bangladesh, Myanmar and has also been grown in South American countries such as Brazil. Jackfruit are an excellent source of macronutrients and micronutrients[8] and have increasingly been used as a meat alternative for vegan or vegetarian individuals in Westernized countries.[9] Our case continues to add to the growing evidence that jackfruit anaphylaxis is caused by cross-reactivity with latex, even in individuals that do not have regular exposure to latex in the healthcare field.

With the increase in latex glove use within the healthcare industry secondary to universal precautions set by OSHA, there was an observed specific and significant increase in fruit hypersensitivity in patients with latex allergies.[1,10] Experts say approximately 30–50% of these individuals with

latex allergies also have a sensitivity to fruit.[4] While most common fruits involved in this phenomenon are avocados, bananas, chestnuts, kiwis, peaches, tomatoes, potatoes and bell peppers, any plant derived fruit can spur a reaction.[10] The most accepted hypothesis since this occurrence was observed is allergen cross-reactivity due to IgE antibodies that recognize similarly structured epitopes.[4] Thus far, fifteen rubber latex allergen proteins have been identified by the International Immunological Societies ranging from nomenclature of Hev b1 to Hev b15.[11,12] Each protein is linked to cross-reactivity in various foods (for example Hev b7 shows cross-reactivity with its analogous protein in potatoes), but the most common cross-reactions have been noted in Hev b2, Hev b7, Hev b8, Hev b11 and Hev b12. As Jalil et al. alluded to in their case, there has still been no lab analysis performed elucidating the cross reaction between jackfruit and latex.

4. Conclusion

The incidence of jackfruit consumption will only continue to rise in the Eastern and Western countries. While the incidence of jackfruit anaphylaxis is quite low, latex allergies are quite prevalent, especially amongst the healthcare worker population. Not all individuals have latex fruit syndrome, but it may still be prudent to educate susceptible individuals about the risks of cross reactivity and anaphylaxis, even considering SPT for common cross reactive fruits while we await formal lab analysis between jackfruit and latex proteins.

Conflict of interest

The authors have no potential conflicts of interest to disclose.

References

1. Broussard IM, Kahwaji CI. Universal precautions [Updated 2022 Sep 1]. [Internet]. In: *StatPearls*. Treasure Island (FL) StatPearls Publishing; 2022 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470223/.
2. Bousquet J, Flahault A, Vandenplas O, et al. Natural rubber latex allergy among health care workers: a systematic review of the evidence. *J Allergy Clin Immunol*. 2006 Aug;118(2):447–454. https://doi.org/10.1016/j.jaci.2006.03.048. Epub 2006 Jul 3. PMID: 16890771.
3. Ranasinghe RASN, Maduwanthi SDT, Marapana RAUJ. Nutritional and health benefits of jackfruit (Artocarpus heterophyllus Lam.): a review. *Int J Food Sci*. 2019 Jan 6, 4327183. https://doi.org/10.1155/2019/4327183, 2019 PMID: 30723733; PMCID: PMC6339770.
4. Wagner S, Breiteneder H. The latex-fruit syndrome. *Biochem Soc Trans*. 2002 Nov;30(Pt 6):935–940. https://doi.org/10.1042/bst0300935. PMID: 12440950.
5. Wongrakpanich S, Klaewsongkram J, Chantaphakul H, Ruxrungtham K. Jackfruit anaphylaxis in a latex allergic patient. *Asian Pac J Allergy Immunol*. 2015 Mar;33(1):65–68. https://doi.org/10.12932/AP0416.33.1.2015. PMID: 25840636.
6. Jalil M, Hostoffer R, Wu SS. Jackfruit anaphylaxis in a latex allergic non-healthcare worker. *Allergy Rhinol*. 2021 May 26;12, 21526567211009195. https://doi.org/10.1177/21526567211009195. PMID: 34104534; PMCID: PMC8165822.
7. Kabir S, Fatteh S. Jackfruit induced anaphylaxis associated BIRCHPOLLEN-related food allergies. *Ann Allergy Asthma Immunol*. 2018;121(5):S120. https://doi.org/10.1016/j.anai.2018.09.398.
8. Sowmyashree G, Sharath kumar MN, Devaraja S. Jackfruit and its beneficial effects in boosting digestion and immune-enhancing properties. Nutrition and functional foods in boosting digestion. *Metabol Imm Health*. 2022:267–287. https://doi.org/10.1016/b978-0-12-821232-5.00014-8.
9. Hamid MA, Tsia FLC, Okit AAB, et al. The application of Jackfruit by-product on the development of healthy meat analogue. *IOP Conf Ser Earth Environ Sci*. 2020;575(1), 012001. https://doi.org/10.1088/1755-1315/575/1/012001.
10. Blanco C. Latex-fruit syndrome. *Curr Allergy Asthma Rep*. 2003 Jan;3(1):47–53. https://doi.org/10.1007/s11882-003-0012-y.
11. Burks AW, Holgate ST, O'Hehir RE, et al. *Middleton's allergy: principles and practice*. Amsterdam, the Netherlands: Elsevier Health Sciences; 2020.
12. Larsen JN, Lowenstein H. Allergen nomenclature. *J Allergy Clin Immunol*. 1996;97(2):577–578.