

Four cases of delayed onset systemic reaction to shellfish

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Clinical Implications

- Here we present a case series of delayed onset systemic allergic reactions to shellfish. Clinicians should be aware of this entity when evaluating patients for shellfish allergy and performing oral food challenges.

TO THE EDITOR:

Shellfish allergy is one of the most common causes of food-induced anaphylaxis with reported allergy in the United States of 0.5% to 2.5%.^{1,2} Previously described allergic reactions to shellfish include urticaria, oral allergy syndrome, anaphylaxis, food protein-induced enterocolitis syndrome, food-dependent exercise-induced anaphylaxis, and contact dermatitis.²⁻⁵ To our knowledge, there have been no reports of delayed-onset systemic reactions to shellfish in the medical literature. Here, we describe 4 cases of delayed-onset systemic allergic reaction to shellfish.

A 5-year-old girl was evaluated in our Outpatient Allergy Clinic for delayed angioedema to shrimp. The patient had 7 prior episodes of angioedema 2 to 6 hours after eating shrimp. Episodes were responsive to diphenhydramine and steroids. She had no history of urticaria or angioedema unrelated to shrimp ingestion or of tolerating shrimp without reaction. Skin prick testing was negative to shrimp. Serum specific IgE was negative to shrimp, other crustaceans, mollusks, and fish, as well as Pen a 1 tropomyosin, the major shrimp allergen. The patient underwent a 6-dose oral food challenge and consumed more than 30 g of shrimp. She remained asymptomatic 1 hour after the challenge. She consumed no other food or medications for the rest of the day, did not engage in vigorous physical activity, and had no concurrent illness. Six hours after the challenge, she developed wheezing and angioedema of the face. Her mother administered epinephrine and took her to the emergency department, where she was given steroids. The following morning, she was evaluated in our Outpatient Allergy Clinic and had resolving angioedema of the face and no further wheezing.

A 7-year-old boy with allergic rhinitis and asthma was evaluated in our Outpatient Allergy Clinic for food sensitizations. His parents reported elevated serum specific IgE to shrimp and crab identified at another practice 1 year earlier, although it remains unknown why this testing was performed. He had previously tolerated shrimp and crab without reaction, but avoided these foods since these results. He underwent skin-prick testing in our office that revealed dust mite 5 mm wheal, 25 mm flare; cockroach 10 mm wheal, 15 mm flare; shrimp 3 mm wheal, 5 mm flare; and crab 9 mm wheal, 30 mm flare. Decision was made to proceed with oral food challenge to shrimp. He underwent a 5-dose oral food challenge and consumed 25 g of shrimp. He remained asymptomatic 1 hour after the challenge

and was discharged home. Two hours later, he developed diffuse urticaria and was taken to a local emergency department, where he was diagnosed with anaphylaxis and given epinephrine, antihistamines, and steroids with resolution of symptoms. He had consumed no other foods or medications, had no concurrent illness, and did not engage in exercise in the interim between the oral food challenge and onset of symptoms.

A 5-year-old boy with allergic rhinitis was evaluated in our Outpatient Allergy Clinic for 2 episodes of delayed urticaria after eating shellfish. The first episode occurred the morning after ingesting a restaurant-made lobster soup the previous evening and was characterized by severe facial angioedema and diffuse urticaria. The second episode occurred the morning after ingesting crab the previous evening and consisted of diffuse urticaria. He did not engage in vigorous physical activity, had no medications, and no concurrent illness. Skin-prick testing revealed dust mite 26 mm wheal, 45 mm flare, crab 5 mm wheal, 20 mm flare, and shrimp 0 mm wheal, 0 mm flare. He was advised to avoid crab and lobster, was cautioned against consumption of other crustaceans, and was prescribed an epinephrine autoinjector.

A 59-year-old man with diabetes insipidus was evaluated by our Inpatient Allergy Consult Service for anaphylaxis. The night prior he had had a meal of mammalian meats, poultry, fish, shellfish, dairy products, bread, fruits, vegetables, chocolate, mixed nuts, and champagne. He had no concurrent illness and did not engage in any vigorous physical activity or consume aspirin or nonsteroidal anti-inflammatory drugs. He had a history of angioedema with mango and chest tightness with dried fruits. Four hours after his meal, he awoke with urticaria, angioedema, and lightheadedness. On the arrival of emergency medical services (EMS), he had a systolic blood pressure of 60 mm Hg and was wheezing. He was given albuterol and intramuscular diphenhydramine. On arrival to the hospital, he was given desmopressin (DDAVP), given his history of diabetes insipidus. His blood pressure normalized, and his urticaria, angioedema, and wheezing slowly improved. He was found to have the following serum specific IgE: shrimp 4.69 kU/L, crab 3.74 kU/L, mussels 0.55 kU/L, lobster 2.57 kU/L. Fish allergy screen was notable for tuna IgE 0.48 kU/L. Beef, pork, and lamb IgE were negative. Galactose-alpha-1,3-galactose IgE was negative. He eliminated shellfish from his diet and continued to consume alcohol and eat the other foods to which he had positive serum specific IgE without further reaction. Four weeks after his initial reaction he underwent skin-prick testing that revealed crab 12 mm wheal, 14 mm flare; lobster 8 mm wheal, 15 mm flare; shellfish mix 9 mm wheal, 20 mm flare; shrimp 4 mm wheal, 5 mm flare. He was advised to avoid shellfish and was prescribed an epinephrine autoinjector.

Delayed anaphylaxis to food has previously been recognized with alpha-gal food allergy, but otherwise is not well documented in the medical literature.^{6,7} The cases presented here illustrate that delayed systemic allergic reactions may also occur with shellfish. We cannot exclude the possibility of delayed-phase anaphylaxis without an identified immediate phase, although this is unlikely in the setting of an in-office monitored oral food challenge.⁸ In our Outpatient Allergy Clinic, which performs more than 300 oral food challenges per year, we have seen no

other foods cause a delayed systemic reaction, suggesting a pattern with shellfish. Cross-reactivity with dust mite or cockroach tropomyosin in shellfish-allergic patients is well documented, and may also play a role in cases, particularly where there is no evidence of shellfish sensitization or the reaction appears dependent on dose or mode of preparation.⁹ Research is needed to determine the mechanism of delayed anaphylaxis and systemic reactions to shellfish and clinicians should keep this possibility in mind when evaluating food allergy and challenging patients to shellfish.

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