



HYPERSENSITIVITY TO SEAFOOD AND FISH

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Dr Do-a-Lot's student presents his notes on seafood and fish allergy

Epidemiology

Seafood allergy occurs in about one per cent of the population and is more common in adults than in children. It tends to be a lifelong problem in most patients. It is more common in areas where there is a high consumption of fish and seafood such as Scandinavia and Australasia. Seafood allergy is an important cause of anaphylaxis.

Signs and symptoms

Signs and symptoms usually occur within minutes of contact or ingestion. They may occur in the gastrointestinal tract with nausea, abdominal cramps, bloating and diarrhoea, in the skin with flushing, urticaria and angioedema, and in the respiratory system with wheezing, cough and rhinitis. Symptoms may be mild and confined to one body system, but in severe reactions anaphylaxis may occur with multisystem involvement and cardiovascular collapse.

The allergenic proteins

We can loosely divide seafood into three main groups: fish, crustaceans and molluscs.

Fish include tuna, mackerel, salmon, yellowtail, sardines, cod, herring, anchovies, trout, haddock, eels and rays.

Crustaceans include prawns, shrimps, lobster, crayfish and crab.

Molluscs include mussels, oysters, clams, octopus and squid.

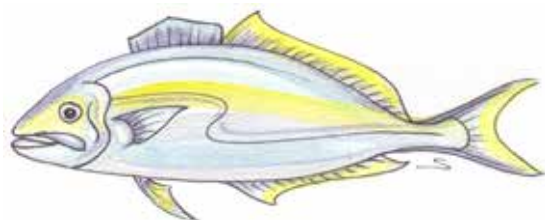
The distinction is important because the groups have distinct allergenic proteins. This means that if a patient is allergic to tuna fish, they may be able to tolerate mussels or crayfish. Within the same group the allergens are similar, so patients who are allergic to crayfish are likely to be allergic to shrimp and should avoid all crustaceans.



A seafood platter containing examples of molluscs and crustaceans

Cross-reactivity between groups may occur, but often individuals are allergic to more than one seafood group. Seafood allergenic proteins tend to be heat stable. Cooking does not typically improve tolerance. Some individuals may tolerate tinned fish but this is unpredictable. Steamed

or braaied fish may release vapours that contain minute allergenic amine particles that can cause symptoms in highly sensitive individuals. Even handling fish can cause symptoms in some sensitised individuals. This can be an occupational hazard for food handlers and chefs.



Cape Yellowtail (Seriola lalandi)

Diagnosis

A careful history is important in order to distinguish true seafood allergy from food poisoning (toxicity), sensitivity to parasites, or a reaction to preservatives consumed as part of a seafood meal.

Skin-prick tests or serum-specific immunoglobulin E (IgE) tests are helpful in diagnosis.

In some cases a food challenge test under controlled conditions (with resuscitation facilities) is indicated.

Note: a positive test for an allergen means that an individual is sensitised to that specific protein. They may, however, not be 'allergic' to it. That is: they may not express their sensitivity through clinically discernible physical symptoms or signs. This can be a confounding factor when making a diagnosis.

Management

Avoidance of the offending allergen is the only available treatment for seafood allergy.

Restaurants that serve fish and seafood are best avoided as there is a high chance of contamination in the kitchen through the use of shared cutting boards and utensils.

Special attention must be paid to products that may contain fish such as oils, sauces, dips, supplements and dog food.

Accidental exposure may result in anaphylaxis so it is important that all individuals that are allergic to seafood

carry adrenaline auto-injectors. Empowering education regarding anaphylaxis recognition and treatment must be given, and patients should receive a written anaphylaxis action plan.

When patients are admitted with anaphylaxis, it is important that, on discharge, they receive: a new adrenaline auto-injector, a written anaphylaxis action plan, a referral to an allergy doctor, and an identification bracelet that states clearly: 'Seafood allergy: give adrenaline'.



Medical identification bracelet

Seafood and iodine

Seafood allergy is not related to iodine allergy, or to sensitivity to radio-contrast media.

Other causes of hypersensitivity reactions following the consumption of fish and seafood

Scromboid fish poisoning

Bacteria in the flesh of fish that has not been adequately refrigerated multiply and break down the fish protein, ultimately releasing histamine. Histamine is a powerful mediator of inflammation. When the histamine-rich fish is ingested, the patient experiences symptoms very similar to those experienced in an allergic reaction, with flushing, urticaria, nausea, palpitations, headache, vomiting and abdominal cramps. In severe cases dizziness and a drop in blood pressure may occur. This is not an IgE-mediated reaction, although it looks very much like one clinically. Game fish such as yellowtail and tuna that contain a high content of red meat that turns brown when cooked are often implicated. Affected fish has a metallic or peppery taste, and symptoms typically commence within 30 minutes of ingestion. Treatment is with antihistamines, although in severe cases that require admission to hospital for supportive care adrenaline may be administered. Testing for fish allergy will usually yield a negative result.

Anisakis simplex

This nematode is a parasitic worm that lives in the flesh of fish. It is found in most parts of the world. If fish is freshly cooked at a temperature of more than 60°C, or freshly frozen and properly cooked directly after defrosting, the parasite is destroyed. Infection occurs when fish is eaten raw, pickled or undercooked. Symptoms are typically gastrointestinal due to inflammation of the gut wall, with



An adrenaline auto-injector

nausea, vomiting and abdominal cramps. Sensitisation results in an IgE-mediated reaction. The history may be confusing as the patient will report intermittent reactions to fish ingestion, depending on the *Anisakis* content of the fish in question. The diagnosis can be made by testing serum for specific IgE to *Anisakis*.

Ciguatera poisoning

This condition is caused by eating fish that has been contaminated by toxins that are produced by algae present in the sea in the tropics. We see this condition on our African east coast, where the sea is warm and there is an abundance of large reef fish.

Paralytic shellfish poisoning and diarrhoetic shellfish poisoning

Toxins in algae that contaminate shellfish, in particular mussels and oysters, cause neurological symptoms when ingested.

The toxins in both the fish and shellfish in the above two conditions affect nerve endings causing tingling of the lips, tongue and throat. This may be followed by nausea, vomiting, headache, fever and muscle aches.

In severe cases cardiovascular symptoms, numbness, confusion and loss of consciousness have been described. Recovery is usually spontaneous within days or weeks with supportive treatment.

Preservatives and additives

Preservatives such as metabisulphites are sometimes used

to prevent discolouration of shellfish such as prawns and crayfish. They are also found in beverages such as beer and wine, and prepared sauces that may be served with seafood. Reactions to food additives may include wheezing, gastrointestinal upset and skin rashes. It is therefore important to consider additives in the food, or the sauce or beverage accompanying it, when taking a history in a patient describing a hypersensitivity reaction following eating a seafood meal.



Preservatives and additives must be considered when seeking a cause for a hypersensitivity reaction

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