Fish-oil capsule ingestion

A case of recurrent anaphylaxis

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This is the first reported case of recurrent anaphylaxis secondary to ingestion of an omega-3-6-9 fish-oil capsule. Our patient, who was known to be allergic to crab, developed anaphylaxis after ingesting her first omega-3-6-9 fish-oil capsule. Despite appropriate medical management, she had recurrent anaphylactic symptoms and required transfer from our rural hospital to a tertiary care centre.

This case report reviews the diagnosis and treatment of anaphylaxis and discusses the importance of considering the occurrence of a biphasic reaction.

Case

A previously healthy 45-year-old woman with known urticaria and lip angioedema to crab presented herself to a rural emergency department with her first onset of tongue, throat, and facial swelling, as well as shortness of breath. Thirty minutes before, she consumed her first omega-3-6-9 capsule and subsequently was unable to locate her epinephrine autoinjector. Her past medical history also included allergic rhinitis secondary to environmental allergens and asthma, which was well controlled using daily budesonide and salbutamol as needed.

On examination, she was agitated and nauseous; she appeared anxious and was clearly stridorous but did not have hives. Her respiratory rate was 28 breaths/min; pulse was 114 beats/min; and blood pressure was 165/139 mm Hg. Her oxygen saturation was 100% with a high-flow nasal cannula. She was diagnosed as having an anaphylactic reaction to fish oil and resuscitation measures were initiated.

She was given 1 mg of epinephrine and 50 mg of diphenhydramine intramuscularly while preparations for intubation were being made. She was also given 5 mg of salbutamol via nebulizer and, once intravenous access had been established, received 125 mg of methylprednisolone intravenously. Within minutes her condition had improved dramatically, as her agitation decreased and her stridor had ceased; hence intubation was considered unnecessary. Her blood pressure had decreased to 166/78 mm Hg, and the rest of her vital signs were stable. Once she felt comfortable swallowing, she was also given 300 mg of ranitidine. Given the severity of her reaction, she was admitted for overnight observation.

Within 2 hours of admission, she had a recurrence of stridor, which responded to a second 0.5-mg dose of epinephrine intramuscularly. She remained stable overnight only to have her stridor recur the following morning. She was started on 50 to 100 mg of hydroxyzine 4 times daily, in conjunction with 300 mg of ranitidine daily, 25 to 50 mg of diphenhydramine every 4 hours as needed, 10 mg of montelukast daily, 20 mg of cetirizine daily, and nebulized salbutamol and budesonide.

Despite the aforementioned treatment, she continued to have multiple daily recurrences of stridor over the next 2 days. We added 40 mg of prednisone daily to the above treatment regimen. While in hospital, the patient's food intake was monitored for prevention of cross-contamination with either crab or fish. We attempted to find information about the metabolism

EDITOR'S KEY POINTS

- Anaphylaxis is a life-threatening condition caused by an allergic reaction that requires immediate medical intervention.
- Up to 20% of anaphylactic reactions will follow a biphasic course.
- Studies have failed to identify a clear method for risk-stratifying individuals who are at risk for symptom recurrence.
- Because there is no known way to predict or prevent a biphasic reaction, monitoring and patient education is prudent.

POINTS DE REPÈRE DU RÉDACTEUR

- L'anaphylaxie est un problème causé par une réaction allergique qui met la vie en danger et qui exige une intervention médicale immédiate.
- Jusqu'à 20 % des réactions anaphylactiques ont une évolution biphasique.
- Les études n'ont pas permis de trouver une méthode claire de stratification des risques pour identifier les personnes à risque d'une récurrence des symptômes.
- Parce qu'il n'existe pas de façon connue de prévoir ou de prévenir une réaction biphasique, il est prudent de surveiller le patient et de le renseigner sur cette possibilité.

This article has been peer reviewed.
Cet article a fait l'objet d'une révision par des pairs.
Can Fam Physician 2012;58:e379-81

or half-life of the omega-3-6-9 fish-oil product in question but were unsuccessful.

Within a span of 8 hours on the fourth day, she had a total of 3 episodes of anaphylaxis manifesting not only as stridor but also with visible tongue swelling and a globus sensation. In an attempt to achieve better control of her mainly upper respiratory tract symptoms, 5 mg of nebulized epinephrine every 1 to 2 hours was started. After 3 doses, however, she refused further treatment owing to a burning sensation in her chest.

Given the increasing severity and recurring nature of her stridor with new-onset tongue and throat swelling, as well as the unknown half-life and metabolism of the ingested agent, she was transferred on her fourth day in hospital to the intensive care unit of an urban tertiary care centre. She spent 5 additional days in hospital undergoing similar management, where she stabilized and recovered fully. Additional inpatient investigations included C1 esterase assay, immunoglobulin E levels, and quantitative immunoglobulin levels, all of which had normal results. She was subsequently discharged with a referral to an allergist.

Discussion

Anaphylaxis was first described by Richet and Portier in 1902 while experimenting with venom immunization. Richet was subsequently awarded the 1913 Nobel Prize in Medicine or Physiology for his research.[1,2] Anaphylaxis is a life-threatening medical emergency characterized by the immediate release of widespread mast cell and basophil mediators into the systemic circulation and is the most severe immunoglobulin E–mediated allergic reaction.[1,3,4] Many known antigens such as food sources (eg, peanuts, tree nuts, shellfish, and fish), medications, and insect stings are known to cause anaphylaxis.[1,3,4]

Clinical presentation

In up to 92% of cases, the most common presenting symptoms of anaphylaxis are generalized urticaria and angioedema within 5 to 30 minutes of exposure to the offending agent.[1] Other signs and symptoms include upper airway obstruction (cough, globus, stridor), ocular irritation (lacrimation, conjunctivitis), respiratory distress (dyspnea, tachypnea, accessory muscle use, cyanosis), gastrointestinal irritation (nausea, vomiting, diarrhea, abdominal pain), and cardiovascular collapse (syncope, dizziness, weakness, seizures, hypotension, tachycardia).[1,3]

Approximately 20%[1-4] of anaphylactic episodes will follow a biphasic course. These episodes, although similar in characteristics to a primary anaphylactic episode,[2] vary broadly in their symptom presentation and severity (ranging from mild to fatal).[2] Most biphasic episodes will occur within the first 8 hours[1-4] of initial presentation. While attempts to define risk-stratification measures with respect to biphasic occurrences have been attempted, a combination of prospective and retrospective studies have failed to identify any reliable method for predicting who might be at risk of recurrence, how severe a recurrent episode might be, and how it might be prevented.[2]

Differential diagnosis

Because anaphylaxis is a potentially life-threatening condition, timely recognition, accurate diagnosis, and prompt treatment are of utmost importance. As cardiovascular collapse is a common feature of anaphylaxis, vasovagal reactions, seizures, myocardial infarction, and arrhythmias should all be considered[3]; however, these differential diagnoses will not exhibit the typical features of a histaminergic reaction. Furthermore, psychiatric conditions like panic disorder in conjunction with organic diseases such as severe asthma and pulmonary embolism should be considered in the case of acute respiratory decompensation.[3] Foreign body aspiration and epiglottitis might also be considered in the pediatric population.[3] Finally, flushing syndromes caused by hereditary angioedema, medications, and metabolic and neoplastic disorders might present with similar dermatologic manifestations.[3]

Management of anaphylaxis

The management of anaphylaxis rests upon the immediate initiation of intramuscular injections of epinephrine of a 1:1000 dilution (0.3 to 0.5 mL[1,3-5] to a reported maximum of 1 mL[5] in adults and 0.01 mL/kg[1,3,5] to a maximum of 0.3 mL[1,3] in children), with re-initiation every 5 to 15 minutes as needed.[1,3] In our case, 1 mL of epinephrine was used initially, but based on current evidence, a dose of 0.5 mL would have been equally appropriate with less potential for adverse events.[4,5] In the case of resistance to epinephrine (particularly in the presence of β-blockers), intravenous glucagon at a dose of 5 to 15 μg/min might need to be administered.[1,3]

While the use of nebulized epinephrine is well established in treating childhood croup, it has not been validated or studied for use in the setting of anaphylaxis. Our patient's symptoms, however, were predominantly upper respiratory in origin without evidence of cardiovascular collapse and we therefore attempted to prevent recurrence with the use of this therapy. In our case, therapy was stopped owing to adverse events, but the potential remains for further study.

Therapy with both H_1 and H_2 histamine blockers (eg, diphenhydramine, ranitidine) has traditionally been used and is still recommended in treating anaphylaxis.[1,3] However, systematic reviews have not found convincing evidence for or against the use of these classes of medications in the acute setting.[4,6] Systemic corticosteroids might also be considered in the case of moderate to severe episodes[1,3] with the caveat that systematic

reviews have not clearly demonstrated their efficacy[4,7] and that they have not been shown to prevent biphasic reactions.[2,3] Finally, inhaled β_2-agonists (in the event of bronchospasm) might also reduce the severity of symptoms from anaphylaxis.[1,3]

Owing to the severity of this condition and the relative inability to predict or prevent the occurrence of a biphasic reaction, many guidelines recommend that patients should be monitored for 4 to 8 hours[1-4] in a hospital setting after resolution of symptoms. It should be kept in mind that the potential for recurrence of symptoms extends beyond the aforementioned monitoring time frame,[2] and patients should therefore be cautioned to return if symptoms recur. Systemic steroids and antihistamine therapy can be continued for up to 5 days[3] after discharge, and patients should be prescribed an epinephrine autoinjector and be informed about the prevention of future exposure.[3,4] Finally, referral for allergen testing is also recommended in the long-term management of these patients.[1,3,4]

Conclusion

A patient previously known to have allergies to crab presented with recurrent anaphylaxis secondary to omega-3-6-9 fish-oil capsule ingestion, and after a summary of her course in hospital, a general review of the diagnosis and treatment of anaphylaxis was discussed.

Anaphylaxis is a clinical diagnosis based on key historical and physical examination features, and the traditional mainstay of therapy is prompt initiation of intramuscular epinephrine. While the short-term use of antihistamines and corticosteroids is commonplace and unlikely to cause harm, systematic reviews of these therapies fail to demonstrate a clear benefit.

Finally, it is important to recognize that up to 20% of anaphylactic episodes will follow a biphasic course and that in light of an inability to predict or prevent its occurrence, monitoring and patient education are key.

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Competing interests
None declared

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