

A Clinical Case of Scombrototoxicosis

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Abstract

Scombrototoxicosis or histamine poisoning is a common type of fish food poisoning, with an increasing prevalence due to changes in industry and food consumption. Histamine is a non-volatile amine that can be used in the action of bacterial decarboxylases present in fish. The signs and symptoms may occur within minutes to hours after fish consumption and may last for a few hours over several days. Typical symptoms include erythema and face and neck flushing, generalized discomfort, palpitations, and severe headache. It may also manifest as severe abdominal pain with diarrhea and, in more severe cases, respiratory distress and hypotension. The diagnosis is made by clinical history and confirmed by histamine levels. Total immunoglobulin E and fish specific immunoglobulin E levels are normal. Treatment depends on its severity, may not be necessary, may require the use of antihistamines or, in severe cases, may require admission to an intensive care for inotropic and/or ventilatory support. The authors report a clinical case of a 16-year-old adolescent who went to the emergency department with unspecific symptomatology, but whose clinical history allowed his diagnosis.

Keywords: Adolescent; Foodborne Diseases; Food Contamination; Histamine/toxicity; Seafood/adverse effects

Introduction

Scombrototoxicosis or histamine poisoning is considered one of the most prevalent forms of fish toxicity in the world. Histamine is a non-volatile amine resulting from the action of bacterial decarboxylases on its precursor, histidine, present in fish. The most commonly affected fish are those of the *Scombridae* family, such as tuna and mackerel.^{1,2}

Signs and symptoms occur within minutes to hours after fish ingestion and can last from a few hours up

to several days, depending on the concentration of histamine. The typical symptoms include erythema and flushing of the face and neck, along with generalized discomfort, palpitations, and severe headache. It can also present as severe abdominal pain with diarrhea and, in more severe cases, with respiratory distress and hypotension.^{3,4}

The diagnosis is made by clinical history and confirmed by histamine levels.^{2,5} Total immunoglobulin (Ig) E and fish specific IgE levels are normal. Treatment depends on its severity. It may not be needed, require only the use of antihistamines or, in severe cases, intensive care for inotropic and/or ventilatory support.²

Case Report

A 16-year-old male was admitted to the emergency department for severe headache, palpitations, pruritic rash in the trunk, back and upper limbs (Fig. 1), and generalized abdominal pain, which had a sudden onset after the ingestion of a tuna sandwich. He denied lip edema, cough, dyspnea, diarrhea, or other symptoms. There was no previous history of food or drug allergy, or other relevant history besides juvenile acne (treated with isotretinoin for two months). He used to have that same tuna fish sandwich weekly at the same establishment.

On observation, he was hemodynamically stable, with no signs of respiratory distress, and presented an erythematous towel rash in the trunk and upper limbs. Both cardiac and pulmonary auscultation and abdominal palpation were normal.

Laboratory testing found normal blood counts as well as transaminases and total IgE levels. Fish specific IgE (cod, shrimp, blue mussel, tuna and salmon) were tested. Serum tryptase levels were not available in the hospital laboratory. After antihistamine therapy (2 mg of intravenous clemastine) and surveillance in the emergency room, the adolescent was asymptomatic and discharged.

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Figure 1. Pruritic micropapular rash on the trunk and upper limbs. After a week, the adolescent was observed in the outpatient clinic with no further interurrences. His fish specific IgE results were negative. At this point, he has already eaten tuna again (against medical advice) but had no recurrence of the symptoms. Curiously, at this time, the adolescent knew someone who had also eaten a tuna sandwich the same day he first came to the hospital who had similar symptoms, although less severe, without the need of hospital care.

Discussion

Fish is considered a healthy food due to its nutritional characteristics. In order to be consumed without risk, it needs to be handled properly, from capture to consumption or industrialization. Despite the progressive improvement in this care, cases of food poisoning have been increasing, possibly due to the variable ways in which it is consumed, namely as a hamburger, pasta, pizza, salads, or even raw. In fact, histamine poisoning is, nowadays, one of the most prevalent forms of fish toxicity worldwide.⁴

It is well known that histamine poisoning is directly related to the improper preservation of fish. Inadequate cooling leads to bacteria proliferation which in turn leads to an increase in the histidine to histamine conversion rate with histamine levels that can reach toxic concentrations within 12 hours. In healthy fish, the levels of histamine are less than 0.1 mg/100 g. In these cases, these levels can be over 20-50 mg/100 g.^{1,6} As histamine is non-volatile, it renders the product

toxic before it is perceived as deteriorated or sensory unacceptable. However, some patients describe a sharp, metallic, bitter, or peppery taste as well as a honeycombed appearance of the fish.^{1,6}

As pure histamine is poorly absorbed in the gastrointestinal tract, and the liver and intestinal mucosa can deactivate histamines, it has been theorized that saurine, cadaverine, or putrescine (histamine hydrochloride) may enhance the activity of histamine, facilitating its absorption.⁷

Histamine intoxication may manifest from minutes to hours after ingesting the amine and its symptoms may last for a few hours or may extend for days, due to the uneven distribution of histamine in the fish tissues, differences in the amount consumed, and individual susceptibility to histamine.^{1,2} Some medications, such as isoniazid, may predispose people to more significant reactions because of a histaminase blockade in the gastrointestinal tract.² Clinical manifestations include erythematous and pruritic rash of the face, neck, and upper torso, severe and throbbing headache, dysphagia, nausea and vomiting, abdominal cramps and epigastric pain, diarrhea, palpitations, dry mouth, anxiety or unease, and in more severe cases loss of vision, angioedema, respiratory distress and chest tightness or hypotension.^{2,4}

This entity can easily be mistaken as a food allergy or acute gastroenteritis; however, the lack of a previous history of allergies and the possibility of occurring in more than one individual at the same time, constitute the main clinical clues, as in the case presented.¹ Total IgE and specific IgE levels are normal and the only analytical markers for this intoxication are increased histamine levels in plasma and high levels of histamine metabolites (N-methylhistidine) in urine, though not specific.^{2,5} Serum tryptase levels have been described as useful (if obtained within two hours after symptom onset) since it is elevated in an allergic reaction but usually in the normal range in cases of histamine food poisoning.⁸

Most cases do not require medical attention. Those who seek help should be given antihistamines for symptomatic relief, preferably H1 receptor antagonists, described as the most effective treatment.^{2,4} In the presence of severe symptoms, such as bronchospasm, angioedema, and hypotension, patients should be promptly treated with intravenous corticoids, nebulized adrenaline or amines, according to the clinical presentation. In rare cases, intensive care may be necessary. The administration of epinephrine, used when it is misdiagnosed as an acute allergic reaction, will also result in the rapid resolution of symptoms.³

Notification of histamine fish poisoning cases to the local health department is important, mainly if the source was public, in order to help prevent additional cases.

In conclusion, scombrototoxicosis or histamine poisoning is a common type of food poisoning, with increasing frequency because of the food industry and consumption. This condition can be easily misdiagnosed as other common diseases and an accurate clinical history is essential for its correct diagnosis. Even though most cases need only symptomatic relief, it is important to remember that some can present with severe manifestations and that there are important public health implications of this disease.

WHAT THIS CASE REPORT ADDS

- Scombrototoxicosis or histamine poisoning is a common type of food poisoning, with increasing frequency because of the food industry and consumption.
- Symptoms are unspecific and can be easily misdiagnosed as other common diseases, such as gastroenteritis or food allergy.
- Symptoms usually have a benign course, needing antihistaminic at most, but in rare cases can have severe manifestations, such as hypotension and respiratory distress.

Conflicts of Interest

The authors declare that there were no conflicts of interest in conducting this work.

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Confidentiality of data

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

References

1. Colombo FM, Cattaneo P, Confalonieri E, Bernardi C. Histamine food poisonings: A systematic review and meta-analysis. *Crit Rev Food Sci Nutr* 2018;58:1131-51. doi: 10.1080/10408398.2016.1242476.
2. Hungerford JM. Scombroid poisoning: A review. *Toxicon* 2010;56:231-43. doi: 10.1016/j.toxicon.2010.02.006.
3. Waldo OA, Snipelisky DF, Dawson NL. 46-year-old man with abdominal pain and hypotension. *Mayo Clin Proc* 2015;90:135-8. doi: 10.1016/j.mayocp.2014.05.021.
4. Souza AL, Calixto FA, Mesquita EF, Packness MP, Azaredo DP. Histamina e rastreamento de pescado: Revisão da literatura. *Arq Inst Biol* 2015;85:1-11. doi: 10.1590/1808-1657000382013.
5. Food and Drug Administration. Fish and fishery products. Hazards and controls guidance. 4th ed. Gainesville: FDA; 2011.
6. Taylor SL, Stratton JE, Nordlee JA. Histamine poisoning (scombroid fish poisoning): An allergy-like intoxication. *J Toxicol Clin Toxicol* 1989;27:225-40. doi: 10.3109/15563658908994420
7. Prester L. Biogenic amines in fish, fish products and shellfish: A review. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess* 2011;28:1547-60. doi: 10.1080/19440049.2011.600728.
8. Ricci G, Zannoni M, Cigolini D, Caroselli C, Codogni R, Caruso B, et al. Tryptase serum level as a possible indicator of scombroid syndrome. *Clin Toxicol* 2010;48:203-6. doi: 10.3109/15563651003649177.

Um Caso Clínico de Escorbrototoxicose

Resumo:

A escorbrototoxicose ou envenenamento por histamina é um tipo comum de intoxicação alimentar por peixe, com uma prevalência crescente devido às alterações na indústria e consumo alimentar. A histamina é uma amina não volátil resultante da ação de descarboxilases bacterianas presentes no peixe e os sinais e sintomas associados à sua ingestão ocorrem dentro de minutos a horas após o consumo de peixe e podem durar de algumas horas a vários dias, dependendo da concentração de histamina. Os sintomas típicos incluem eritema e rubor facial e no pescoço, além de desconforto generalizado, palpitações e cefaleia intensa. Pode também manifestar-se como dor abdominal intensa com diarreia e, em casos mais graves, com desconforto respiratório e

hipotensão. O diagnóstico é feito pela história clínica, sendo no estudo laboratorial a imunoglobulina E total e os seus níveis específicos em peixes normais. O tratamento depende da gravidade, pode não ser necessário, pode requerer apenas o uso de anti-histamínicos ou, em casos graves, pode ser necessário o internamento em cuidados intensivos para suporte inotrópico e/ou ventilatório. Os autores apresentam o caso clínico de um adolescente de 16 anos que recorreu ao serviço de urgência com sintomatologia inespecífica, mas que a história clínica cuidada permitiu o seu diagnóstico.

Palavras-Chave: Adolescente; Alimentos Marinhos/efeitos adversos; Contaminação de Alimentos; Doenças Transmitidas por Alimentos; Histamina/toxicidade