IAEM Clinical Guideline

Emergency Management of Histamine Fish Poisoning (Scombrotoxic Fish Poisoning, Scombroid, Pseudo Allergic Fish Poisoning, Mahi Mahi Flush) / Histamine Poisoning in Adult Patients

Version 1.0

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Disclaimer

IAEM recognises that patients, their situations, Emergency Departments and staff all vary. These guidelines cannot cover all clinical scenarios. The ultimate responsibility for the interpretation and application of these guidelines, the use of current information and of a patient's overall care and wellbeing resides with the treating clinician.

Revision History	Section	Summary of Changes	Author
Final version V1.0	All		

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GLOSSARY OF TERMS

CDC	Centers for Disease Control and Prevention
CIDR	Computerised Infectious Disease Reporting System
DPH	Department of Public Health
ED	Emergency Department
EFSA	European Food Safety Authority
EHO	Environmental Health Officer
FSA	Food Safety Authority
FSAI	Food Safety Authority of Ireland
H1	Histamine 1
H2	Histamine 2
HDC	Histidine decarboxylase
HPSC	Health Protection Surveillance Centre
MOH	Medical Officer of Health
NPIC	The National Poisons Information Centre
SFPA	Sea-Fisheries Protection Authority
UK	United Kingdom
USA	United States of America

Emergency Management of Histamine Fish Poisoning (Scombrotoxic Fish Poisoning, Scombroid, Pseudo Allergic Fish Poisoning, Mahi Mahi Flush) / Histamine Poisoning in Adult Patients

INTRODUCTION

Histamine fish poisoning/histamine poisoning is a syndrome resembling an allergic reaction that occurs after eating food contaminated with high levels of histamine. It occurs a few minutes to a few hours after ingestion of contaminated food, typically fish or cheese.[1] Commonly, patients present with flushing of the skin, an urticarial rash,[2] diarrhoea, visual disturbance, light headedness and headache shortly after the ingestion of the contaminated food.[1] Recovery occurs after a few hours.[3] The condition can go unrecognised, with patients who present with this illness receiving treatment for another illness such as anaphylaxis and receiving a diagnosis of a food allergy.[4]

PARAMETERS

Target audience: This guideline is intended for all Emergency Department staff managing adult patients with acute histamine poisoning.

Patient population: The target patient population is adult patients presenting to the ED with acute histamine poisoning.

AIM

To provide an evidence-based guideline for the assessment and management of adult patients presenting to the Emergency Department with acute histamine poisoning.

DEFINITION OF HISTAMINE FISH POISONING/HISTAMINE POISONING

A person with clinical symptoms and a food history consistent with marine biotoxin ingestion (or other potential food sources, such as cheese). Diagnosis is made on clinical presentation but toxins may be identified from the suspected food source. [3, 5]

CAUSATIVE AGENT

The syndrome is caused by the ingestion of histamine. Inadequate refrigeration allows multiplication of bacteria (e.g., Morganella morganii, Escherichia coli, Klebsiella species and Pseudomonas aeruginosa) found in the fish's cutis and intestines which contain the enzyme histidine decarboxylase (HDC). HDC converts histidine in fish tissues to histamine.[6] Subsequent cooking or smoking does not diminish the levels of histamine. Histamine can also be present as a consequence of fermentation in the production of foods such as certain cheeses or sausages. [3]

Epidemiology

Histamine poisoning occurs worldwide, and it is considered one of the most common forms of toxicity caused by fish consumption.[7, 8] In Ireland, between 2020 and 2023 there were 9 cases of probable histamine poisoning referred to the Food Safety Authority of Ireland (FSAI); 8 associated with tuna and 1 associated with mackerel. During this time elevated histamine levels were reported to the FSAI from 11 batches; 5 batches of cheese, 4 of tuna and 2 of mackerel, some of which led to FSAI issuing food alerts on their website.[9, 10]

Toxicity

Those eating the same meal may experience variation in symptom severity due to individual differences in sensitivity to or metabolism of histamine, the size of portion consumed, the amount of histamine in the consumed portion and whether the portion was from the same fish.[3, 10, 11]

Reservoir

Histamine fish poisoning is a foodborne illness most commonly caused by consuming certain species of marine fish such as tuna, herring and mackerel, that have naturally high levels of histamine and possibly other biogenic amines in their tissues. After fish, cheeses are the most common food associated with histamine poisoning.[10] The reservoir is primarily in inadequately preserved and improperly refrigerated fish.[3] Approximately 100 different species have been implicated. The most commonly affected is scombroid dark-meat fish such as tuna, mackerel, skipjack, bonito and marlin. Non-scombroid species may also be affected such mahi-mahi (dolphin fish), amber jack, sardine, yellowtail, herring, and bluefish. White fish is very rarely affected. Histamine poisoning has also been associated with the consumption of cheese and other fermented foods such as sauerkraut, miso, vegetables and soy sauce.[3]

Incubation period

The incubation period is 2 minutes to 2 hours after ingestion.[1, 12]

Transmission

Person-to-person spread does not occur.[3]

Suspected fish/foods should be discarded to prevent further cases, as cooking, canning, smoking, or other processing does not diminish the levels of histamine.[3]

Prevention

Temperature control is crucial in preventing histamine fish poisoning. The Food Safety Authority of Ireland and the Irish Sea Fisheries Board highlight the importance of proper handling and chilling of fish from time of catch through to transportation, processing, storage and distribution.[10, 13, 14]

European legislation states that scombroid fish species should be tested for the presence of histamine and mean values should be <100mg/kg.[13]

RECOGNITION OF HISTAMINE FISH POISONING/HISTAMINE TOXICITY

Patients may present with the following symptoms:

- Flushing
- Sweating
- Rash
- Diarrhoea
- Vomiting and/or abdominal pain
- Headache

Occasionally patients may also report a metallic taste or burning/swelling of the mouth.[15] Typically, patients will present shortly after ingesting food that is prone to histamine contamination.[12, 16]

A patient presenting with signs of allergy shortly after ingestion of foods associated with histamine contamination should alert the treating clinician to consider the possibility of scombroid toxicity.

Diagnosis is based on clinical symptoms and history of fish or suspect food consumption.[15]

Laboratory tests for cases are **not** indicated.

Patients with a history of atopy or those taking medications such as isoniazid or doxycycline, which slow histamine metabolism by the liver, may have more severe symptoms or prolonged illness.[15] Rare complications including bronchospasm, angioedema, hypotension, pulmonary oedema, and cardiogenic shock have been reported.[16] Long term health consequences have not been reported.[15]

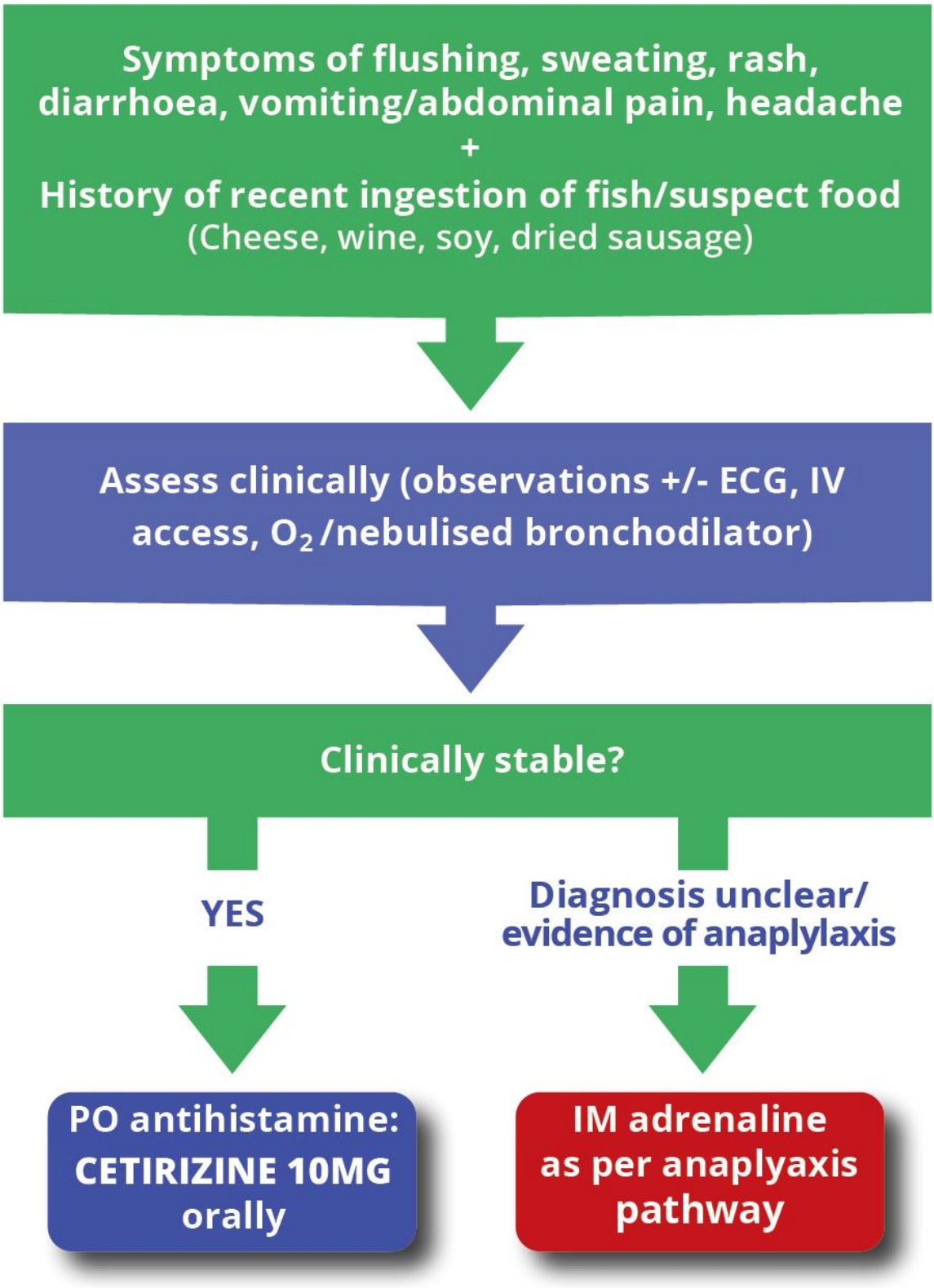
TREATMENT OF HISTAMINE FISH POISONING/HISTAMINE TOXICITY

1. For patients with minimal symptoms of histamine toxicity, reassurance and observation may be the only treatment necessary. If clinically necessary, obtain an ECG and intravenous access, oxygen, and cardiac monitoring.
2. H1 and H2 antagonists can provide symptom relief. The majority of patients can be appropriately managed with an oral antihistamine[15].

Cetirizine 10mg orally is appropriate

3. Some predisposed patients with a history of atopy may require oxygen and nebulised bronchodilators[17, 18]
4. If there is any evidence of airway obstruction or if the patient is presenting as acute anaphylaxis or the diagnosis of histamine poisoning is in doubt these patients should be treated with **IM adrenaline as per the anaphylaxis pathway.** Hypotension may be treated with IV fluids and rarely pressors[18]. Note: Administration of adrenaline, in the mistaken belief that the patient is experiencing an acute allergic reaction, will also result in the rapid resolution of symptoms. [17]
5. Extremely rare reported cases of myocardial dysfunction, ischemia, or infarction related to histamine fish poisoning exist; standard treatment for these complications should be used.[19]

EMERGENCY MANAGEMENT OF HISTAMINE POISONING



Ongoing management

Most cases of histamine fish poisoning are self-limited. Duration is less than 6 hours. However, comorbid atopic conditions such as asthma have been reported to extend course duration and severity.[20]

Patients should be observed in the emergency department for resolution of their symptoms. Typically, patients will have recovered within 2 hours of receiving antihistamines. Even patients with severe features often improve within hours of treatment.[21-24]

The vast majority of patients may be discharged from the ED with oral H1- and H2-antagonists for the next 3-5 days. Headache often responds H2 antagonist treatment. The patient may return to normal activity as tolerated. [18]

Onward referral

Complications are rare and the majority of patients do not require follow-up.

Most can be discharged home without the need of consultation for medical management or admission. Those with severe bronchospasm, evidence of shock, or arrhythmias may warrant observation for up to 24 hours. Hospital admission is required only under exceptional circumstances such as severe comorbidity or refractory toxicity that requires respiratory or pressor support.

Consultation may be requested from the local public and environmental health departments to help confirm the diagnosis and prevent additional cases, especially if the source was thought to be public. The National Poisons Information Centre (NPIC) may be contacted if the diagnosis is in doubt, though they do not usually advise on histamine fish poisoning or other food-related poisonings.

Notification to Public Health

A suspected cluster of histamine poisoning is notifiable to the Medical Officer of Health (MOH) in the associated Public Health Area (PHA) teams. The contact details for the MOH/Public Health Areas and the counties they cover are available on the HPSC website. Specific cases may be discussed with the local PHA team to support case finding and inform outbreak detection. Notifications may be made in writing, by email or by telephone.

Individual, sporadic and isolated cases may be referred to the Food Safety Authority of Ireland (FSAI) Advice Line by submitting a complaint here or by calling 0818 336677. For any incident notification outside of normal working hours, the FSAI can be contacted on their emergency/out of hours phone line on 01 6856555. Isolated cases may also be referred to the local Environmental Health Office, contact details for all Environmental Health Offices can be found here.

Education

Patients may express concern about future allergic reactions to fish and seafood. The patient should be provided with reassurance that their illness resulted from improper fish handling and storage, not from an allergic reaction. Patients should be educated on the proper storage and preparation of fish prior to ingestion. Patients should be advised to discard any suspected foods.[1, 22, 25]

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