

Scombroid Poisoning from Canned Tuna Ingestion

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ABSTRACT

Fish allergy is well recognized, however scombroid poisoning or histamine fish poisoning, which exhibits identical clinical manifestations, is rarely diagnosed. We report the case of a 28-year-old female who, after eating tuna spaghetti, experienced a flushed face, generalized erythema, angioedema, shock and tachypnea requiring adrenaline, chlorpheniramine, ranitidine, and hydrocortisone injections. Her symptoms completely resolved within 3 hours. Her condition was diagnosed as scombroid poisoning based on temporality, normal serum tryptase levels (2.7 ng/mL) at 2.5 hours and at her baseline (2.5 ng/mL, 60 hours), as well as negative results on skin-prick test and re-challenging one can of the same branded-tuna orally. The relevant public health authorities were notified and a restaurant-visit was made, although the tuna can from which the patient's dish was prepared had been discarded, hence a histamine analysis of the tuna was unavailable. This case underscores the need for awareness of scombroid poisoning and public interventions regarding food safety.

Keywords: Scombroid poisoning; histamine intoxication; scambrotoxin; tryptase; fish poisoning (Siriraj Med J 2017;69: 220-222)

INTRODUCTION

Fish is considered a nutritious meal containing nutrients beneficial to the heart, both for the general public and also for patients with cardiovascular diseases. However, illness related to fish consumption is well recognized. This can result from naturally accumulated toxins in fish via food chains, decomposition hazards, pathogens, chemicals, metal contaminations as well as other ingredients used in cooking.¹

We have reported a case of scombroid poisoning. As allergic reactions from fish consumption and scombroid poisoning are clinically identical, we emphasized the importance of distinguishing between the two through accurate diagnosis measures. We also reported on the public health interventions successfully carried out in our patient.

CASE REPORT

A 28-year-old female physician experienced a flushed face and generalized erythema 15 minutes after eating "Thai drunken tuna spaghetti". A friend who dined with

her had tuna salad and developed similar symptoms that resolved after taking 4 mg of chlorpheniramine. The common ingredient consumed by the two in their respective meals was canned tuna.

While our patient regularly eats tuna without experiencing allergic reactions, she had experienced identical symptoms on one occasion approximately two weeks prior, after eating the same dish at the same restaurant. However on that occasion the symptoms resolved after taking 4 mg of chlorpheniramine.

On the latter occasion, our patient's symptoms persisted despite taking 4 mg of chlorpheniramine and 10 mg of cetirizine. Her initial temperature was 36.7°C, blood pressure 104/44mmHg, faint pulse rate 136/minute and respiratory rate 30/minute. Generalized erythema, swollen eyelids and lips were noted. Lung sounds were clear. She was treated at the emergency department by administration of intramuscular chlorpheniramine (5 mg), adrenaline (1:1000, 0.5 mL) and intravenous ranitidine (50 mg), normal saline (500 ml) and hydrocortisone (100 mg) with diagnosis of anaphylaxis. Her symptoms

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improved gradually and completely resolved within 3 hours. Her hemodynamic parameters at baseline and after treatment included body temperature 37.2°C, blood pressure 108/65 mmHg, pulse rate 76/minute and respiratory rate 12/minute. She was admitted for observation overnight. Serum tryptase levels were within normal limits (2.7 ng/mL) at 2.5 hours and at her baseline (2.5 ng/mL, 60 hours). A skin-prick test and oral re-challenging one can of the same-branded tuna revealed negative results. A diagnosis of scombroid poisoning from canned tuna ingestion was made. The Bureau of Epidemiology, Ministry of Public Health and Food and Drug Administration (FDA) Thailand were notified. A restaurant-visit was carried out, although the tuna can from which our patient's dish was prepared had been previously discarded. The owners of the restaurant confirmed that they purchased canned tuna from a local supermarket. They also confirmed that they kept canned tuna well refrigerated prior to opening, and did not keep opened cans overnight. They misunderstood that heat from cooking would destroy all food toxins and considered that the patient was probably allergic to tuna. Health education regarding food safety was provided to the restaurant owners. We called for surveillance amongst Thai toxicologists and held a symposium on the subject of fish poisoning with food experts from the Food and Drug Administration Thailand shortly after the incident.

DISCUSSION

Because our patient's symptoms began shortly after the ingestion of tuna, normal tryptase levels, negative results on skin-prick test and oral re-challenge test, the diagnosis was made as scombroid poisoning. The onset of symptoms is minutes after ingestion of histidine-containing fish such as tunas, mackerels and bonitos that contain histamine which resulted from decarboxylation due to inappropriate storage temperature during fishery procedures or food manufacturing. Recent similar experiences after consuming the same dish and a cluster illness all support the food-related illness diagnosis – scombroid poisoning.² Equally, the fact that our patient regularly eats tuna without allergic symptoms opposes the diagnosis of allergic reactions. In our case, it was questionable whether the high histamine content was as a result of poorly refrigerated canned tuna becoming newly contaminated by bacteria at the restaurant, or whether it was due to a defect present from the fishery or food manufacturing process. McCarthy and associates reported that histamine concentration higher than 500 ppm was found in *E. pyrinus*-inoculated plain tuna salad

after 2 days at 30°C.³ This supports that a defect which took place during the fishery or food manufacturing process may be the etiology of histamine production contained in tuna ingested by our patient.

Clinical manifestations of scombroid poisoning and allergic reactions are similar as they both are caused by histamine. However, exogenous histamine causes scombroid poisoning while endogenous histamine release after mast cells degranulation is relevant in the case of allergic reactions. Treatment strategies are similar for both diagnoses; although, ingestion of the same type of food must cease in allergic reactions.² Histamine can only be detected during the first 30 to 60 minutes after anaphylaxis. A temporary rise of serum tryptase (a serine protease released during mast cell degranulation) levels is observed in patients with allergic reactions. In contrast, degranulation of mast cell does not take place in scombroid poisoning hence levels are within normal limits at any state. This observation was made in the case of our patient. Peak levels of serum tryptase occur approximately 30 minutes and increased levels can be detected until 5 hours after ingestion.^{4,5} It is important to note that serum tryptase level is not widely available and the turn-around time may take days, so we could not use this as therapeutic guidance. Moreover, serum tryptase levels may not elevate in a number of patients who have mild to moderate anaphylaxis.⁶ Severity of symptoms from scombroid poisoning can vary from mild with spontaneous improvement to catastrophic and life-threatening. Prognosis is good especially amongst those patients who receive early treatment and provided the source of exogenous histamine is eliminated.^{7,8}

Skin-prick test taken one month after the incident was negative in our patient. The negative predictive value for this test is above ninety-five percent.⁹ Oral food re-challenge by a can of the same-branded tuna did not elicit allergic reactions. It was concluded that our patient did not have an allergy to tuna.

A diagnosis of scombroid poisoning requires a high level of clinical suspicion, otherwise it is most likely that a diagnosis of allergic reaction will be made. The incidence of scombroid poisoning is underreported given a low level of awareness of this disease amongst healthcare personnel.⁷ Further education regarding fish poisoning and other toxicology-related illnesses should be emphasized in future medical education.

Public interventions should be pursued following the diagnosis of scombroid poisoning as it often involves consumer products potentially harmful to the public.¹⁰ Our notification of relevant public health agencies after this incident led to an increased level of awareness

and investigation, and enhanced preventive strategies concerning food safety in Thailand.

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Conflict of Interest Notification Page

Authors have no conflict of interest for disclosure.

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