HUMAN POISONING AFTER INGESTION
OF PUFFER FISH CAUGHT
FROM MEDITERRANEAN SEA

- A Case Report -

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Abstract

Puffer fish poisoning is due to a powerful neurotoxin produced by bacteria living in this kind of fish. Though the sea of Lebanon (Mediterranean) is not endemic of puffer fish and incidence of its serious poisoning is rare, yet occasional incidences do occur. The purpose of this presentation is to raise the awareness of fishermen, fish-restaurant frequenters, public health organizations and the Ministry of Health, of its serious symptomology and to seek medical help as soon as possible.

Case Report

A 68 year-old woman, with hypertension and diabetes, was brought to the Emergency Department of the Hopital Universitaire de Notre Dame De Secours, in January 2008 complaining of proximal limb weakness and dyspnea.

Four hours prior to her arrival, the patient had eaten a half-cooked fish liver. Three hours and thirty minutes later, she started feeling a tingling sensation in the perioral region and in the tip of her fingers associated with blurred vision, head heaviness, nausea and one episode of vomiting.

Ten minutes later, she lost her ability to hold her head up and had developed weakness of her upper and lower extremities. This was accompanied by mild abdominal distention and urinary urgency. The patient then developed quadriplegia, hypophonia and dysarthria. She complained of dyspnea, ophtalmoplegia and had an absent gag reflex. Subsequently, the patient underwent endotracheal intubation.

After intubation, the neurological examination revealed normal consciousness and orientation, bilateral third, fourth and sixth nerve palsies, normal pupillary reflexes, absent gag and cough reflexes and the deep tendon reflexes. Computed Tomography (CT) scan of the brain did not show any abnormalities.

Upon further questioning on the following day, the family reported that the fish was a blowfish and identified it by picture comparisons, as Lagocephalus scleratus (Fig.1 & 2).

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Between 1974-1983, the incidence of puffer fish intoxication was estimated to be as high as 200 cases per year, with mortality approaching 50%. Puffer fish poisoning is most commonly seen in Japan. Sporadic cases have been reported in the United States.

The different bacteria living in puffer fish liver, gonads, intestines and skin, are known to synthesize a very potent heat stable neurotoxin called “tetrodotoxin”.

Historically, the first recorded cases of tetrodotoxin poisoning were from the logs of Captain James Cook, the British explorer, navigator and cartographer during his voyages to the Pacific Ocean, late part of the 18th century. He recorded that his crew were eating some local tropic fish (puffer fish), and feeding the remains to the pigs kept on board. The crew experienced numbness and shortness of breath, while the pigs were all found dead the next morning. It is clear that the crew received a mild dose of tetrodotoxin, while the pigs ate the puffer fish body parts that contained most of the toxin, thus killing them.

The toxin was first isolated and named in 1909 by Japanese scientist Yoshizumi Tahara: Tetrodotoxin (anhydrotetrodotoxin 4-epitetrodotoxin, tetrodonic acid, TTX) (Fig. 3 & 4).

Poisoning from tetrodotoxin is of particular public health concern in Japan. “Fugu” is a traditional delicacy, prepared and sold in special restaurants where trained and licensed chefs carefully remove the viscera to reduce the danger of poisoning.

Pathophysiology

The toxin blocks the action potentials in nerves by binding to the pores of the voltage-gated, fast sodium channels in nerve cell membranes. Tetrodotoxin binds
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Tetrodotoxin intoxication is divided into four stages based on neurologic signs:

1 – Rapidly after ingestion (10 min to 2 hours) numbness and/or paresthesias of the lips and tongue and often of fingers occur.

2 – Sensory symptoms progress markedly.

3 – Muscular paralysis of extremities occur. Motor incoordination progresses and paralysis develops, but consciousness is maintained. Voice production is difficult because of bulbar muscle paralysis.

4 – Consciousness may progressively deteriorate and respiratory paralysis can cause death.

Our patient had eaten the liver of Lagocephalus scleratus, known to be one of the most dangerous fish species. The different bacteria living in puffer fish liver, gonads, intestines and skin, are known to synthesize a very potent heat stable neurotoxin “tetrodotoxin”. The diagnosis was made on the clinical manifestations and the recent dietary history. The onset of symptoms in our patient was more delayed than usual. Although she reached the third stage, she remained hemodynamically stable. Her consciousness was intact during all the paralytic period, and she returned to her baseline status over a short period. Even though the tetrodotoxin level was not determined in serum or urine, the clinical history, the progressive recovery and the kind of fish eaten (confirmed later by presenting the rest of the fish ingested by the patient), were all consistent with the diagnosis of puffer fish poisoning.

Conclusion

Since Puffer fish is not endemic in the shores of Lebanon, its poisoning is considered rare and potentially dangerous. Nevertheless with the increasing tourism and foreign fish importation, puffer fish poisoning may occur in Lebanon. The purpose of this presentation is to raise the awareness of this poisoning among fish eaters and to coerce the Ministry of Health to take the necessary actions towards the fishermen, the restaurants and educate the public, in order to avoid the ingestion of this kind of fish, to recognize it signs of poisoning, and in case of accidental ingestion to seek medical help as soon as possible.
Recommended readings


