

Puffer Fish Poisoning: A Family Affair

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INTRODUCTION

Tetrodotoxin poisoning has been commonly reported in Japan due to consumption of contaminated fugu (puffer fish). Poisoning is possible when the fish is not cleansed and dressed properly. Puffer fish is considered a delicacy by the Japanese as the fish meat is very tender and tasty. A certified chef trained in ways of preparing this poisonous fish should only be allowed to serve this fish. Despite careful preparation, this fish remains a deadly meal for many as 50 deaths are reported annually¹. An outbreak of 34 cases of tetrodotoxin occurred in Johor in May 2008. Here, we would like to report three cases of tetrodotoxin poisoning in a family who consumed this deadly fish and was admitted to Hospital Sultanah Aminah Johor Bahru (HSAJB).

KEY WORDS:

Puffer Fish, Tetrodotoxin, Poisoning

CASE REPORT

Patient A

A 43 year old Chinese cook in Johor Bahru bought a local puffer fish at Johor market in the beginning of this year. He cooked it on the same afternoon and served it to his family. The cook, who is a hepatitis B and C carrier, consumed about half the fish at 5 pm. Fifteen minutes later, he felt numbness at the perioral area, followed by numbness of his hands and feet. Subsequently, he felt giddy and vomited. On arrival to emergency department HSAJB, which was about an hour later, he developed progressive muscle weakness with respiratory and speech involvement. His Glasgow Coma Scale was poor (E3V1M1). He had a lot of upper airway secretions and was intubated for airway protection. An urticaria rash was seen throughout his body. The lowest blood pressure recorded was 102/54 mmHg with a pulse rate of 60-70 bpm, 5 hours after consumption of the fish. He was given intravenous fluid hydration, intravenous hydrocortisone, sedation using morphine/midazolam and oral activated charcoal through his nasogastric tube. He was transferred to the intensive care unit for ventilation and was extubated 36 hours post intubation. No inotropic support was needed. His muscle power was 5/5 upon extubation. Both his upper and lower limb numbness subsided at 60 hours after onset, followed by resolution of giddiness just before discharge at 84 hours.

Patient B

A 39 year old Chinese housewife, the sister of patient A, was also served the fish. She had a past history of bronchial asthma during pregnancy. She consumed 2 small portions of the fish at 5pm. Half an hour later, she vomited. This was

preceded by perioral numbness and numbness which progressed throughout her body. On arrival to emergency department HSAJB, she developed progressive muscle weakness with low Glasgow Coma Scale (E3V1M1) and had to be intubated for airway protection. Her blood pressure dropped after intubation to 77/56 mmHg with a pulse rate of 92 bpm, and was started on low dose IV dopamine of 2.5mcg/kg/min. She was given intravenous fluid hydration, intravenous hydrocortisone, sedation using morphine/midazolam and oral activated charcoal through her nasogastric tube. Nebulization was also given when required. She was transferred to the intensive care unit for ventilation and was extubated 24 hours post intubation. She was discharged well at 84 hours.

Patient C

A 37 year old Chinese man who is the husband of patient B. He was also served the fish but stopped after taking 3 small portions as he developed perioral numbness about 5 minutes after taking it. His portion was subsequently eaten by his brother-in-law (patient A). This was followed by increasing numbness over his hands and feet. He felt nauseated about 4 hours after taking the fish but didn't vomit. He sent both his wife and brother-in-law to the hospital. His numbness resolved at 16 hours followed by resolution of his dizziness before discharge at 60 hours. No ventilatory or inotropic support was needed. His blood pressure remained stable between 100/50 mmHg to 143/77 mmHg with a pulse rate of 53 to 77 bpm during hospitalization.

DISCUSSION

Puffer fish poisoning has been rarely reported in Malaysia². Our report highlights the seriousness but potential reversibility of tetrodotoxin poisoning. The tetrodotoxin poisoning in Johor is caused by "ikan buntal pisang".

Tetrodotoxin is in its highest level in the puffer fish's liver, gonads and skin. It must be removed with care as tetrodotoxin, a heat-stable and water-soluble toxin, is a powerful neurotoxin which will block neuronal transmission in skeletal muscle. Tetrodotoxin acts on the central and peripheral nervous system causing autonomic (relaxes vascular smooth muscle to produce hypotension), motor and sensory paralysis. It can also stimulate the chemoreceptor trigger zone to cause nausea and vomiting, and depresses the respiratory system.

The likely cause of poisoning in our patients was consuming puffer fish which was not properly prepared.

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Onset of symptoms with tetrodotoxin poisoning may occur within half an hour to as long as > 20 hours³. In our three patients, the onset of symptoms occurred within half an hour upon ingestion of the fish and resolved fully within 48 to 72 hours, consistent with previous reports⁴. The severity of tetrodotoxin poisoning is graded based on neurological and cardiovascular involvement⁵. Patients A and B had Grade 3 severity and patient C had Grade 1 severity. Respiratory muscle paralysis has been the predominant cause of death. However, prompt ventilation as in patients A and B prevents mortality.

Treatment is totally supportive including ventilation and inotropic support as there is no proven antidote for tetrodotoxin. Activated charcoal is effective in binding the toxin but cholinesterase inhibitors with atropine, steroids and antihistamine have yet to be proven for the treatment for tetrodotoxin poisoning.

Our three patients were discharged well due to early diagnosis and prompt management. As such poisoning may occur in future, physicians should be familiar with the diagnosis and management of tetrodotoxin poisoning.

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