

Introduction

Mercury is a serious threat to public health. Mercury toxicity, while not common, can be easily missed if a precise history is not taken, including details regarding occupation or dietary habits. The health effects of exposure to mercury have been well documented. Significant organic mercury exposure causes acute GI and respiratory symptoms, as well as neurologic symptoms such as deafness, decreased visual field, paresthesia, and ataxia. In general, there are three categories of mercury exposure: elemental, organic, and inorganic. As each exposure type is associated with different presentations, eliciting an accurate history is valuable when suspecting mercury poisoning. Organic mercury exposure, as discussed in this case, results mainly from consumption of mercury-contaminated fish (i.e. swordfish, tuna).

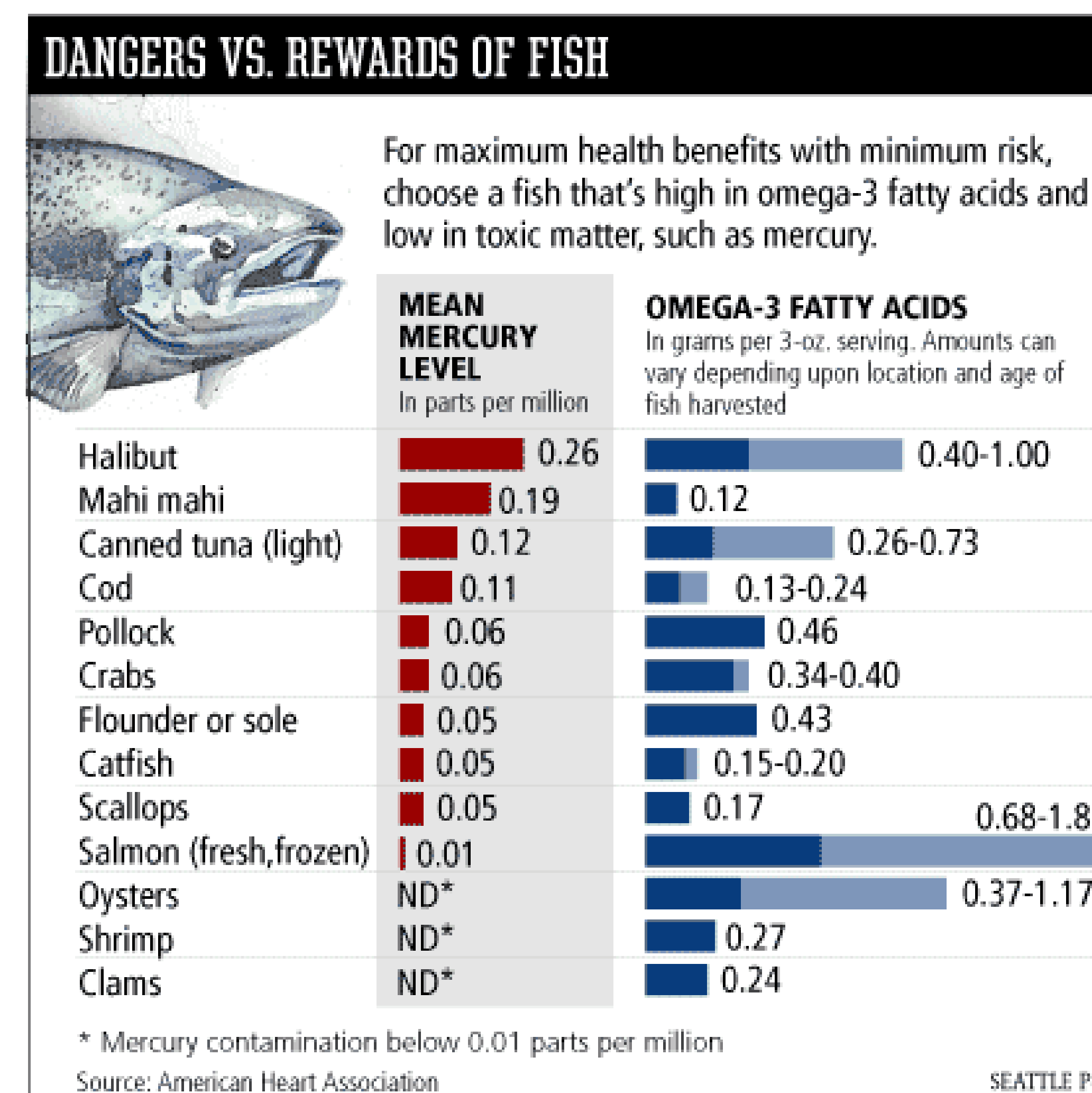


Figure 1: Mean mercury levels in parts per million in types of fish (Source: American Heart Association)

Since there was no obvious etiology for the patients' neuropathy, more detailed history was obtained, and he admitted to a diet that composed entirely of seafood, particularly fish. Subsequently, his mercury level was noted to be 20 mcg/L (N: <5 mcg/L), while his urine mercury level was unremarkable. The patient was diagnosed with chronic mercury poisoning with irreversible neurological complications. Since there is no effective treatment for toxic organic mercury exposure, no chelation therapy was attempted. The patient was discharged home and recommended to avoid consuming fish and other seafood.

Discussion

The symptoms of mercury toxicity depends on the exposure to the three categories of mercury toxicity: elemental, inorganic, and organic. Chronic consumption of organic mercury compounds has caused severe epidemics of poisoning in Japan in the 1940s and Iraq in 1971, where fish is a staple food. The most common method of exposure is via consumption of mercury-contaminated fish. In this type of exposure, patients typically present with neuropsychiatric symptoms such as depression, anxiety, psychosis, and neuropathy. Over time, mercury poisoning can lead to severe neurologic toxicity, respiratory complications and nephrotoxic complications.

Organic mercury is lipophilic and this quality enables its distribution to the CNS and passage across the placenta. As organic mercury is eliminated in feces, urine mercury testing is not reliable. The preferred test for organic mercury toxicity is a whole blood mercury level.

Unlike elemental and inorganic mercury poisoning, CNS toxicity secondary to exposure to organic mercury is resistant to chelation. Chelation with dimercaprol is not recommended because it increases the mobilization of mercury to the brain. Thus, having a high index of suspicion is important in patients with peripheral neuropathy of unclear etiology in order to diagnose mercury poisoning.

References:

1. Dangers vs. rewards of fish [GIF]. (n.d.). American Heart Association.
2. Mercury Toxicity .Retrieved October 23, 2017, from https://www.uptodate.com/contents/mercury-toxicity?source=search_result&search=mercury-poisoning&selectedTitle=1~112

Clinical Case

A 42 year-old-male with no significant past medical history, resident of New York City, presented with right third toe and left first toe pain, deep wounds, swelling, and erythema in the plantar area that extended to the dorsum of the foot for about 3-4 weeks. Associated symptoms were numbness, weakness, and tingling of lower extremities, as well as depression, anxiety, and irritability for six months. He denied any fever, chills, nausea, vomiting, dyspnea, chest pain, cough, skin rash, forgetfulness, and suicidal thoughts.

On physical exam, vital signs were within normal limits. The patient was found to have malodorous deep wounds but no active discharge of right third toe and left first toe. The right third toe had dry gangrene. Glove-and-stockings sensory loss extending to mid legs bilaterally with decreased deep tendon reflexes, mild muscle weakness was also present. Empirical antibiotics were started and the patient underwent amputation of right third toe. His blood and bone cultures were positive for Methicillin-susceptible *Staphylococcus aureus*.