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# Haff Disease

## The Socrates, Baltic Coast and hemlock connection

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**JOSEPH DANIEL FIEDLER ILLUSTRATION**

Haff Disease is a rare medical diagnosis with links to Socrates, the Baltic Sea and Louisiana. A form of hemlock poisoning is the common factor uniting the ancient world, the Old World and our little slice of paradise near the mouth of the Mississippi River. Physicians from a brackish inlet of the Baltic Sea with Haff in its name first wrote about this disease in the 1920s. Even though case numbers are small, Louisiana is the epicenter for Haff Disease in the New World.

The Socrates connection came to mind as I read a recent issue of the Louisiana Morbidity Report, a bimonthly publication from our state's Office of Public Health. Mallory Becnel, an epidemiologist, penned a brief case report describing a 62-year-old Louisiana woman hospitalized with what turned out to be a form of hemlock poisoning. Unlike Socrates, this unnamed woman wasn't a self-described gadfly or an accused corrupter of youth. She just liked fried fish.

Becnel wrote that Patient X bought frozen buffalo fish from a “traveling vendor” last January. She must have been hungry, and the fish must have been tasty, as she fried and ate four pieces around midnight. Seven hours later she tucked away the leftovers for breakfast, and later that morning her troubles began. Her arms, back and chest began to ache. Nausea followed. She turned to her local emergency room for help.

The emergency room physician initially suspected an acute gastrointestinal problem and ordered a GI (gastrointestinal) cocktail, the Green Goddess, emergency room lingo for a stomach cure-all. Each emergency room has its own recipe, but a typical GI cocktail is an ounce of Mylanta mixed with equal parts liquid Donnatal and Lidocaine. The Donnatal supposedly helps with stomach cramping and gives the mixture its signature pale green color. The Mylanta helps with dyspepsia, and the lidocaine numbs the mouth, the sure signal of a powerful potion.

Since she also had chest pains, the emergency room physician ordered a battery of blood tests to make sure she wasn't having a heart attack. When the results came back, concerns heightened. Her level of creatine phosphokinase (CPK) was sky-high at 6300; normal is less than 400. This abnormality was the lady's ticket to a larger hospital, as high CPK levels can signal the presence of several serious medical problems.

Further testing showed Patient X actually had normal levels of cardiac CPK. The high levels of CPK were coming from her skeletal muscles, which explained all of her body aches and pains; but why? Muscle cells contain large amounts of CPK well-contained behind cell membranes. Anything that disrupts muscle cells causes an outpouring of CPK into the bloodstream. Circulating muscle goo is toxic to kidneys.

Her new physician, not identified in Becnel's report, did what doctors are trained to do. He or she took a history from the patient. All the expensive testing and imaging in the modern day medical armamentarium don't replace a history taken from the patient by the treating physician. This takes an involved attending physician, not a physician who simply reviews a nurse or intern's history. In this situation, her physician made the link between recent fried fish consumption and muscle aches and pains. Her situation fit Haff Disease.

Just after World War I, German physicians first reported sporadic outbreaks of Haff Disease traced to consumption of cooked freshwater fish. These outbreaks were more common during fall and winter, and were traced to several species of bottom-feeding fish. The illness began suddenly with severe muscle pains and urine the color of coffee. Most victims completely recovered after a few days, but there were some deaths.

The first reported case in the United States occurred in Texas in 1984. Scientists now believe Haff Disease is caused by human consumption of fish and other swimming creatures that have feasted on toxic plants. Water hemlock, probably our most toxic native plant, grows in and alongside ponds and streams. The toxin becomes more concentrated as its tubular roots mature.

The buffalo fish is the culprit species most associated with Haff Disease in the United States. These are bottom- and filter-feeders that look like carp.

They normally eat small crustaceans, snails and other tasty bottom creatures, but they aren't averse to a salad of algae and plant parts when hungry. If the fish eats plant roots containing hemlock toxin, any human who then eats the fish is in for an unexpected jolt.

Symptoms always begin within 24 hours of eating the contaminated fish, which looks and smells like any non-contaminated fish. Cooking destroys most bacterial pathogens, but the hemlock toxin isn't heat-sensitive.

There is no specific antidote for Haff Disease. The treatment consists of liberal intravenous fluids to help the kidneys flush out the released muscle cell contents circulating in the blood. Activated charcoal can help if the toxin-containing food is still in the gastrointestinal tract.

The last diagnosed case of Haff Disease in Louisiana occurred in 2002, according to Becnel's report. Surely other tasty swimming creatures also ingest some of this poisonous waterweed every once in a while. What about crawfish? Louisiana actually had a Haff Disease outbreak related to crawfish in April '01. Public health authorities identified at least eight cases. All became ill three to 16 hours after eating boiled crawfish from the same source. Five were hospitalized, but all quickly recovered. In addition, Haff disease outbreaks in other states have been traced to buffalo fish caught in Louisiana and Missouri.

Since water hemlock is so widespread in our swamps and marshes, this disease probably occurs much more frequently than it's diagnosed. And what's with the buffalo fish? I suspect it boils down to a minimal toxic dose of the toxin. Persons who eat crawfish that have dined on water hemlock probably don't ingest enough of the toxin to cause a trip to an emergency room so their exposures are never detected. A large piece of fried buffalo fish, on the other hand, delivers a sudden, concentrated dose of the poison.

There is no test I know of to screen fish or crawfish for this disease. The best general advice I can give is to keep your diet varied and don't hog out on any single food. There is definitely a dose-related response here.