

Diagnosis and Management of Foodborne Illnesses

A Primer for Physicians and
Other Health Care Professionals

Unexplained Illness

Patient Scenario

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February 2004

This learning scenario can be used to reinforce medical information pertaining to foodborne illnesses, such as that provided from the previous sections of this primer. This case study provides questions that need to be considered when dealing with a potential case of foodborne illness. Answers are provided immediately following the questions to enhance the learning process.

Similar learning scenarios are also available for other foodborne illnesses.

Unexplained Illness, a Patient Scenario

You have been a primary care practitioner in Manhattan, NY, for several years. Jack, a 29-year-old otherwise healthy male, has been your patient for the past year. At 0800 he calls your triage nurse complaining of a very sudden onset of nausea, cramps, coughing, and sweating. The nurse is concerned about the suddenness of onset and wants to know what you would like to do.

Should you have him call again later if he does not improve? Should you have him make an acute-visit appointment, or should you send him to the emergency room?

You are concerned about the suddenness of the onset of symptoms but not the severity, so you decide to have him come to the office immediately.

Jack presents in your office 30 minutes later. In addition to nausea, cramps, coughing, and sweating, his eyes have begun to tear uncontrollably and he complains of having had difficulty breathing while en route to the office. Upon arrival, he immediately asks to use the bathroom.

Jack reports that he started his morning routine as usual with a run. Upon returning home, he finished drinking the bottle of water he had purchased earlier from the local deli and began to get ready for work. By the time he had finished showering and dressing, he began to feel sick to his stomach. He then developed cramping but no diarrhea. Shortly thereafter, he began to have bouts of uncontrollable coughing.

He does not know when the sweating started. He states that he had difficulty breathing while en route to the office, and that the tearing just started. He denies vomiting, hemoptysis, hematuria, bright red blood per rectum (BRBPR), chills, fever, headache, myalgia, arthralgia, or diarrhea. Jack also denies the use of any medication, other drugs or alcohol, “That stuff rots your gut.”

Jack reports that he finished his run at about 0700. It is now 0900.

Despite having just urinated, he states that he must go again and immediately. However, Jack experiences incontinence on his way to the bathroom. Upon his return to the exam room, you notice a slight tremor in his left arm. He states that this has only just begun.

What preliminary diagnosis can you make at this point?

An anxiety attack

A viral syndrome

A potential foodborne illness

Anticholinergic poisoning

You are not ready to reach a conclusion at this point, so you move to a physical exam and observe the following:

Objective:

Respiration rate: 20

BP: 92/60 mm Hg.

Heart Rate: 50

Temperature: 98.6°F (37°C)

You note that Jack is anxious but oriented to time, place, and person. His head, ears, eyes, nose, throat (HEENT) examination shows bilateral miosis and decreased reactivity. There are no signs of trauma or bleeding. His heart has regular rate and rhythm, no murmur, and good perfusion. Radial and dorsal pulses are 2+. His lung examination reveals scattered wheezing. His abdomen is soft, nontender, not

distended, with increased bowel sounds, and no mass. Extremities appear within normal limits. The neurologic exam reveals the slight tremor in his left arm, slightly slurred speech, excessive salivation, and transient fasciculations in both upper extremities. You note negative Babinski and his cranial nerves (CN) 2-11 appear intact, while CN 12 appears slightly abnormal.

What other information would assist with the diagnosis?

More history from Jack, including most recent activity and diet.

You now seek additional history. Jack lives alone and does not believe that he has been in contact with anyone who is ill. He works in an office as a lawyer. His run takes him up 5th Avenue and then over to 3rd Avenue, then back home. He does not run through Central Park. He does not have plants and does not garden as a hobby. His most recent meal was the night before, about 10 hours prior to the onset of his symptoms. It consisted of boiled pasta, steamed broccoli, and olive oil. He prepared the meal himself. He states that he carefully washed the broccoli, the oil was from a bottle he opened last week, and the pasta was from a box he had already used 2 days before. All he had to drink was tap water with dinner last evening and the bottled water from this morning.

Jack's presentation appears to involve which of the following systems?

- Autonomic nervous system
- Lymphatic system
- Central nervous system

The signs and symptoms in Jack's presentation predominantly involve increased autonomic responses, and are perhaps progressing to include the central nervous system as well. You decide that immediate treatment is called for and order oxygen, atropine, and pralidoxime (2-PAM). Given that Jack does not appear to have been exposed dermally, the most likely route appears to have been oral. Therefore, you also appropriately begin an IV with normal saline.

What is the initial diagnosis?

This presentation is not consistent with bacterial, viral, or parasitic food poisoning. While the signs and symptoms indicate acute organophosphate poisoning, the history provides no indication, and indeed seemingly contradicts this theory because of the lack of exposure. There has been no exposure to places where organophosphates are typically used, such as on lawns, house plants, and parks. Nevertheless, Jack has presented with a fairly classic case of organophosphate poisoning. Therefore, ingestion must be considered. Since you have no suggestion of deliberate ingestion on Jack's part, it must be assumed that he has consumed the organophosphate unintentionally.

Organophosphate poisoning has an onset of 30 minutes to 2 hours. Jack has actually made it easy to identify the most likely source: the only thing he has consumed in 10 hours is water. The broccoli could have had pesticides on it that may not have been removed when Jack washed it, but then he would have developed his symptoms during the night. Taking into account the temporal relationship between his ingestion of the bottled water and the onset of his symptoms, the bottled water seems the most likely candidate.

Given this information, what are key questions you should consider?

Is the water truly contaminated?

If it is, how did it become contaminated?

Who else may have ingested it?

Who else is at risk?

What action should be taken?.

You realize that if your diagnosis and conclusions are correct then a public health hazard may exist. Two things need to be done. First, the health department must be contacted, and second, tests need to be done that will confirm your diagnosis. While the usual work-up for organophosphate poisoning is clinical diagnosis, there are assays

available to measure cholinesterase activity in plasma and red blood cells. It is also possible to detect some pesticides in urine. You decide to order both tests as this will provide the greatest insight into what the possible exposure is for other people in Jack's building, neighborhood, or even his city.

When communicating with the local public health department, whom should you ask to speak to concerning this situation?

The medical epidemiologist?

The medical director?

The infectious disease officer?

You ask to speak with the medical director. You present Jack's case, making careful note of the time course, and also inform the medical director of your suspicions of the source. The medical director takes this information and agrees with your concerns. She then asks you to speak with the chief epidemiologist so that an investigation can begin.

In many large cities, there is a city health department; in smaller cities or towns, it will usually be necessary to contact the local or state health department. Try to match the level with the greatest number of people who may become affected. Other persons who may be of immediate help if you cannot reach the medical officer are the epidemiologist or even an environmental health officer. These people will most likely know what to do with the information you have.

Most health departments across the country have been working to increase their knowledge or at least their awareness of the possibility of intentional contamination. Many have also created positions solely devoted to this task. Therefore, it is possible that you will be directed to such an individual.

The health department initiates an investigation that includes testing the water; looking for other cases of organophosphate poisoning; interviewing the patient; notifying other parts of the public health system, including law enforcement, CDC, and the state health department; they may even issue a public notice.

There is another possible cause for the case you have just seen: sarin gas can cause a similar presentation. If sarin gas had been sprayed into the air, it is possible that Jack could have respiratory exposure to the nerve gas.

If this were true, how would it change what you did?

Persons exposed to sarin, and possibly other nerve agents, will have a clinical presentation similar to those with organophosphate poisoning. Hence, medical management will likely be similar.

Finally, you are gratified to have helped detect a possible act of contamination that could potentially harm or even kill a great many people. Afterward, while making rounds in the hospital that day you are told by a colleague that a number of runners from a 5K race in Central Park this morning and tourists visiting the Empire State Building were brought to the emergency room complaining of sudden onset of nausea, cramps, and coughing. It was reported that all had been drinking bottled water.