

Water Can Kill?

Exploring Effects of Osmosis

by

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Part I – Three True Stories

Case 1: Jennifer Strange^{1,2}

Jennifer Strange was a 28-year-old mother of three who entered a radio contest to try to win a Nintendo Wii game system for her children. As part of KDND’s “Hold your wee for a Wii” contest, Jennifer drank bottle after bottle of water for hours without urinating.

Initially, Jennifer seemed to be having fun, joking lightheartedly with the radio hosts and obligingly downing an 8-ounce bottle of water every 15 minutes. As the hours passed, however, she developed a splitting headache and dizziness. Finally, she couldn’t take it anymore and ran to the bathroom and vomited.

Jennifer called her boss to say that she was going home for the day because her headache was excruciating and she was too sick for work. Jennifer’s mother found her that afternoon, dead in her home.

*Case 2: Cassandra Killpack*³

After a 3 ½-week trial, a jury found Jennete Killpack, 29, guilty of killing her 4-year-old adopted daughter Cassandra by forcing approximately a gallon of water down the girl’s throat in an attempt to discipline her.

A few hours after the “hydro-discipline,” the Killpacks called the paramedics because Cassandra was unresponsive. The paramedics delivered her to the hospital, where she died later that day. Medical investigation found that Cassandra’s brain was swollen and the concentration of sodium in her blood and tissues was far below normal.

*Case 3: James McBride*⁴

James McBride, a 25-year-old police officer, died after a 12-mile bike ride that was part of a training course. Over the course of the ride, James drank roughly three gallons of water that he brought with him in a pack.

During a session that focused on how to dismount a bike, an instructor noticed that McBride looked ill and asked him to sit down. McBride complained of dizziness and nausea, and then vomited. Officers initially thought he might have suffered heat stroke. Unaware that James had already consumed so much water, they gave him more water to cool him down while he sat out of the exercise.

When another officer hurt himself during the exercise, an ambulance was summoned. The paramedics noticed that James was convulsing and continuing to vomit, so they brought him to the hospital. He died in the hospital the next day.

Hyponatremia Fact Sheet

Source: The following information is from the article “Hyponatremia” in A.D.A.M. Medical Encyclopedia, April 14, 2013, at <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001431/>.

Hyponatremia is a metabolic condition in which there is not a high enough concentration of sodium in the body fluid surrounding cells.

Causes, Incidence, and Risk Factors

Sodium is found mostly in the body fluids outside of cells (though there is some sodium inside of cells). When the concentration of sodium in the body fluid drops, this creates a hypotonic environment outside of cells; this results in water moving into cells, causing them to swell. Most cells in the body can handle slight swelling, but brain cells cannot because they are confined by the skull bones. Brain swelling (pressing the brain tissue against the skull) causes most of the symptoms of hyponatremia.

Hyponatremia is the most common electrolyte disorder in the United States. Causes include burn, congestive heart failure, diarrhea, excess urination (due to a diuretic), kidney diseases, liver cirrhosis, excess sweating, and vomiting.

Symptoms

Common symptoms of hyponatremia include confusion, decreased consciousness, hallucinations, coma, convulsions, fatigue, headache, irritability, loss of appetite, muscle spasms or cramps, muscle weakness, nausea, restlessness, and vomiting.

Signs and Tests

The following laboratory tests can be done to confirm hyponatremia:

- Comprehensive metabolic panel, including blood sodium concentration.
- Osmolality blood test (which checks the concentration of solutes in the blood).
- Osmolality urine test.
- Urine sodium test.

Treatment

If an underlying condition is causing the sodium/water imbalance, then treating the underlying condition may correct the imbalance.

Depending on the exact cause of the hyponatremia, treatments may include administering a saline solution through an IV, temporarily restricting water intake, and/or providing medications to relieve the symptoms.

Expectations/Prognosis

The outcome depends on the condition that is causing the problem. Acute hyponatremia, which develops in under 48 hours, is usually more dangerous than hyponatremia that develops slowly over a period of days or weeks (chronic hyponatremia).



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