

Overcompensation for Low Sodium Leads to Severe Injury

A 42-year-old woman presented to her family physician in late December 2003 with flu-like symptoms and received a diagnosis of sinusitis. Two days later, she went to a hospital, where sinusitis was confirmed. She was given a prescription for Tylenol with codeine and discharged for follow-up with her family physician.

Later that evening, she fell out of bed at home. Her condition worsened, and an ambulance was called. An initial work-up in the emergency department showed a critically low sodium level of 99 mEq/L. Her case was assigned to Nurse R. and critical care physician Dr. M. An order was given for 100 cm³ of hypertonic saline, to be administered over six hours.

The patient's condition improved for a while, but then she awoke from a nap unable to speak and with quadriparesis. She eventually became comatose. She was transferred to another hospital, where she received a diagnosis of osmotic demyelination syndrome due to the over-rapid correction of her sodium.

The patient has required cognitive, physical, occupational, and speech therapies and is cared for in a hospital or at a supported living facility. She uses mostly single words, hand gestures, and facial expressions for communication.

The plaintiff claimed that Nurse R. failed to follow the order for the saline, giving it over the course of one hour, that Dr. M. failed to diagnose chronic hyponatremia, and that her sodium level was raised too fast.

The defendant claimed that the plaintiff had acute hyponatremia due to encephalitis. The plaintiff countered that lumbar punctures, laboratory testing, and a brain biopsy were not diagnostic of encephalitis. The defendant also claimed that the plaintiff's brain injury had already occurred when she arrived at the hospital.

Outcome

Dr. M. was found 60% at fault and Nurse R. was found 40% at fault, with the jury awarding \$33,745,000. This included \$5,350,000 to the plaintiff's husband for lost

earnings and loss of services. The hospital was apparently liable for the damages as employer. A post-trial motion was pending.

Comment

See below.

Epinephrine Given Intravenously Instead of Subcutaneously

A 20-year-old woman went to a hospital emergency department with an allergic reaction to Tylenol-3. She was given 0.3 mg of epinephrine, but the nurse administering the dosage mistakenly gave it intravenously rather than subcutaneously, as ordered. The hospital immediately recognized and acknowledged the error.

A few hours later, the plaintiff developed mild pulmonary edema and was admitted for observation. During her four-day admission, extensive work-up was conducted to evaluate her increasing complaints following the incident.

The plaintiff claimed that the epinephrine caused a heart attack and reduction of oxygen to her brain, which caused hypoxic brain injury. The plaintiff also claimed that immediately after the epinephrine was injected, she experienced a severe contraction of her entire neck and back, which caused a thoracic outlet syndrome that resulted in constant and severe pain. The plaintiff claimed that the brain injury and chronic pain would prevent her from ever completing a college degree or working and that it impaired her judgment, which led to poor decisions.

The defendant denied that a heart attack occurred or that any hypoxic brain injury or thoracic outlet problems were related to the incident. The defendant argued that troponin and creatine kinase levels were never in the range of myocardial infarction and had returned to normal within 48 hours of the incident. The defendant also maintained that ECGs showed only a temporary reduction in her ejection fraction and that cardiac function was normal at the time of discharge. The defendant claimed that the epinephrine actually increased blood flow to the brain and that multiple brain studies were negative and ruled out any hypoxic

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brain injury. The defendant also claimed that medical records showed that the plaintiff had complained of neck and back problems for five years prior to the incident. The defendant also claimed that the plaintiff had an extensive preexisting history of treatment for severe anxiety and depression, which had caused disabling pain complaints and which required treatment with narcotics, antidepressants, and anti-anxiety medications.

Outcome

A defense verdict was returned.

Comment

An increasing number of malpractice claims are being brought based on incorrect concentrations, routes, and rates of administration of intravenous medications and fluids. In each of the two cases above, a nurse administered fluid or medication too rapidly or by the wrong route. Though it is impossible to eliminate all human

error, a few simple rules might help avoid this type of serious and sometimes fatal error, along with the malpractice claims that will inevitably follow.

Both the physician who writes an order for IV medication or fluid, and the nurse who carries it out, should ask themselves the following questions: "Is this a medication or fluid dose, route, and rate that I am familiar with?" and "Is this a dangerous medication (such as IV colchicine) or fluid?" If the answer to the first question is "no," and/or to the second "yes," a co-worker such as a nurse, physician, or pharmacist should be asked to review the order and to monitor its administration, whenever possible. Also, the emergency physician who orders a parenteral medication or fluid with a narrow therapeutic index should remain involved until the order is picked up and completed. **NF**

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