Question of the Week #24
Fluid/electrolyte imbalance

You have been assigned to care for Mr. L, who is scheduled for a Transurethral Resection of the Prostate (TURP) under spinal anesthetic. When you conduct your preoperative interview, you find a friendly, gregarious man surrounded by family and friends. He is very interested in everything he sees in the OR, and demands detailed explanations of the pulse oximeter probe, the anesthesia machine, and the tower with the TV monitor, light source, etc.
The case begins without any trouble, and Mr. L. continues to ask questions. However, as the case progresses Mr. L. complains of a headache, and then nausea. He appears disoriented and asks the same question over and over. You notice that his heart rate and blood pressure have increased, and that the QRS complex on his EKG has widened.
What is happening with Mr. L.? What should you do?

Response
Jeanne pretty much did my work for me. TURP syndrome, more accurately defined as symptomatic dilutional hyponatremia from fluid overload, results from an excessive amount of fluid intravasated, or absorbed, into the bloodstream from irrigation fluids used to dilate the bladder and clear the field of blood and debris.

Typically the fluids of choice for visualization of the field in urologic procedures are glycine, mannitol, and sorbitol. These are non-electrolyte or “electrolyte poor” solutions that are nonconductive and therefore do not dissipate electrical monopolar current as normal saline does. The downside to their use is that, as they jockey for equilibrium with other electrolytes in the bloodstream, they decrease the serum osmolality (concentration of parts in solution) of sodium. If sodium falls below 135 mEq/L, signs and symptoms of hyponatremia will appear.

Cells in a hypotonic environment swell; brain cells are especially sensitive to this, as they are limited in the amount of room to accommodate increased volume. This is why so many of the signs and symptoms of hyponatremia are neurologic in origin.

Although the exact amount of fluid required to initiate TURP syndrome is unknown, signs and symptoms of fluid overload have been exhibited with absorption of one to two liters of glycine (Denholm, 2010). The risk increases related to the length of surgery and the amount of pressure applied to the distention fluid. Using bipolar electrosurgery or laser vaporization, which allows for the use of normal saline as the irrigating fluid, has been found to decrease the incidence of TURP syndrome (Falahatkar, et al, 2010; Issa et al, 2004).

Nursing considerations for caring for Mr. L. include:
- Monitor the amount of irrigation recovered vs. the amount used to determine the volume deficit.
- Document baseline assessment and intraoperative events.
• Report the first sign of any complication to the surgeon and anesthesia care provider.
• Assist anesthesia care provider (draw blood for chem panel, provide diuretic and/or hypertonic saline as needed)
• Provide patient safety measures if condition worsens (e.g. seizure/fall precautions)
• Report pertinent information during hand-offs to other care providers
• Plan care so that OR time is used efficiently. It is recommended that resection time be limited to one hour if hypotonic fluids are used (Denholm, 2010; Issa, et al, 2004)

Understanding fluid and electrolyte balance is incredibly useful as it plays a huge role in patient responses. Imbalances are frequently overlooked or not diagnosed, especially in our elderly population. Instead of only assuring that the lab work is “on the chart”, take a good look at what those values are. They provide valuable clues to your patient’s current health status and may help you anticipate and prevent potential complications. An accurate method of calculating fluid volume deficits should be incorporated into all procedures.

References:


