Study links hyponatremia with increased risk of death, complications following surgery

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An observational study of nearly 1 million patients who underwent surgery suggests that preoperative hyponatremia (an electrolyte disorder in which sodium levels in the blood are low) was associated with an increased risk of complications and death within 30 days of surgery, according to a report published Online First by *Archives of Internal Medicine*.

Hyponatremia has been linked to increased morbidity and mortality in a variety of medical conditions but its association with perioperative (around the time of surgery) outcomes is uncertain, according to the study background.

Alexander A. Leung, M.D., of Brigham and Women's Hospital, Boston, and colleagues conducted a study using the American College of Surgeons National Surgical Quality Improvement Program database to identify 964,263 adults who underwent major surgery at more than 200 hospitals from 2005 through 2010. Preoperative hyponatremia (defined as sodium level

"We found that preoperative hyponatremia was present in approximately 1 in 13 patients, and this group had a 44 percent increased risk of 30-day perioperative mortality, even after adjustment for all other potential risk factors," the authors note. "Preoperative hyponatremia was also associated with an increased risk of perioperative major coronary events, surgical site wound infections, pneumonia and prolonged hospital stays."

Preoperative hyponatremia was associated with a higher risk of 30-day mortality (5.2 percent vs. 1.3 percent). Hyponatremia also was associated with a greater risk of perioperative major coronary events (1.8 percent vs. 0.7 percent), wound infections (7.4 percent vs. 4.6 percent), pneumonia (3.7 percent vs. 1.5 percent), and prolonged median lengths of stay by about a day, according to the study results.

"Although this study provides evidence that preoperative hyponatremia is associated with perioperative morbidity and mortality, further research is needed to establish whether correcting preoperative hyponatremia will mitigate risks," the authors comment. "Legitimate concern should be raised about the safety of intervention as overly rapid or large changes to sodium levels over a short time can be potentially disastrous. Conversely, if monitored correction of hyponatremia is found to be safe and beneficial, it would strengthen causal inference and would be transformative to routine care since serum sodium is not presently recognized as an independent and reversible risk factor for perioperative complications."

In a commentary, Joseph A. Vassalotti, M.D., and Erin DuPree, M.D., Mount Sinai Medical Center, New York, write: "Hyponatremia is familiar to physicians as the most common electrolyte disorder, occurring in up to 15 percent to 30 percent of hospitalized patients."

"Is there anything treating physicians can do to reduce the operative risk associated with hyponatremia? First, although routine assessment of serum sodium levels preoperatively is not recommended, 79 percent of patients had preoperative serum sodium testing in this study. Obviously, the first question should be whether serum sodium levels should be tested," they continue.

"The preoperative evaluation should strive to determine whether the patient is in optimal health and whether the individual's condition could

be improved before surgery. Previous hyponatremia and conditions commonly associated with hyponatremia are reasonable indications to perform serum sodium assessment in a subpopulation of preoperative patients," they conclude.

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