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Vitamin D Levels, Hospital Infections Linked

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Preoperative vitamin D blood levels were significantly and inversely associated with risk for hospital-acquired infections after gastric bypass surgery, researchers found.

Among obese patients with 25-hydroxyvitamin D levels lower than 30 ng/mL, there was a three-fold risk for a hospital-acquired infection after surgery versus patients whose vitamin D levels were 30 ng/mL or higher (adjusted odds ratio 3.05, 95% CI 1.34-6.94, according to [Sadeq Quraishi, MD](#), of Massachusetts General Hospital (MGH) in Boston, and colleagues.

This association did not "materially change" when adjusted for perioperative factors, they wrote online in *JAMA Surgery*.

Low serum vitamin D has been [tied to risk of hip osteoarthritis](#) in older men and [increased odds of heart failure](#) versus those with normal serum levels, while elevated concentrations have been associated with [decreased risk for ear infection in children](#).

However, these associations have not supported vitamin D supplementation in most patients. The [U.S. Preventive Services Task Force](#) and the [Institute of Medicine](#) have each said that such supplementation is unnecessary.

The authors noted that vitamin D insufficiency "may be as high as 70% to 80% in bariatric surgery patients," while rates of surgical site infections are as high as 10% among Roux-en-Y gastric bypass surgery patients in laparoscopic procedures and as high as 25% among open abdominal surgery.

They studied the association between [hospital-acquired infections](#) and vitamin D serum

concentration in a population of 770 Roux-en-Y gastric bypass surgery patients treated at MGH.

Patient data was gathered through the hospital's research patient data registry.

Vitamin D concentrations "are routinely measured in individuals scheduled to undergo Roux-en-Y gastric bypass surgery" at the site during a preoperative nutrition assessment, the authors stated.

Hospital-acquired infections included surgical site infection, catheter-related urinary tract infection, pneumonia, and bacteremia more than 48 hours after hospital admission and within 30 days of surgery.

Outcomes were adjusted for age, sex, race, body mass index, physical status, medical comorbidities, date of admission, type of surgery, use of neuraxial anesthesia, timely administration of prophylactic antibiotics, duration of general anesthesia, intraoperative fluid balance, intraoperative temperature nadir, intraoperative fraction of inspired oxygen concentration, perioperative blood transfusions, preoperative levels of nutritional markers, and preoperative daily vitamin D supplementation.

Comorbidities included hypertension, diabetes, obstructive sleep apnea, and chronic obstructive pulmonary disease. Nutritional markers included hemoglobin A1c, iron, ferritin, hemoglobin, albumin, thiamine, parathyroid hormone, and calcium.

The overall rate of hospital-acquired infection was 5.3%, the rate of surgical site infection was 2.6%, and the overall prevalence of low vitamin D in the cohort was 58%.

There were no substantial baseline differences between patients with hospital-acquired infections and those without infection, other than vitamin D concentration and a higher rate of open Roux-en-Y gastric bypass procedures among those who developed an infection.

Patients with low vitamin D also had a greater than four-fold increased risk for surgical site infection (aOR 4.14, 95% CI 1.16-14.83). Although associations were very slightly attenuated through a sensitivity analysis, odds of hospital-acquired infection were still three-fold, while odds of a surgical site infection were 3.93-fold. This changed to 2.91-fold odds (95% CI 1.25-6.76) and 4.32-fold odds (95% CI 1.16-16.17), respectively, in a fully-adjusted multivariable logistic regression analysis.

The authors noted the study was limited by a lower baseline risk for surgical site infection, lower-than-average prevalence of hospital acquired infections, a population limited to obese adults undergoing gastric bypass surgery versus a random sample, and lack of association between procedure and other nosocomial infections. Additionally, the

lack of association between procedure and other nosocomial infections. Additionally, the analysis was done at a single center and was conducted retrospectively.

They concluded that "these results suggest that preoperative [vitamin D] levels may be a modifiable risk factor for postoperative nosocomial infections. Prospective studies must determine whether there is a potential benefit to preoperative optimization of vitamin D status."

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No other conflicts of interest were reported.

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