High blood sugar, obesity increase risk for surgical site infection

25 July 2012

Two recent studies in the July issues of the *Journal of Bone and Joint Surgery* (JBJS) looked at surgical site infections and hyperglycemia, the technical term for high blood glucose, or high blood sugar. According to the first study "Relationship of Hyperglycemia and Surgical-Site Infection in Orthopaedic Surgery," high blood sugar is a concern during the post-traumatic and post-operative period and it may help to preoperatively identify a population of patients with musculoskeletal injuries who are at significant risk for infectious complications.

Nearly, one-third of patients who are admitted to the hospital without a history of diabetes have hyperglycemia, which is associated with a longer hospital stay, higher rates of admission to the intensive care unit (ICU), and increased mortality.

Study authors reviewed data on patients 18 years or older who had isolated orthopaedic injuries requiring acute operative intervention. Patients diagnosed with diabetes or who were in the ICU were not included in the study.

Of 790 patients, there were 268 open fractures (if the bone breaks in such a way that bone fragments stick out through the skin, or a wound penetrates down to the broken bone), and 21 surgical-site infections (SSIs) at 30-day follow-up. Age, race, comorbidities, injury severity, and blood transfusion were not associated with SSI at 30 days.

Specific study details: SSIs developed in 13 of 294 patients (4.4 percent) who had more than one glucose value greater than or equal to 200 mg/dL and 8 of 496 patients (1.6 percent) without more than one glucose value greater than or equal to 200 mg/dL. The authors concluded that hyperglycemia was an independent risk factor for thirty-day SSI in orthopaedic trauma patients without a history of diabetes.

This study suggests that recognition of the relationship between hyperglycemia and infectious complications may substantially influence post-operative care of orthopaedic patients. Large, prospective, randomized studies are necessary to further delineate this relationship.

A second study featured in the July 18 issue of JBJS, found that diabetes and morbid obesity increased the risk of infection following hip and knee replacement. Authors of "Obesity, Diabetes, and Preoperative Hyperglycemia as Predictors of Periprosthetic Joint Infection" analyzed 7,181 hip and knee replacements and found that 52 post-operative joint infections occurred within the first year, and that the infection rate increased from a .37 percent in patients with a normal body index to 4.66 percent in the morbidly obese group. Normal BMI was defined as a body mass index (BMI) of less than 25, while morbid obesity was defined as more than 40. (BMI is a calculation that is determined using height and weight).

Diabetes more than doubled the risk of a post-operative joint infection independent of obesity. The infection rate was the highest in morbidly obese, diabetic patients.

For patients without a diagnosis of diabetes at the time of surgery, there was a trend toward a higher infection rate in association with a pre-operative glucose level of more than 124 mg/dL.

The authors suggest that identifying and/or treating hyperglycemic patients preoperatively, especially if they are obese, would help patients achieve a better outcome by avoiding complications caused by infection. In addition, identifying patients with undiagnosed diabetes would be important for their overall long-term prognosis. Authors further conclude that the benefits of joint replacement should be carefully weighed against the incidence of postoperative infection, especially among the morbidly obese patients.

Provided by American Academy of Orthopaedic Surgeons