

HbA_{1c} Predicts Post-Arthroplasty Risks

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SAN FRANCISCO — Complications after total knee or hip arthroplasty in patients with diabetes were significantly more common in those with higher hemoglobin A_{1c} levels, a retrospective study of 119 patients found.

The overall rate of medical and surgical complications was more than 50% in patients with a hemoglobin A_{1c} (HbA_{1c}) level greater than 7%, and less than 40% in those with an HbA_{1c} level below 7%, study investigators reported.

"We believe that the HbA_{1c} test should be a routine preoperative test ordered for diabetes patients prior to total joint arthroplasty," Dr. Yossef C. Blum said during a poster session at the annual meeting of the American Academy of Orthopaedic Surgeons. "Patients with significantly elevated HbA_{1c} levels should have their glycemic control optimized prior to undergoing total hip arthroplasty or total knee arthroplasty, as well as in the perioperative period."

In a review of inpatient and

outpatient charts of total knee or hip arthroplasty performed by a single surgeon at one institution from 2000 to 2007, Dr. Blum and his associates found 199 patients whose HbA_{1c} level had been measured in the year before surgery or within 3 months after the surgery. Patients were excluded from the study if they had conditions other than diabetes that led to an immunosuppressed state, such as HIV or rheumatoid arthritis.

Patients did not have to have a diagnosis of diabetes to be included in the study—just an HbA_{1c} measurement—because up to a third of people with diabetes do not have a formal diagnosis, he and his associates reported.

In all, 73% of the patients underwent total knee arthroplasty and 27% had total hip arthroplasty.

Patients had a mean age of 68 years. The cohort was 76% male, 34% white, 34% black, 23% Hispanic, and 9% other races/ethnicities. Their mean body mass index was 34 kg/m², and their mean HbA_{1c} level was 6.6% (range 4.9%-12.3%).

The investigators performed

a multivariate analysis looking for associations between HbA_{1c} levels and outcomes within 3 months of the surgery, said Dr. Blum of Montefiore Medical Center, New York.

Higher HbA_{1c} levels were significantly associated with an increased risk for any complications, surgical site complications, and wound complications after total knee or hip arthroplasty, Dr. Blum and his associates reported.

Only four surgical site infections occurred—too few to demonstrate a specific association between HbA_{1c} levels and wound infection—but "it is notable that three of four infections occurred in patients with an HbA_{1c} [level] above 7.5%," he said.

The current study found no association between HbA_{1c} level and the risk of non-surgical-site infections, urinary retention, or discharge after surgery to an inpatient facility.

Overall, 43% of the patients developed medical or surgical complications.

"Future studies with increased numbers of patients may help determine a cutoff HbA_{1c} level above which total

hip arthroplasty or total knee arthroplasty can be considered too high risk," Dr. Blum said.

Recommendations from the American Diabetes Association set a treatment goal of an HbA_{1c} level below 7%.

A 2003 review by other investigators of 290 diabetes patients who underwent noncardiac surgeries found that those with an HbA_{1c} level above 7% had a statistically significant increased risk for postoperative complications, Dr. Blum said.

There have been few studies in the past 2 decades on the results of total knee arthroplasty in diabetes patients, and even fewer studies on the results of total hip arthroplasty in diabetes patients, Dr. Blum noted. Some reports suggest a risk of 1%-7% for deep infection, and overall wound complication rates of 1%-12%.

Diabetes patients may be more prone to perioperative urinary tract infection, pneumonia, sepsis, cardiac problems, and postoperative neuropathy.

Studies suggest diabetes patients are more likely than nondiabetics to be discharged to an inpatient facility after total knee arthroplasty. ■

Insulin May Avert Postop Atrial Fib

SAN FRANCISCO — Giving intraoperative insulin to cardiac surgery patients was associated with a small but significant reduction in the risk of postoperative new-onset atrial fibrillation, Dr. Michel R. Rheault said at the annual meeting of the American Society of Anesthesiologists.

The retrospective study of 9,399 patients analyzed data on all adults undergoing coronary bypass grafting or valvular procedures between January 2002 and September 2006 at the Cleveland Clinic. Of those, 5,924 had received intraoperative insulin and the rest did not. Postoperative atrial fibrillation developed in 37% of the insulin group and in 38% of the control group, reported Dr. Rheault and his associates at the clinic.

After adjusting for 44 confounding variables related to comorbid conditions, preoperative medications, operative procedures, perioperative factors, and laboratory variables, intraoperative insulin was associated with a 14% reduced risk for atrial fibrillation.

New-onset atrial fibrillation is common after cardiac surgery. Recent evidence suggesting that the inflammatory response to cardiac surgery contributes to the development of postoperative atrial fibrillation has led some surgeons to give insulin intraoperatively for its anti-inflammatory and cardioprotective effects, said Dr. Rheault.

Other changes in risk patterns were also found in the retrospective study. Patients who previously had cardiac surgery were 28% less likely to develop postoperative atrial fibrillation, whereas those undergoing a left internal thoracic artery graft had a 21% reduced risk for atrial fibrillation after surgery, compared with those undergoing other cardiac procedures.

The risk increased by 149% in patients with a history of atrial fibrillation, by 66% with every extra 10 years of age, by 28% in patients with stroke, and by 23% in patients with either cardiogenic shock or chronic obstructive pulmonary disease. The risk of postoperative atrial fibrillation was 22% higher in patients who took β -blockers preoperatively, 19% higher in males than in females, 17% higher in patients with a history of heart failure, and 12% higher with every 5% increase in the baseline hematocrit.

The risk for postoperative atrial fibrillation was found to be 113% higher in those undergoing mitral valve replacement, 32% higher in tricuspid valvuloplasty patients, and 17% higher in those having aortic valve replacement, compared with other cardiac procedures.

The risk of postoperative atrial fibrillation increased by 27% with every unit of red blood cells transfused and by 3% with every 10-minute increase in total cross-clamp time. ■

Risks Greater for Type 1 Than for Type 2 Diabetes

SAN FRANCISCO — Patients with type 1 diabetes were more likely than those with type 2 diabetes to die or develop perioperative complications after undergoing total knee or hip arthroplasty, a review of 65,769 cases found.

A bivariate analysis that directly compared complications in the two diabetes groups without adjusting for confounders showed that 0.7% with type 1 diabetes and 0.3% with type 2 diabetes died in association with the total joint replacement surgery, Dr. Michael P. Bolognesi and his associates reported in a poster presentation at the annual meeting of the American Academy of Orthopaedic Surgeons.

The risk of death related to total joint arthroplasty in type 2 diabetes patients was 56% lower than that in type 1 diabetes patients.

The investigators used federal data from the 2003 National Inpatient Sample to compare the rates of complications between 8,728 patients who had type 1 diabetes and 57,041 patients who had type 2 diabetes and underwent primary and revision arthroplasties of the hip or knee from 1998 to 2003.

Their analysis was based on regression modeling to control for the potential con-

founding effects of age, race, gender, and median household income by zip code.

Type 2 diabetes patients were about 30% less likely than type 1 diabetes patients to develop a urinary tract infection, pneumonia, or postoperative hemorrhage; they were about 50% less likely to develop an infection related to the surgery, said Dr. Bolognesi of Duke University, Durham, N.C.

'Type 2 diabetes patients were about 30% less likely than type 1 patients to develop a urinary tract infection, pneumonia, or postoperative hemorrhage.'

Each of the differences they found between groups was statistically significant.

Perioperative urinary infections occurred in 5% of patients with type 1 diabetes and in 3% with type 2 diabetes. Pneumonia developed in 0.8% of the type 1 diabetes group and in 0.5% of the type 2 diabetes group.

Postoperative hemorrhage after total knee or hip arthroplasty was seen in 2% of the type 1 diabetes group and in 1% of the type 2 diabetes group.

Infection occurred in 0.8% of patients with type 1 diabetes and in 0.4% with type 2 diabetes.

The mean length of stay in the hospital after total joint arthroplasty was 6 days in the type 1 diabetes group at a mean inflation-adjusted cost of \$33,000, and 5 days in the type 2 diabetes group at a mean inflation-adjusted cost of \$31,000.