Objective:

Total hip and knee replacement surgery are one of the most frequent major surgeries performed in USA. In 2002, the number of primary hip and knee arthroplasty was 119,300 and 381,000, respectively. By year 2030 the number is projected to increase to 572,000 and 3,481,000, respectively (2).

Deep wound infection after major orthopaedic surgery is one of the most serious complications causing increase in morbidity and mortality and health care costs (3). Various risk factors for developing infection after hip and knee replacement surgery were described including age, ASA PS status, obesity, smokers' comorbidities and surgical technique factors (4,5,6,7).

Perioperative hyperglycemia may increase the risk for infection after the surgery (8) but it is unknown if increases the risk after major orthopaedic surgery. We investigated whether high blood glucose increases a risk for perioperative joint infection (PJI) after total hip and knee arthroplasty.

Methods:

After obtaining IRB approval, we reviewed our computerized database for primary total hip and knee arthroplasty from 2000 to 2008. Demographic information, past medical history of patients, perioperative biochemistry and postoperative complications were reviewed.

Perioperative joint (deep wound) infection was defined as a deep infection below fascia, involving the muscle and/or bone. The diagnosis of deep perioperative infection was made if at least three of the following risk factors were present: (1) abnormal serum lysozyme/leukocyte sedimentation rate 30 min, (2) a positive joint culture (3) clinical or radiographic signs of perioperative infection such as persistent elevation, focal osteolysis, hip joint swelling, draining sinus, (4) clinical signs of purulence during the subsequent surgical intervention; and (5) a positive intraoperative culture. The minimum follow-up was 12 months (mean: 43 months, range: 12–76 months).

PJI patients were stratified by history of diabetes (yes vs no), male sex (yes vs no), higher ASA PS (2.68 vs 2.45, P<0.001), had history of (h/o) MI (7.9 vs 4.3%, P=0.029), h/o renal disease (4.2 vs 1.9%, P=0.007), higher mean INR (1.36 vs 1.32, P=0.009), and higher BUN (14.7 vs 17.9 mg/dL, P=0.001).

Results:

Data from 17600 patients were included in the study. The incidence of perioperative joint (deep wound) infection in 1.86% (95% CI: 0.91, 1.21).

Variables were tested using the t-test. Categorical variables were tested using Fisher’s exact test. P values reported are two-sided.

Conclusions:

We confirmed the known risk factors for PJI after total hip and knee arthroplasty: male sex, BMI, ASA PS, h/o MI, h/o renal disease, h/o DM, longer duration of surgery and knee arthroplasty. Higher mean perioperative blood glucose is a significant risk factor for PJI after total hip and knee arthroplasty. Other significant metabolic risk factors were higher preparative and mean postoperative creatinine, postoperative rise in creatinine, lower mean albumin and higher mean INR and BUN.

The importance of this study is that the prevalence of PJI is believed to be on the rise once again and the diagnosis of PJI continues to be challenging. Knowing the risk factors associated with PJI could help physicians to identify patients who may need more aggressive prophylaxis and postoperative infection surveillance.

A prospective, randomised, controlled trial is required to determine whether optimizing blood glucose peroperatively would decrease the incidence of deep wound infection in this clinical setting.

References:


