

The impact of surgical site infection (SSI) on mortality in elderly patients following orthopedic surgery

Jeanne Lee, Kenneth E. Schmader, Richard Sloane, Keith S. Kaye.

Background: Orthopedic SSI adversely affects health outcomes in elderly patients (>64 years of age). However few studies have examined mortality attributable to SSI in the elderly orthopedic surgery population.

Objective: To quantify the strength of association between SSI and mortality in elderly patients following orthopedic surgery during the one-year postoperative period.

Methods: A matched outcomes study was conducted in 8 institutions between 6/1991 and 7/2002, Duke University Medical Center and 7 community hospitals from the Duke Infection Control Outreach Network (DICON). Cases were identified prospectively and were defined as elderly patients who developed SSI following orthopedic surgery, and controls were elderly orthopedic surgery patients who did not develop SSI. Controls were frequency matched to cases by procedure type and year, and hospital.

Study variables included demographics, comorbid conditions, functional status and perioperative factors. The outcome of interest was one-year postoperative mortality which was ascertained through the United States Social Security Death Index. Data were collected retrospectively from infection control databases and patient charts.

Multivariable analysis was performed using logistic regression.

Results: 169 SSI cases were identified and 171 controls were selected. The mean age of study patients was 74.7 years, 66% were female and 83% were Caucasian. The most frequent procedures were hip arthroplasty (n=74, 21.8%), fracture repair (n=55, 16.2%), and knee arthroplasty (n=40, 11.8%). The most common SSI pathogen was *Staphylococcus aureus* (n=95, 56.1% of SSI cases) and greater than half were methicillin-resistant (n=52, 54.7% of *S. aureus* SSI). In bivariate analysis, SSI was associated with increased risk for one-year postoperative mortality (OR 4.65, 95% confidence interval [CI] 1.97, 10.98; p<0.001). In multivariable analysis, SSI remained an independent predictor for mortality (OR 3.94, 95% CI 1.55, 9.98; p=0.004). Additional predictors of mortality were an inability to bathe independently during the preoperative period (OR 3.57, 95% CI 1.52, 8.35; p=0.003) and an American Society of Anesthesiologists (ASA) score of ≥ 3 (OR 5.83, 95% CI 1.67, 20.30; p=0.006).

Conclusion: SSI in the elderly orthopedic surgery population almost quadrupled the risk for postoperative mortality, which is similar to the impact of SSI on mortality in the general surgical population. Interestingly, requiring assistance with bathing in the preoperative setting more than tripled the risk for mortality. The association between functional status and post-operative mortality warrants further investigation.