Screening for and Treating Intranasal Staphylococcus Carriage Correlates with Reduced Surgical Site Infections Complicating Operative Fracture Repair

Abigail Cortez, BA[1]*; James Burns, MS*[2]*; Moses Lee, BA; Mariya Samoylova, BS; Eleni Berhaneselase, BA; Pouriya Ghayoumi, MD; Alexander A. Theologis, MD; Saam Morshed, MD, PhD*
[1]*University of California, San Francisco School of Medicine, California, USA*
[2]*Georgetown University School of Medicine, Washington, District of Columbia, USA*

Purpose: Preoperative intranasal mupirocin has been shown to decrease postoperative *Staphylococcus aureus* infections in colonized elective orthopaedic surgery patients, but this effect has not been investigated in orthopaedic trauma patients. We evaluate the association of a nasal *S. aureus* screening and treatment protocol with surgical site infection incidence among orthopaedic trauma patients undergoing operative treatment of acute fractures.

Methods: We conducted a retrospective cohort study including adult patients who sustained an acute pelvic or extremity fracture undergoing operative repair at a single university-affiliated Level I trauma center between 2012 and 2015. During this period all patients were screened for nasal *S. aureus* and those with positive cultures or those whose results were pending at time of surgery were treated with intranasal 2% mupirocin ointment for 5 days. Patients with at least 90 days of follow-up were matched one-to-one with historical controls presenting prior to the screening program based on fracture location (OTA fracture class) and fracture type (open or closed). The primary outcome was surgical site infection defined as infection requiring readmission and reoperation within 90 days of initial surgery.

Results: 268 screened patients treated definitively for an acute pelvic or extremity fracture were included and matched to 268 control subjects. 26 (10%) had positive *S. aureus* nasal swab and were treated. In the screened group, 14 patients (5%) developed surgical site infections requiring readmission and reoperation within 90 days, compared to 24 (9%) in the control group ($P = 0.092$). Current smoking and diabetes were associated with infection and adjusted for in a multivariable analysis showing that nasal *S. aureus* screening was associated with 0.34 (95% confidence interval 0.13-0.88) the odds of infection, $P = 0.027$.

Conclusion: Implementation of a screening and treatment protocol for intranasal *S. aureus* was associated with a reduction in surgical site infection requiring reoperation after operative pelvis and extremity fracture repair. A larger prospective clinical trial is required to confirm the effectiveness of this program in reducing surgical site infections in an orthopaedic trauma population.

See pages 401 - 442 for financial disclosure information.