Nasal Decolonization with Povidone-Iodine Decreases Surgical Site Infection in the Elderly with Intracapsular Femur Fractures

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Purpose: We undertook to assess the efficacy of povidone-iodine nasal decolonization to prevent surgical site infection (SSI) by Staphylococcus aureus (SA) in elderly patients with displaced intracapsular femur fractures (OTA 31-B) initially admitted through the Emergency Department (ED).

Methods: After IRB approval, 267 patients undergoing hip replacement (total or hemiarthroplasty) for a displaced femoral neck fracture between January 2012 and December 2015 were retrospectively reviewed. Patients were treated in two different hospitals with two different protocols for SSI prophylaxis. All patients in the study were screened preoperatively for methicillin-resistant S. aureus (MRSA) through a nasal swab test performed by a trained nursing team in the ED. MRSA-carriers in Hospital A (Group A) received preoperatively prophylaxis with vancomycin 1-2 g IV (depending on body mass index [BMI]), whereas MRSA carriers in Hospital B (Group B) received povidone-iodine nasal swab (3M-NSP) with the standard dose of cefazolin 1-2 g IV. Patients were excluded if younger than 60 years old, follow-up (FU) <3 months, pathologic fractures, periprosthetic fractures, and revision arthroplasty. Data analysis included demographics, preoperative risk factors for infection (diabetes mellitus [DM], BMI>35, immunosuppressive states, tobacco, ASA [American Society for Anesthesiologists]>3, anemia, dementia, anticoagulation medication, non-Hispanic race, surgical time), MRSA carrier status, SSI prophylaxis regimen, and development of SSI (superficial/deep). Fisher's exact test was used for statistical analysis.

Results: 231 patients met the inclusion criteria. Group A had 96 patients with a mean age of 79 years (range, 60-95), with 64% of females. Group B included 135 patients with an average of 79 years (range, 60-97), with 57% being females. There were no differences between groups for demographics, preoperative risk factors, and implant selection (Group A: 70% hemiarthroplasty/30% total hip replacement vs Group B: 75% hemiarthroplasty/25% total hip replacement, P = 0.37). 19 patients (16%) in Group A were found to be MRSA carriers for 21 patients (15%) in Group B (P = 0.48). Nine patients (9.3%) in Group A developed an SSI whereas one patient (0.7%) in Group B was noted to have an SSI (P = 0.001; ß = 0.86). Four SSIs (44%) in Group A had positive cultures for S. aureus (2MRSA/2MSSA [methicillin-sensitive S. aureus), with two being MRSA carriers. The only SSI in Group B did not have positive cultures for S. aureus (P = 0.02). Eight of the 9 SSIs in Group A were deep tissue infections requiring irrigation and debridement. The SSI in Group B was deemed superficial and was successfully treated with a course of antibiotics.

Conclusion: Nasal decolonization with povidone-iodine appears to be a more effective infection prophylactic agent than vancomycin when treating femoral neck fractures in the

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elderly. Moreover, povidone-iodine may not only reduce the risks of additional surgery and financial burden with longer hospitalization, but could potentially prevent S. aureus strains to become resistant to vancomycin.