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Advisor(s): Aditya Maheshwari

Does Skin Preparation Choice Impact Surgical Site Infection Rates in Mild-to-Moderate and Severely Obese Patients Undergoing Total Joint Arthroplasty?

Introduction: Optimal preoperative skin preparation in total joint arthroplasty (TJA) remains debatable between chlorhexidine gluconate (CHG) and iodine-containing solutions for surgical site infection (SSI) prevention. Obesity is an independent risk factor for SSI following TJA. Thus, we investigated the incidence of SSI following the use of 3 different skin preps in non-obese, as well as mild-to-moderately and severely obese patients.

Methods: From our institutional database, we identified 1,233 adult patients who underwent primary TKA or THA for degenerative joint disease or avascular necrosis from 2012 to 2019. Patients were grouped by BMI: Non-Obese (<30 kg/m²), Mild-to-Moderate Obese (30 to <40 kg/m²) and Severely Obese (≥ 40 kg/m²). They were then grouped by the skin preparation used: povidone-iodine (PVD), CHG, and both PVD/CHG. BMI cohorts were compared for demographics, perioperative parameters, and 90-day outcomes across prep solutions. Multivariate binary logistic regression was performed to identify independent associations between prep choice and 90-day complications.

Results: Non-Obese patients had lower PVD rates (33.3%) vs. CHG and PVD/CHG (48.5%, 43.4%, $p < 0.05$), while Severe Obese patients had higher PVD rates (20.0%) vs. CHG and PVD/CHG (10.7%, 12.0%, $p < 0.05$). There was a difference in sex distribution between the PVD, CHG, and PVD/CHG groups (male: 28.1% vs. 37.9% vs. 93.6% and female: 71.9% vs. 62.1% vs. 6.4%; $p < 0.001$). In each BMI cohort, the total SSI rate was not affected by prep solution choice ($p > 0.05$). Similarly, no difference was detected when comparing the infection risk or SSI between BMI cohorts for each prep solution ($p > 0.05$).

Discussion: This study may inform a surgeon's choice of prep solution when operating on patients with increasing levels of obesity. It may pave the way toward a different skin preparation to ensure better surgical outcomes in this patient population.