Local Antibiotic Powder Application Reduces Postoperative Infection in Orthopaedic Trauma Surgery

***Alla Balabanova BA**; Xiangquan Chu MD; Lori R Chambers MD; Cyril Mauffrey MD; Joshua A Parry MD*
Denver Health Medical Center, Denver, CO, United States

Purpose: Placement of local antibiotic powder into surgical wounds in orthopaedic trauma surgery is prevalent; however, evidence for its use is lacking. The purpose of this study was to determine if this practice affects postoperative infections and acute kidney injuries.

Methods: A retrospective review of 2252 orthopaedic trauma surgeries identified 1437 patients who underwent open surgeries with a minimum of 6-month follow-up. Local antibiotic powder was used in 397 patients (28%), with 114 (29%) receiving vancomycin alone and 282 (71%) receiving vancomycin and tobramycin. Median vancomycin and tobramycin dose was 1.5 g (interquartile range 1, 2) and 1.2 (0, 1.2) g, respectively. Local antibiotic powder use was more common in dirty/infected cases (27% vs 17%) and in surgeries with longer operative times (median 160 vs 141 minutes).

Results: There were 116 patients (8%) with postoperative infections. Variables associated with postoperative infection on univariate analysis included increased age, infected/dirty surgeries, tobacco use, alcoholism, illicit drug use, cardiovascular disease, chronic kidney disease (CKD), cirrhosis, hepatitis, HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome), ASA (American Society of Anesthesiologists) score, operative time, and no local antibiotic powder application. On multivariate analysis, factors that remained associated with postoperative infection included increased age (odds ratio [OR], 95% confidence interval (5, 1.4-19), infected/dirty surgeries (OR 2.8, 1.8-4.5), alcoholism (OR 1.8, 1.1-3.2), illicit drug use (OR 1.8, 1.02-3.1), CKD (OR 2.3, 1.04-5), operative time (OR 12, 3-41), and no local antibiotic powder (OR 2, 1.3, 3.5). There was no difference in acute kidney injuries postoperatively between patients that did and did not receive local antibiotic (1% vs 3%).

Conclusion: Application of local antibiotic powder in orthopaedic trauma surgery was independently associated with reduced postoperative infections and did not increase the risk of acute kidney injury.