Association of Acute Kidney Injury with Antibiotic Loaded Cement Products During Orthopedic Procedures

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INTRODUCTION: Antibiotic loaded bone cement (ALBC) is commonly used in the treatment of periprosthetic joint infections (PJI) to increase the local concentration of antibiotic at the site of infection. ALBC has been associated with rare instances of acute kidney injury (AKI) due to systemic absorption of the nephrotoxic antibiotics, though the incidence of AKI is unknown. The purpose of this study was to determine the incidence of AKI associated with ALBC and to identify risk factors for the development of AKI.

METHODS: This was a single-site, retrospective cohort study comparing (a) 162 PJI patients who underwent a Stage 1 Revision to a spacer with ALBC vs. (b) 115 PJI patients who underwent a Debridement with Implant Retention (DAIR) without the use of ALBC. Both groups of patients received similar systemic antibiotics post-operatively. The primary outcome measure was the development of AKI within eight weeks of surgery. AKI was defined as an increase in serum creatinine by 0.3 mg/dl or to 1.5 times baseline. Descriptive statistics and multivariable logistic regression were used to analyze risk factors for AKI.

RESULTS: AKI occurred in 31 (19.1%) patients in the ALBC group and 17 (14.7%) patients in the DAIR group (odds ratio=1.62; 95% CI=0.78-3.36). While not significant, those with AKI in the ALBC group trended towards having more severe AKI. Chronic kidney disease, systemic vancomycin, and diuretic use were independent predictors of AKI in patients undergoing an either treatment for PJI.

DISCUSSION AND CONCLUSION:

AKI occurred in 17% of all PJI patients receiving either a spacer with ALBC or a DAIR. The use of ALBC was not associated with a statistically significant increased risk of AKI. However, the use of systemic vancomycin and diuretic use were independent predictors of AKI in this patient population.