Superior Clinical Results With Intraosseous Vancomycin In Primary Total Knee Arthroplasty

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INTRODUCTION: Periprosthetic joint infection (PJI) remains one of the most feared complications after total knee arthroplasty (TKA). The purpose of this study is to evaluate longer clinical follow-up for our initial findings of improved post-operative infection rates utilizing intraosseous (IO) over intravenous (IV) vancomycin for primary TKA.

METHODS:

This is a single-institution retrospective review on primary TKA patients who underwent surgery from May 2016 to May 2023 by 3 orthopedic surgeons with a minimum of 90-day follow-up. IV vancomycin was administered in 549 cases and IO vancomycin was administered in 1303 cases. All patients in the IV group received a weight-based dose of vancomycin prior to incision and the IO group received 500mg of vancomycin in the proximal tibia after tourniquet inflation. All patients also received a weight-based dose of IV cefazolin perioperatively. Postoperative complications and infection outcomes were gathered from the electronic medical record. The 2018 Musculoskeletal Infection Society criteria were used to diagnose PJI versus superficial infection. Acute kidney injury (AKI) was defined as a creatinine increase of 0.3mg/dL post-operatively. Fisher's Exact tests and Chi-Square tests were used to compare categorical outcomes.

RESULTS:

The IO group demonstrated a significantly lower incidence of PJI compared to the IV group at 90-day follow-up (0.5% versus 1.6%, *P*=0.019), but not at 30-days (0.2% versus 0.7%, *P*=0.206) or 1-year (0.9%, versus 2.0%, *P*=0.089). There was a significantly lower follow-up rate for the IO group at 1-year (68% versus 81%, *P*<0.001). There was a significantly lower incidence of AKI in the IO group (1.6% versus 3.8%, *P*=0.017). There was no difference for the IO compared to IV group for the incidence of deep vein thrombosis (0.7% versus 0.9%, *P*=0.62) and pulmonary embolism (0.5% versus 0.2%, *P*=0.45).

DISCUSSION AND CONCLUSION: For our primary TKA cohort with increased case number and clinical follow-up, IO vancomycin again demonstrated reduced rate of PJI over IV vancomycin at 90-days and trended toward significance at 1-year. A secondary benefit of IO vancomycin was reduced incidence of AKI after primary TKA.

Outcome	Post-Operative Time Frame	IV, N (%)	IO, N (%)	P-value
Periprosthetic Joint Infection	30 Day	4 (0.7%)	3 (0.2%)	0.206
	90 Day	9 (1.6%)	7 (0.5%)	**0.019**
	1 Year	9 (2.0%)	8 (0.9%)	0.089
Acute Kidney Injury	30 Days	14 (3.8%)	14 (1.6%)	**0.0173**
Deep Vein Thrombosis	90 Days	5 (0.9%)	9 (0.7%)	0.6176
Pulmonary Embolism	90 Days	1 (0.2%)	7 (0.5%)	0.4491