

Intraosseous Vancomycin Administration During DAIR is Associated with Reduced Infection-Related Revision Rates

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INTRODUCTION:

Intraosseous (IO) vancomycin may play a role during debridement, antibiotics and implant retention (DAIR) for treatment of periprosthetic joint infection (PJI) in infected total knee arthroplasty (TKA). investigation was to study trends in utilization of IO vancomycin and to compare 2-year complication rates to patients who did not receive IO vancomycin.

METHODS:

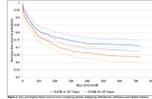
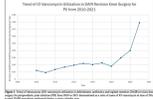
A retrospective review of a large administrative claims database was performed to identify patients undergoing DAIR for PJI of TKA between 2010 and 2023. Utilization was determined by annual procedural volume with and without IO vancomycin. Patients with CPT codes for administration of intravenous (IV) vancomycin the day of their DAIR were excluded. A matched cohort analysis was performed by matching IO vancomycin patients to a control cohort based on age, gender and comorbidity burden. Univariate and multivariate regression analyses were performed to compare 90-day and 2-year outcomes between cohorts.

RESULTS:

Utilization of IO vancomycin during DAIR was negligible from 2010 to 2017 when exponential growth occurred until 2021 (0.02% to 0.08%). A total of 1,084 patients were included in the final matched analysis, of which 542 underwent IO vancomycin administration at the time of DAIR. IO vancomycin was associated with fewer 90-day complications including revision TKA (10.9% vs. 17.0%; $p < 0.005$) and acute kidney injury (6.1% vs. 11.8%; $p < 0.001$). At 2-year follow up, patients who received IO vancomycin were less likely to undergo subsequent DAIR (OR: 0.57; $p = 0.031$), 2-stage exchange (OR: 0.55; $p < 0.001$), above knee amputation (OR: 0.44; $p = 0.035$) or any revision TKA (OR: 0.60; $p < 0.001$).

DISCUSSION AND CONCLUSION: Utilization of IO vancomycin during DAIR has grown exponentially over the past 5 years. Administration of IO vancomycin during DAIR for PJI of TKA is associated with a decrease in revision TKA at 90-days and 2-years postoperatively, without an increase in the rate of AKI or other 90-day complications.

Year	IO Vancomycin Utilization (%)
2010	0.02
2011	0.02
2012	0.02
2013	0.02
2014	0.02
2015	0.02
2016	0.02
2017	0.02
2018	0.02
2019	0.02
2020	0.02
2021	0.08
2022	0.08
2023	0.08



Complication	IO Vancomycin Group (%)	Control Group (%)	p-value
Revision TKA at 90 days	10.9	17.0	< 0.005
Acute Kidney Injury (AKI) at 90 days	6.1	11.8	< 0.001

Outcome	IO Vancomycin Group (OR)	Control Group (OR)	p-value
Subsequent DAIR	0.57	1.0	0.031
2-stage exchange	0.55	1.0	< 0.001
Above knee amputation	0.44	1.0	0.035
Any revision TKA	0.60	1.0	< 0.001

Complication	IO Vancomycin Group (%)	Control Group (%)	p-value
90-day complications (excluding AKI)	10.9	17.0	< 0.005

Complication	IO Vancomycin Group (%)	Control Group (%)	p-value
90-day complications (including AKI)	17.0	17.0	NS