

Three-Month Wound Complication and Infection Rates After Vancomycin Powder and Dilute Povidone Iodine Lavage for Infection Prophylaxis in High-Risk Total Hip Arthroplasty: A Multicenter Randomized Control Trial

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INTRODUCTION:

Periprosthetic joint infection (PJI) remains a devastating complication following total hip arthroplasty (THA), placing significant burden upon patients and providers. Specific risk factors predispose certain patients to the development of PJI, and these patients may benefit from additional protocols to mitigate infection risk. This study aimed to investigate the effects of four different combinations of wound irrigation protocols for THA patients at high risk for infection.

METHODS: A multicenter, randomized controlled trial was performed, including only high-risk patients as defined by: over 75 years old, body mass index greater than 35 kg/m², active smoker, American Society of Anesthesiologists score greater than 2, immunosuppression, diabetes mellitus, or colonization with *Staphylococcus aureus*. A total of 821 patients were randomized into one of four treatment cohorts: povidone iodine and topical vancomycin powder (220 patients), povidone iodine alone (215 patients), topical vancomycin powder alone (199 patients), or saline alone (187 patients). We collected demographic and surgical data, as well as data on three-month wound complications, infections, and surgical outcomes (Tables 1 & 2).

RESULTS:

There were no differences in rates of persistent wound drainage or dehiscence across the four groups ($P=0.98$, Table 2). There were no differences in rates of cellulitis or abscess ($P=0.81$, Table 2). There were no differences in 3-month infection rates across the four groups ($P=0.14$, Table 2), nor were there differences in the type of septic revisions performed ($P=0.51$, Table 2). While approaching statistical significance, there were no differences in aseptic revision rates across the four groups ($P=0.07$, Table 2). There were no differences in emergency department visits or readmissions across the four groups ($P=0.61$ and $P=0.78$, respectively, Table 2).

DISCUSSION AND CONCLUSION: There were no statistically significant differences in PJI or other related complications following THA among the study cohorts. Therefore, the use of such prophylactic measures including povidone-iodine and vancomycin powder can be left up to surgeon discretion.

Table 1. Baseline characteristics stratified by prophylactic treatment cohort

	Vancomycin (n = 199)	Iodine (n = 215)	Vancomycin & Iodine (n = 220)	Saline (n = 187)	P-value
Mean Age (SD)	65.24 (12.52)	66.71 (13.35)	63.29 (12.50)	65.29 (12.52)	0.048
Sex, n (%)					0.714
Female	116 (58.3)	116 (54.2)	118 (53.6)	107 (57.5)	
Male	83 (41.7)	98 (45.8)	102 (46.4)	79 (42.5)	
Race, n (%)					0.036
White	134 (67.3)	158 (73.5)	136 (61.8)	137 (73.3)	
Black	35 (17.6)	31 (14.4)	53 (24.1)	30 (16.0)	
Asian	3 (1.5)	0 (0)	1 (0.5)	4 (2.1)	
Other	27 (13.6)	26 (12.1)	30 (13.6)	16 (8.6)	
Diabetes, n (%)	49 (24.6)	64 (30.2)	52 (23.7)	38 (20.3)	0.142
Smoking Status, n (%)					0.435
Current	27 (13.6)	31 (14.6)	42 (19.1)	30 (16.0)	
Former	80 (40.4)	81 (38.0)	83 (37.7)	60 (32.1)	
Never	91 (46.0)	101 (47.4)	95 (43.2)	97 (51.9)	
ASA Score, n (%)					0.774
1	1 (0.5)	1 (0.5)	2 (0.9)	2 (1.1)	
2	84 (42.6)	89 (42.0)	100 (45.5)	84 (45.2)	
3	107 (54.3)	113 (53.3)	115 (52.3)	97 (52.2)	
4	5 (2.5)	9 (4.2)	3 (1.4)	3 (1.6)	
Mean BMI (SD)	31.98 (7.18)	32.15 (7.27)	33.86 (7.84)	32.53 (7.38)	0.037
Mean CCI (SD)	3.42 (2.66)	3.60 (2.70)	3.16 (2.45)	2.97 (2.17)	0.071

ASA, American Society of Anesthesiologists; BMI, Body mass index; CCI, Charlson Comorbidity Index; SD, Standard deviation.

Table 2. Clinical outcomes stratified by prophylactic treatment cohort

	Vancomycin (n = 199)	Iodine (n = 215)	Vancomycin & Iodine (n = 220)	Saline (n = 187)	P-value
Persistent Wound Drainage or Dehiscence, n (%)	5 (2.5)	6 (2.8)	7 (3.2)	5 (2.7)	0.979
Cellulitis or Abscess, n (%)	0 (0)	1 (0.5)	1 (0.5)	1 (0.5)	0.805
Infection Requiring Septic Revision, n (%)	0 (0)	0 (0)	3 (1.4)	1 (0.5)	0.137
Septic Revision Type, n (%)					0.505
DAIR	0 (0)	0 (0)	2 (66.7)	1 (100.0)	
Single-Stage	0 (0)	0 (0)	1 (33.3)	0 (0)	
Aseptic Revision, n (%)	6 (3.0)	4 (1.9)	0 (0)	2 (1.1)	0.071
ED Visit, n (%)	10 (5.0)	7 (3.3)	9 (4.1)	11 (5.9)	0.611
Readmission, n (%)	5 (2.5)	3 (1.4)	4 (1.8)	5 (2.7)	0.782

DAIR, debridement, antibiotics, and implant retention; ED, Emergency department