

Assessment of Preoperative and Postoperative Antibiotic Use in Operating Room Surgical Wound Debridements: A Retrospective Cohort Study



Avi Hatami MD¹, Michael Castellano MD^{1,2}, Cindy Alsamarraie MS¹, Brian Gillette PhD^{1,2}, Scott Gorenstein MD FACEP^{1,2}
¹NYU Langone Hospital Long Island, ²NYU Long Island School of Medicine

INTRODUCTION

- Preoperative antibiotic prophylaxis (PAP) is the delivery of systemic antibiotics immediately prior to surgery
- The goal of PAP is to prevent development of postoperative infections while avoiding antibiotic-related complications such as allergic reactions, disruptions to the microbiome, development of resistant organisms, *clostridium difficile* infections etc.^{1,2}
- There is evidence for the effectiveness of PAP in many surgical contexts³, however there are no published studies that have examined safety and efficacy of PAP in the context of operating room (OR)-based wound debridements
- Patients with chronic wounds requiring frequent (often weekly) OR-based debridements may be at higher risk for PAP-related complications
- In our center, PAP has been reserved for wounds that show signs of clinical infection as well as clinical indications in which PAP is clearly indicated such as in patients with mechanical prosthetic valves
- The objective of this study was to retrospectively review use of PAP in OR debridements and assess postoperative infections requiring antibiotics in the postoperative followup period

METHODS

- This study was an IRB-approved retrospective case review of outpatient OR-based surgical debridements occurring between June 1 and August 31, 2020
- Exclusion criteria:
 - Debridement with placement of skin graft or antimicrobial wound matrix
 - Hospital admission immediately after the debridement
- Data collected:
 - Demographics (age, sex, comorbidities)
 - Wound type
 - PAP use for debridement
 - Outcome measures:
 - Antibiotic use within 30 days
 - Hospital admission within 30 days
 - Emergency department (ED) admissions within 30 days
 - Mortality within 30 days
 - Time to first follow up and number of follow up visits within 30 days

RESULTS

Table 1: Baseline Characteristics

Number of patients	43
Number of debridements	53
Age (median, range)	73, 36 - 96
Sex distribution	
Male	18 (41%)
Female	25 (58%)
Comorbidity distribution	
Hypertension	23 (53%)
Diabetes Mellitus	16 (37%)
Hyperlipidemia	12 (37%)
Congestive Heart Failure	12(37%)
Obesity	8 (18%)

Table 2: Wound Types

Pressure injury stage IV	17 (39.5%)
Venous Leg Ulcer (VLU)	16 (37.2%)
Diabetic Foot ulcer (DFU)	4 (9.3%)
External surgical wound	2 (4.7%)
Traumatic Wound	1 (2.3%)
Cutaneous abscess	1 (2.3%)
Sebaceous Cyst	1 (2.3%)
Hidradenitis suppurativa	1 (2.3%)

Table 4: Outcome Measures

PAP status	PAP	No PAP
Systemic antibiotics within 10 days	20 (71.4%)	7 (28.0%)
Systemic antibiotics within 10-30 days	2 (7.1%)	5 (20.0%)
30-day ED admissions	0 (0%)	2 (8.0%)
30-day hospital admissions	0 (0%)	2 (8.0%)
30-day mortality	1 (3.6%)	0 (0%)

Table 3: PAP Use and Follow Up

PAP use for debridement	28 (52.8%)
No PAP for debridement	25 (47.2%)
Days until 1st follow up visit (median, range)	7, 3-19
Number of follow up visits (median, range)	4, 1-5

DISCUSSION

- In this retrospective case series, we saw a surprisingly high rate of infections requiring antibiotics in the 10-day post-operative period in both groups, and a substantially higher rate for patients that received PAP compared to those that did not
- A potential explanation is that since the operative surgeon had no clear guidelines for using PAP, there may have been a selection bias in the use of PAP towards patients who were at higher risk of post-operative infection
- Limitations: since this was a retrospective observational study of EMR data from a highly heterogeneous and relatively small cohort, no comparison of post-operative infection and complication rates with and without PAP can be reasonably made
- Randomized controlled trials are warranted to determine the safety, efficacy, and optimal use of PAP in the context of OR-based wound debridements

REFERENCES

1. Crader MF, Varacallo M. Preoperative Antibiotic Prophylaxis. [Updated 2021 Jul 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK442032/>
2. Decker BK, Nagrebetsky A, Lipsett PA, Wiener-Kronish JP, O'Grady NP; Controversies in Perioperative Antimicrobial Prophylaxis. *Anesthesiology* 2020; 132:586–597 doi: <https://doi.org/10.1097/ALN.0000000000003075>
3. Bratzler DW, Dellinger EP, Olsen KM, Perl TM, Auwaerter PG, Bolon MK, Fish DN, Napolitano LM, Sawyer RG, Slain D, Steinberg JP, Weinstein RA; American Society of Health-System Pharmacists; Infectious Disease Society of America; Surgical Infection Society; Society for Healthcare Epidemiology of America. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Am J Health Syst Pharm*. 2013 Feb 1;70(3):195-283. doi: 10.2146/ajhp120568. PMID: 23327981. B. Setiawan. The Role of Prophylactic Antibiotics in Preventing Perioperative Infection. Vol 43, Number 4. October 2011. <http://www.inaactamedica.org/archives/2011/22156360.pdf>