



Post-Extraction Infection and Antibiotic Prescribing Among Veterans Receiving Dental Extractions

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BACKGROUND

- Dentists prescribe approximately 10% of outpatient antibiotics, equivalent to ~24.5 million prescriptions annually in the United States¹
- Antibiotics are primarily prescribed by dentists for the management of bacterial oral infections and for prevention of infective endocarditis¹
- At present, there is limited data describing the dental prescribing patterns and outcomes of adjunctive antibiotics with tooth extraction for the treatment of dental infections^{2,3}
- Understanding the incidence and risk factors for post-extraction infectious complications may assist dental providers in judicious and optimal use of post-extraction oral antibiotics

STUDY AIMS

1. To compare the incidence of post-extraction infection among Veterans that received adjunctive antibiotics vs. no antibiotics
2. To determine predictors for antibiotic prescribing
3. To determine risk factors for post-extraction infections

METHODS

- **Design:** Retrospective cohort study of national VA dental clinic encounters from January 2017-December 2017
- **Patient population:** Stratified random sample selected by geographic location and type of tooth extraction (surgical/non-surgical extractions)
 - *Inclusion criteria:*
 - ❖ Dental extraction(s) defined by the American Dental Association (ADA) dental procedure codes (CDTs) D7210, D7250 and D7140
 - ❖ For subjects who received an antibiotic post-extraction, must be dispensed on day of extraction
- **Data collection:**
 - *Database:* Patient demographics, facility location and CDT procedure codes
 - *Electronic chart review:* immunocompromising health conditions, presence of bone disease, tobacco use history, tooth extraction procedures, antibiotic prescriptions, provider type, surgical time-out documentation and medical/dental follow-up information
- **Primary outcome:** occurrence of a “possible” or “likely” infection within 30 days of tooth extraction
 - *Possible:* signs/symptoms described by the patient/provider consistent with infection
 - *Likely:* provider-documented diagnosis of infection
 - *Unlikely:* no signs/symptoms or diagnosis of infection documented or subject did not have follow-up
- **Analysis:** Statistical differences were compared between subjects who received antibiotics vs. subjects who did not receive antibiotics
 - *Statistical tests performed:* independent t-test, Chi-square test, Fisher’s exact test, Kruskal-Wallis test, logistic regression analysis

RESULTS

Figure 1. Study Flowchart.

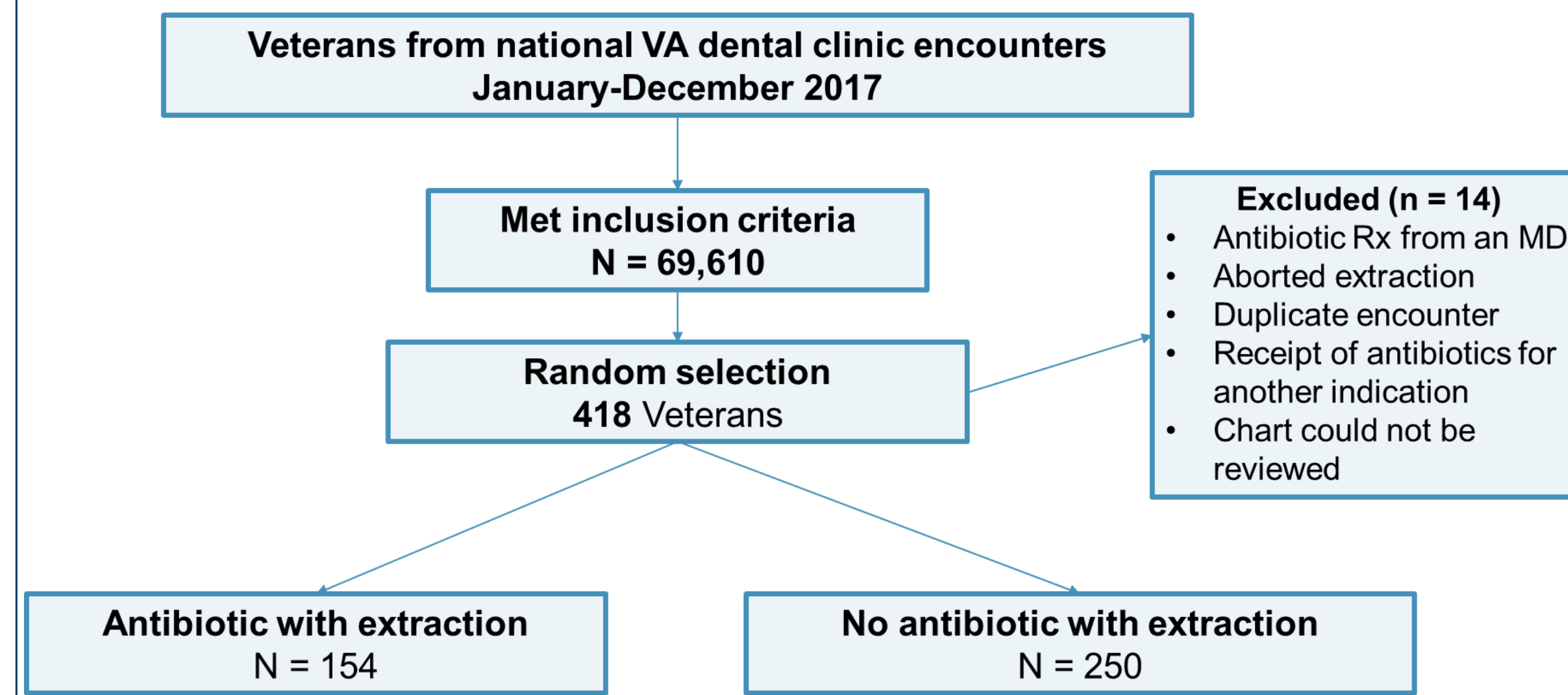


Figure 2. Documented Antibiotic Indication.

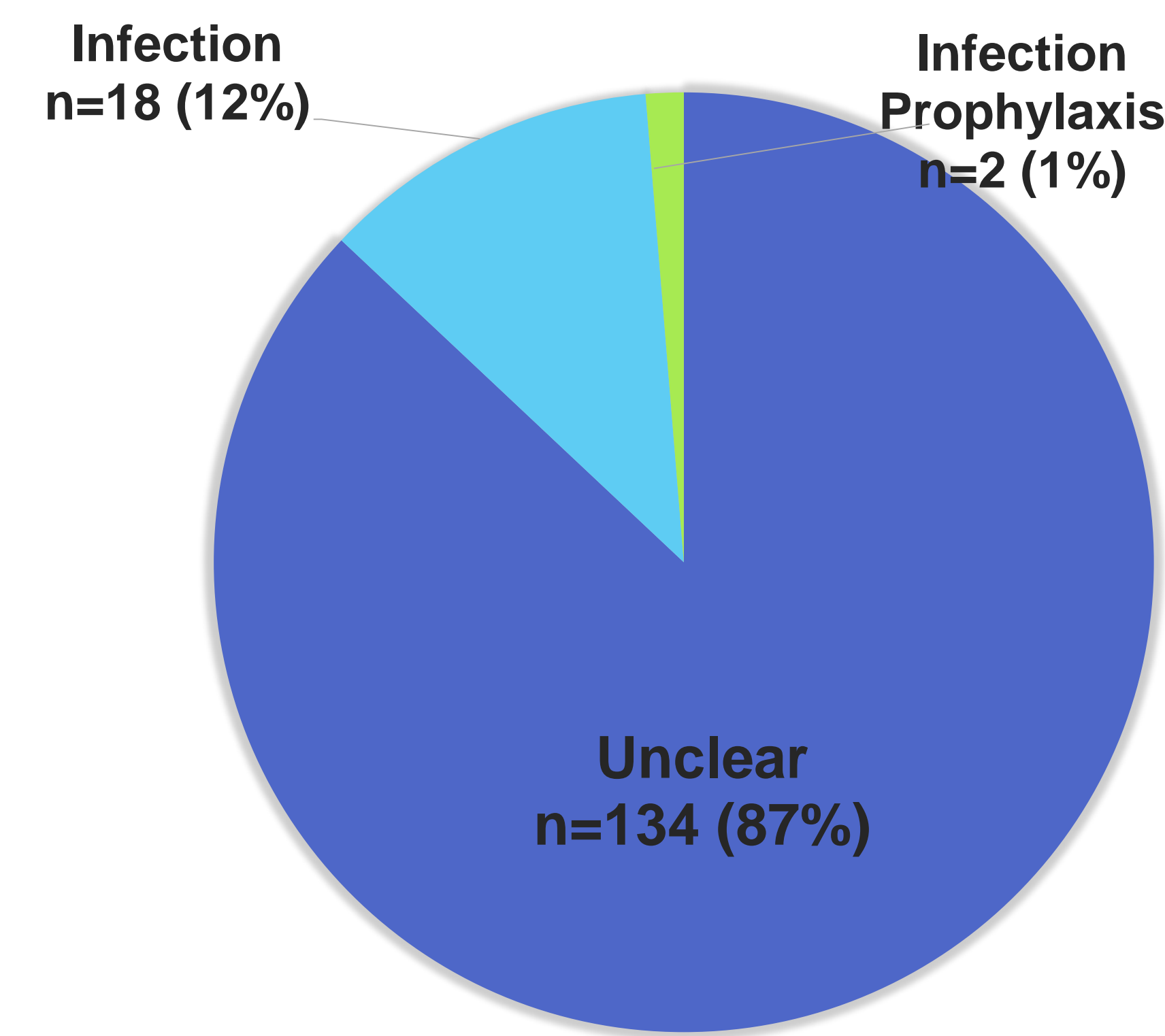


Figure 3. Possible or Likely Post-Extraction Infection.

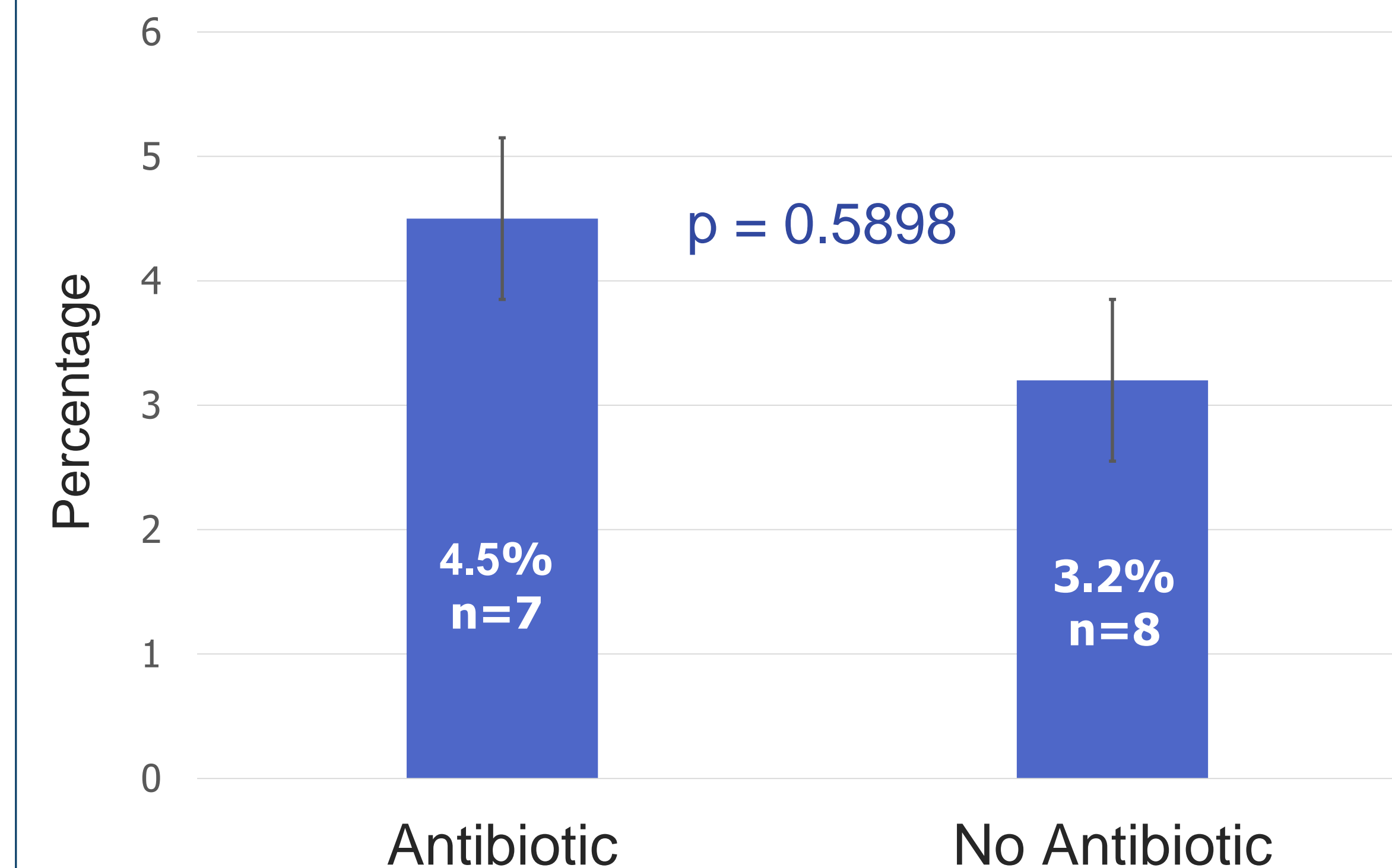


Table 1. Patient Demographics.*

	Overall (N=404)	Antibiotic (n=154)	No Antibiotic (n=250)	p-value
Age (years), mean (SD)	61.6 (13.2)	60.2 (14.1)	62.5 (12.6)	0.1094
Female sex, n(%)	33 (8.2)	10 (6.4)	23 (9.2)	0.3347
Race, n(%)				0.5209
White	270 (66.8)	108 (70.1)	162 (64.8)	
Black	101 (25.0)	37 (24.0)	64 (25.6)	
Other	13 (3.2)	4 (2.6)	9 (3.6)	
Procedures performed, n(%)				0.023
Non-surgical	197 (48.8)	64 (41.5)	133 (53.2)	
Surgical	207 (51.2)	90 (58.4)	117 (46.8)	
No. teeth extracted, mean (SD)	2.7 (3.5)	3.6 (4.4)	2.2 (3.0)	0.0041
Extraction of molars, n(%)	251 (62.1)	113 (73.4)	138 (55.2)	0.0003
Acute infection at time of extraction, n(%)	51 (12.6)	32 (20.8)	19 (7.6)	0.0001
Adjunctive surgical procedure, n(%)	120 (29.7)	55 (35.7)	65 (26.7)	0.038
Alveoplasty	103 (25.5)	49 (31.8)	54 (21.6)	0.0221
Ostectomy	28 (6.9)	11 (7.1)	17 (6.8)	0.8952
Tori removal	3 (0.7)	2 (0.7)	1 (0.4)	0.3068
Provider type, n(%)				<0.00001
General dentist	230 (56.9)	63 (40.9)	167 (66.8)	
Oral maxillofacial surgeon	154 (38.1)	77 (50.0)	77 (30.8)	
Periodontist/prosthodontist/other	20 (5.0)	14 (9.9)	6 (2.4)	

*There were no significant differences in region, tobacco use, diabetes mellitus, active malignancy, HIV, immunosuppressive medications, history of bone disease, or performance of a surgical time-out

Table 2. Predictors for Patient Receipt of an Antibiotic.

Predictor	Adjusted Odds Ratio (95% CI)	p-value
Number of teeth extracted	1.10 (1.03-1.18)	0.0056
Acute infection at time of extraction	3.02 (1.57-5.82)	0.0009
Dentist type vs. general dentist		
Oral maxillofacial surgeon	2.29 (1.45-3.60)	0.0004
Periodontist/prosthodontist/other	5.77 (2.05-16.19)	0.0009
Extraction of molars	1.78 (1.10-2.86)	0.0165

LIMITATIONS

- Retrospective study
- Groups not balanced at baseline
- Chart review relies on accurate and consistent documentation by providers
- Study population older and predominantly male
- Dental or medical care received outside of a VA facility was not captured
- Post-extraction rates of infection herein were lower than rates in previous studies which provided the basis for power calculations

CONCLUSIONS

- Post-extraction infection occurred at a low rate and there was no difference in infection between subjects that received adjunctive antibiotics vs. subjects that did not receive adjunctive antibiotics
- Subjects that received post-extraction antibiotic prescriptions were more likely to have a greater number of teeth extracted, an acute infection at time of extraction, a specialty dentist provider and extraction of molars
- The indication for antibiotic prescriptions was poorly documented indicating an opportunity for antimicrobial stewardship intervention
- This study provides rationale for conducting large, prospective trials to more clearly define the role of adjunctive antibiotics in tooth extractions for periodontitis and dentoalveolar infections, especially in patients with comorbidities

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