Postoperative Antibiotics May Be Unnecessary in Pediatric Patients Hospitalized With Minor Odontogenic Infections

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Background: Antibiotic overuse is a growing concern in health care. For pediatric odontogenic infections, the necessity of postoperative antibiotics lacks clear, evidence-based guidelines.

Purpose: The purpose of this study was to compare treatment outcomes between pediatric patients hospitalized with vestibular space odontogenic infections who received postoperative antibiotics and those who did not.

Study Design, Setting, Sample: This ambispective cohort study was conducted at the Baruch Padeh "Tzafon" Medical Center, Poriya, Israel (January 2010-December 2015 for retrospective and November 2018-December 2019 for prospective). The sample included 522 pediatric patients (<15 years) hospitalized for odontogenic infections requiring surgical intervention. Patients with nonodontogenic infections, compromised immune systems, or infections involving deeper spaces were excluded.

Predictor/Independent Variable: The primary predictor was postoperative antibiotic management (administration vs no administration), decided at hospital admission.

Main Outcome Variable(s): The primary outcome variable was hospital length of stay (LOS), categorized as short (1 to 2 days) or extended (≥3 days). LOS was chosen as a proxy for recovery time and symptom resolution, reflecting the overall efficacy of the treatment approach.

Covariates: Demographic, clinical, and laboratory data were collected.

Analyses: Descriptive statistics, Student t-tests, χ^2 tests, and multivariable logistic regression were used ($P < .05$).

Results: Of 522 patients (411 control, 111 study), mean LOS was similar between groups: 1.7 ± 0.91 days (control) versus 1.67 ± 0.9 days (study) ($P = .76$). Short stays were not significantly different (90.99 vs 87.10%, $P = .32$). Multivariable analysis showed no association between withholding antibiotics and extended stay (odds ratio [OR] = 0.92, 95% confidence interval [CI]: 0.45 to 1.89, $P = .82$), but identified age (OR = 1.11, 95% CI: 1.02 to 1.21, $P = .02$) and initial white blood cell count (OR = 1.08, 95% CI: 1.01 to 1.15, $P = .03$) as predictors of extended stay.

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Conclusion and Relevance: Withholding routine postoperative antibiotics in pediatric patients with odontogenic infections does not significantly impact length of hospital stay. While length of stay is not a direct measure of clinical outcome, it serves as a proxy for recovery. This approach may contribute to antibiotic stewardship efforts without compromising patient care, though future studies with direct clinical outcome measures are needed to confirm these findings.

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Odontogenic infections are common in pediatric populations and can lead to serious complications if not managed properly.[1-7] The standard of care for these infections typically involves surgical intervention followed by a course of postoperative antibiotics.[3,8-12] However, the necessity of postoperative antibiotics has been questioned in recent years, particularly in light of growing concerns about antibiotic overuse and resistance.

Our previous study examined factors associated with prolonged hospitalizations from odontogenic infections in children.[13] We found that older child age and higher white blood cell (WBC) counts on admission were indicators for prolonged length of stay (LOS). Building upon these findings, the current study aims to investigate whether postoperative antibiotics are necessary for pediatric patients treated for odontogenic infections.

The overuse of antibiotics is a global medical concern with potentially devastating consequences, including the development of antibiotic-resistant bacteria and disruption of the normal microbiome.[1,14-16] In pediatric dentistry, where odontogenic infections are common, it is crucial to establish evidence-based protocols that balance effective treatment with antibiotic stewardship.[17,18]

Odontogenic infections are typically polymicrobial, with anaerobic bacteria often outnumbering aerobic bacteria by a factor of 2.[19-25] The mechanisms initiating these mixed infections are not fully understood, but it is believed that pathological metabolic cooperation exists between the pathogens, allowing them to evade host immune responses and increase their virulence.[12,25-27]

Previous research has suggested that surgical intervention alone may be sufficient for treating odontogenic infections in many cases.[5,8,9] For instance, several studies reported that rapid surgical treatment reduced hospitalization time, minimized the risk of life-threatening complications, and lowered treatment costs time for pediatric patients with odontogenic infections.[11,28-31] However, there is a lack of prospective studies directly comparing outcomes between patients treated with and without postoperative antibiotics.

The purpose of this study was to investigate the necessity of postoperative antibiotics in pediatric patients treated for vestibular space odontogenic infections. We hypothesized that withholding routine postoperative antibiotics in selected cases would not negatively impact patient outcomes. Our specific aim was to compare outcomes between patients who received postoperative antibiotics and those who did not, with a primary focus on hospital LOS.

Methods

STUDY DESIGN AND SAMPLE

This ambispective cohort study was conducted at the Baruch Padeh "Tzafon" Medical Center, Poriya, Israel. The study population comprised all pediatric patients (age <15 years) who presented for the evaluation and management of odontogenic infections between January 2010 to December 2015 and November 2018 to December 2019. These periods were chosen to reflect a change in hospital protocol regarding postoperative antibiotic use in pediatric odontogenic infections.

This study was approved by the Institutional Review Board of the Baruch Padeh Medical Center (approval number 0093-15-POR). The institutional review board granted a waiver of informed consent for this study due to its nature involving retrospective data analysis and a change in standard treatment protocol.

Patients were included if they had vestibular space odontogenic infections requiring inpatient surgical intervention, characterized by localized vestibular swelling not extending to the perimandibular or periorbital spaces. Included patients were free of systemic signs of infection, had no compromised immune system or underlying medical conditions, and showed no involvement of deeper facial spaces. This careful selection process aimed to identify otherwise healthy patients with localized infections who might be suitable for a more conservative antibiotic approach.

Exclusion criteria were: *1)* infections in the head and neck region not of odontogenic origin; *2)* compromised immune systems or underlying medical conditions; *3)* swelling involving the periorbital, sublingual, submandibular, submental, or deeper spaces; and *4)* systemic signs such as fever.

While vestibular abscesses in adults are often managed on an outpatient basis, our protocol for pediatric patients involves hospital admission for several

reasons. Firstly, children with odontogenic infections can decompensate more rapidly than adults, necessitating close monitoring. Secondly, ensuring compliance with treatment and adequate pain management can be challenging in outpatient settings for pediatric patients. Additionally, the need for surgical intervention under general anesthesia often requires hospital admission.

The study comprised 2 groups, reflecting a change in hospital protocol regarding postoperative antibiotic use. The control group data were collected as part of a previous study.[13] This retrospective cohort included patients treated between January 2010 and December 2015, when postoperative antibiotics were routinely prescribed. The study group included patients treated between November 2018 and December 2019, after the implementation of a new protocol limiting postoperative antibiotic use. The gap between December 2015 and November 2018 represents a transition period during which the new protocol was developed, staffs were trained, and implementation was gradually phased in.

VARIABLES AND TREATMENT PROTOCOL

The primary predictor variable was the administration of postoperative antibiotics. This was a binary variable: patients either received postoperative antibiotics (control group) or did not receive postoperative antibiotics (study group). The decision to administer postoperative antibiotics was made as part of the initial treatment protocol upon hospital admission, not at the end of the hospital stay.

The control group received standard care, including surgical intervention followed by postoperative antibiotics. The study group received surgical intervention with only a single perioperative antibiotic dose, unless specific clinical circumstances necessitated postoperative antibiotics.

We used an intention-to-treat analysis, maintaining patients' initial group classification regardless of subsequent treatment changes. Four patients in the study group who received postoperative antibiotics due to clinical necessity remained classified in this group for analysis, preserving prognostic balance and reflecting real-world scenarios.

The primary outcome variable was hospital LOS. LOS was chosen as a proxy for recovery time and symptom resolution, reflecting the overall efficacy of the treatment approach. It was analyzed as a categorical variable, with LOS categorized as short (1-2 days) or extended (≥3 days). This categorization was based on clinical experience and the typical course of recovery for pediatric patients with vestibular space odontogenic infections.

A short stay of 1-2 days indicates that the patient remained hospitalized only for the necessary time for initial recovery and was discharged when their condition was deemed satisfactory. An extended stay of 3 or more days suggests that the recovery was slower than expected or that complications may have arisen, requiring additional monitoring.

Covariates included demographic data (age, sex), clinical data (infection location), and laboratory data (WBC count, platelet count, and neutrophil count). These variables were collected to account for potential confounding factors that could influence the relationship between the predictor and outcome variables.

DATA COLLECTION

Data were collected from patient records and included demographic information (age and gender), clinical data (location of infection and length of hospital stay), and laboratory data (WBC count, platelet count, and neutrophil count on admission). For the prospective cohort, data were collected in real-time as patients were treated. For the retrospective cohort, data were extracted from medical records.

ANALYSES

An a priori power analysis was conducted using G*Power 3.1 software to determine the required sample size for detecting a difference in the proportion of short versus extended hospital stays between the 2 groups. For a χ^2 test of independence, assuming an alpha of 0.05, a power of 0.80, and a small-to-medium effect size (w = 0.2), the required total sample size was calculated to be 197. This total sample size of 197 subjects was deemed sufficient to detect the expected effect across both groups combined. Our actual sample size (522 total: 411 in the control group and 111 in the study group) exceeded this requirement, ensuring adequate power to detect clinically meaningful differences in our primary binary outcome of length of stay.

Statistical analysis was performed using GraphPad Prism (GraphPad Software, San Diego, CA, USA). Descriptive statistics were calculated for all variables. Comparisons between the study and control groups were made using Student's t-tests for continuous variables and Pearson's $\chi 2$ test or Fisher's exact test for categorical variables. LOS was measured as a continuous variable in days. For some analyses, we also categorized LOS into short (1 to 2 days) and extended (≥3 days) stays to examine potential clinical thresholds. A noninferiority test was conducted with a margin of 0.5 days to assess whether withholding antibiotics was not inferior to giving them in terms of LOS. While noninferiority tests are less commonly used in cohort studies, we included them to provide

Table 1. DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PEDIATRIC PATIENTS WITH ODONTOGENIC INFECTIONS BY POSTOPERATIVE ANTIBIOTIC USE

	Postoperative Antibiotics		
Characteristic	Yes (n = 411)	No (n = 111)	*P* Value
Age (yrs), mean ± SD	6.52 ± 2.6	6.03 ± 2.26	.07
Sex, n (%)			.52
Male	240 (58.39%)	61 (54.95%)	
Female	171 (41.61%)	50 (45.05%)	
WBC ($\times 10^6$/mL), mean ± SD	11.69 ± 3.42	10.8 ± 3.59	.09
Neutrophils (%), mean ± SD	.74 ± 0.19	.72 ± 0.11	.86
Platelets ($\times 10^3$/mL), mean ± SD	338.61 ± 89.67	335.86 ± 79.45	.77
Prior antibiotic use, n (%)			.002
Amoxicillin-clavulanic acid	77 (18.7%)	16 (14.4%)	
Amoxicillin	96 (23.4%)	19 (17.1%)	
Penicillin VK	0 (0%)	1 (0.9%)	
None	176 (42.8%)	67 (60.4%)	
Unknown	56 (13.6%)	8 (7.2%)	
Fever at admission (>38 °C), n (%)	84 (20.4%)	27 (24.3%)	.37
Productive drainage, n (%)			.96
Yes	208 (50.6%)	57 (51.4%)	
No	161 (39.2%)	42 (37.8%)	
Unknown	42 (10.2%)	12 (10.8%)	

Abbreviation: WBC, white blood cell.

Joachim et al. Post-Op Antibiotics in Pediatric Odontogenic Infection. J Oral Maxillofac Surg 2025.

additional context for interpreting our results. The noninferiority approach allows us to statistically support the claim that withholding antibiotics is not worse than giving them, within a predefined margin.

A multivariable logistic regression analysis was performed to address potential confounding factors. We performed separate regression analyses for each of our primary outcome variables to identify potential predictors. Variables for the multivariable model were selected based on clinical relevance and significant associations ($P < .1$) in univariate analyses. For all statistical tests, a two-tailed $P < .05$ was considered statistically significant.

Results

After applying the inclusion and exclusion criteria, a total of 522 subjects were included in this study: 111 in the study group (no postoperative antibiotics) and 411 in the control group (postoperative antibiotics). Table 1 presents a comparison of demographic characteristics between the study and control groups.

The mean age was slightly lower in the study group (6.03 ± 2.26 years) compared to the control group (6.52 ± 2.6 years), but this difference was not statistically significant ($P = .07$). The sex distribution was similar in both groups, with a slightly higher proportion of males in both the study group (54.95%) and the control group (58.39%), which was also not statistically significant ($P = .52$).

Table 1 presents the clinical characteristics of the study and control groups, including laboratory values and prior antibiotic use.

There were no statistically significant differences in WBC count, neutrophil percentage, or platelet count between the 2 groups ($P = .09$, $P = .86$, and $P = .77$, respectively). The incidence of fever at admission (>38 °C) and the proportion of patients with productive drainage were also similar between groups ($P = .37$ and $P = .96$, respectively).

However, a significant difference was observed in prior antibiotic use between the groups ($P = .002$). A higher proportion of patients in the study group (60.4%) had not received antibiotics before admission compared to the control group (42.8%). This difference in prior antibiotic exposure represents a potential confounding factor that warranted further investigation.

In the control group (n = 411), all patients received postoperative antibiotics as per the standard protocol. The majority (97.8%, 402/411) were treated with intravenous amoxicillin clavulanate, while 2.2% (9/411) received intravenous clindamycin due to a known Penicillin allergy. Upon discharge, 83.5% (343/411)

Table 2. COMPARISON OF COVARIATES BETWEEN SHORT AND EXTENDED LENGTH OF STAY IN PEDIATRIC ODONTOGENIC INFECTIONS

Characteristic	Short LOS (1-2 days) (n = 459)	Extended LOS (≥3 days) (n = 63)	*P* Value
Age (yrs), mean ± SD	6.28 ± 2.48	7.15 ± 2.73	.008 (t-test)
Sex, n (%)			.35 (χ^2)
Male	268 (58.39%)	33 (52.38%)	
Female	191 (41.61%)	30 (47.62%)	
WBC ($\times 10^6$/mL), mean ± SD	11.32 ± 3.41	12.59 ± 3.58	.004 (t-test)
Neutrophils (%), mean ± SD	.74 ± 0.16	.79 ± 0.12	.23 (t-test)
Platelets ($\times 10^3$/mL), mean ± SD	337.22 ± 86.94	342.67 ± 91.53	.64 (t-test)
Prior antibiotic use, n (%)			.28 (χ^2)
Any antibiotic	183 (39.87%)	26 (41.27%)	
None	220 (47.93%)	23 (36.51%)	
Unknown	56 (12.20%)	14 (22.22%)	
Fever at admission (>38 °C), n (%)	94 (20.48%)	17 (26.98%)	.23 (χ^2)
Productive drainage, n (%)			.80 (χ^2)
Yes	233 (50.76%)	32 (50.79%)	
No	180 (39.22%)	23 (36.51%)	
Unknown	46 (10.02%)	8 (12.70%)	

Abbreviations: WBC, white blood cell; LOS, length of stay.

Joachim et al. Post-Op Antibiotics in Pediatric Odontogenic Infection. J Oral Maxillofac Surg 2025.

of patients in the control group were prescribed oral amoxicillin clavulanate to continue at home.

In contrast, in the study group (n = 111), only 4 patients (3.6%) received postoperative antibiotics, representing exceptions where the treating physician deemed it necessary because the resolution of the clinical signs and symptoms of infection in these 4 cases was less than satisfactory 24 hours after surgery. The vast majority of patients in the study group (96.4%, 107/111) did not receive any postoperative antibiotics, adhering to the new protocol being tested in this study.

Importantly, no patients from either group were readmitted for hospitalization in the month following the discharge, indicating that withholding postoperative antibiotics did not lead to increased rates of infection recurrence or complications requiring readmission.

Table 2 presents the relationship between all covariates and LOS. When comparing patients with short LOS (1 to 2 days) to those with extended LOS (≥3 days), we found significant differences in age (P = .008) and initial WBC count (P = .004). Patients with extended LOS were slightly older (7.15 ± 2.73 years vs 6.28 ± 2.48 years) and had higher initial WBC counts (12.59 ± 3.58 × 10^6/mL vs 11.32 ± 3.41 × 10^6/mL). Other covariates, including sex, neutrophil percentage, platelet count, prior antibiotic use, fever at admission, and productive drainage, did not show significant differences between the LOS groups.

Table 3 presents the comparison of LOS between the study and control groups.

When categorizing LOS into short (1 to 2 days) and extended (≥3 days) stays, we observed a slightly higher percentage of short stays in the study group (90.99 vs 87.10% in the control group) and a lower percentage of extended stays (9.01 vs 12.90%). However, this difference in LOS categories was not statistically significant (P = .32).

To support our hypothesis that withholding antibiotics is not inferior to giving them, we performed a noninferiority test with a margin of 0.5 days. The difference in mean LOS (study group - control group) was −0.03 days, with the upper bound of the 95% confidence interval at 0.14 days, which is less than our prespecified noninferiority margin of 0.5 days. This supports the noninferiority of withholding postoperative antibiotics in terms of LOS.

Given the lack of association between postoperative antibiotic use and length of stay, we conducted an exploratory multivariable logistic regression analysis to identify potential risk factors for extended hospital stay. This analysis could inform future investigations. Table 4 presents the results of this exploratory analysis.

The dependent variable was extended hospital stay (≥3 days), while independent variables included treatment group (study vs control), prior antibiotic use,

Table 3. DISTRIBUTION OF LENGTH OF HOSPITAL STAY BY POSTOPERATIVE ANTIBIOTIC USE IN PEDIATRIC ODONTOGENIC INFECTIONS

Postoperative Antibiotic Use	Short LOS (1-2 days)	Extended LOS (≥3 days)	Total	*P* Value
Yes (control group)	358 (87.10%)	53 (12.90%)	411	.32
No (study group)	101 (90.99%)	10 (9.01%)	111	
Total	459 (87.93%)	63 (12.07%)	522	

Abbreviation: LOS, length of stay.

Joachim et al. Post-Op Antibiotics in Pediatric Odontogenic Infection. J Oral Maxillofac Surg 2025.

age, sex, and initial WBC count. Age (odds ratio = 1.11, 95% confidence interval: 1.02 to 1.21, P = .02) and initial WBC count (odd ratio = 1.08, 95% confidence interval: 1.01 to 1.15, P = .03) were found to be significant predictors of extended hospital stay, regardless of the treatment group.

Discussion

This study investigated the necessity of postoperative antibiotics in pediatric patients treated for odontogenic infections. Our findings suggest that withholding postoperative antibiotics does not significantly impact the length of hospital stay or overall clinical outcomes. However, these results should be interpreted with caution, considering both potential benefits and risks of this approach, particularly in light of growing concerns about antibiotic overuse and resistance.[1,14,28]

The demographic and clinical characteristics of our study and control groups were largely similar, with no significant differences in age, sex distribution, WBC count, or platelet count. This similarity provided a strong foundation for comparing outcomes between the 2 groups. We observed a significant difference in prior antibiotic use (P = .002), with a higher proportion of patients in the study group not having received antibiotics before admission. To address this potential confounding factor, we conducted a multivariable logistic regression analysis. The results demonstrated that even after adjusting for prior antibiotic use and other relevant clinical factors, the treatment group (study vs control) remained a nonsignificant predictor of extended hospital stay. This suggests that the difference in prior antibiotic use, while significant in the initial analysis, did not substantially confound the relationship between postoperative antibiotic use and length of stay.

Our observations on antibiotic prescribing practices align with previous observations of great variability in protocols and drugs of choice.[12,17,18,31] This variability underscores the need for more standardized guidelines in managing pediatric odontogenic infections. The diversity in prescribing practices highlights the complexity of treatment decisions and the potential for overuse or misuse of antibiotics in these cases.

Interestingly, our regression analysis revealed that age and initial WBC count were significant predictors of extended hospital stay, regardless of the treatment group. Specifically, older age and higher initial WBC count were associated with longer hospital stays. This finding corroborates our previous research[13] and highlights the importance of considering these factors in the management of pediatric odontogenic infections. It suggests that these clinical indicators may be more reliable predictors of treatment course than the use of postoperative antibiotics.

Our primary outcome measure, LOS, showed no significant difference between the study and the control groups. This finding aligns with previous studies questioning the necessity of postoperative antibiotics in certain surgical procedures.[32] The comparable LOS between groups suggests that overall recovery was not hindered by the omission of postoperative antibiotics. This is a crucial finding, as it challenges the conventional wisdom that routine postoperative antibiotics are necessary for optimal outcomes in these cases.[8,9,11]

In this study, we chose LOS as our primary outcome measure, which merits further discussion. While a

Table 4. MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS FOR PREDICTORS OF EXTENDED HOSPITAL STAY (≥3 DAYS) IN PEDIATRIC ODONTOGENIC INFECTIONS

Variable	Odds Ratio	95% Confidence Interval	*P* Value
Treatment group (study vs control)	0.92	0.45-1.89	.82
Prior antibiotic use	1.35	0.78-2.33	.28
Age	1.11	1.02-1.21	.02
Sex (male vs female)	0.89	0.54-1.47	.65
Initial WBC count	1.08	1.01-1.15	.03

Abbreviation: WBC, white blood cell.

Joachim et al. Post-Op Antibiotics in Pediatric Odontogenic Infection. J Oral Maxillofac Surg 2025.

direct cure or no cure outcome might seem ideal for assessing antibiotic efficacy, LOS offers several advantages in the context of pediatric odontogenic infections. Firstly, LOS provides an objective and easily quantifiable measure that indirectly reflects the resolution of infection and overall recovery. This approach aligns with previous studies that have used LOS as a key outcome measure in evaluating the management of pediatric odontogenic infections.[28-30] In our clinical practice, patients are typically discharged when their symptoms have sufficiently resolved and they are deemed well enough to continue recovery at home, making LOS a reliable proxy for treatment success. This practice is consistent with other pediatric infection management protocols.[33] Moreover, LOS allows for a quantitative comparison between the antibiotic and nonantibiotic groups, providing insight into whether withholding antibiotics delays recovery. It also has direct implications for patient care, health care costs, and resource allocation, aspects that have been highlighted in previous research on antibiotic use in pediatric infections.[1,13,28]

While our results are promising, showing no significant impact on LOS and no readmissions within a month post-treatment, it is important to acknowledge some limitations of our study. Our sample size, while substantial, may still be insufficient to detect very rare but potentially serious complications. The critical question remains: what is the risk of major complications (such as fatality or significantly extended length of stay) due to withholding antibiotics early in treatment?

This limitation underscores the need for larger, multicenter studies to more accurately assess the risk of rare but serious complications. Until such data are available, clinicians should balance the potential benefits of antibiotic stewardship against the risk of these infrequent but potentially severe outcomes.[33,34] Our findings suggest that 4 out of 111 patients in the study group required postoperative antibiotics due to nonresolution of infection signs within 24 hours, which highlights the importance of close monitoring and individualized care.

It is crucial to consider the potential risks of withholding antibiotics, which our study may not have fully captured. These include an increased risk of infection recurrence or spread, delayed identification of resistant infections, and potential complications in unidentified high-risk groups.[5,28] While we did not observe these complications in our study, their possibility underscores the importance of careful patient selection and close follow-up when considering withholding postoperative antibiotics.

It is important to note that our study group still received a single dose of perioperative antibiotics. This approach aligns with recommendations for short-term perioperative antibiotic prophylaxis in certain surgical procedures.[35,36] Future research could investigate whether even this single dose could be safely omitted in selected cases, further contributing to antibiotic stewardship efforts.

The slightly lower proportion of extended stays (≥3 days) in the study group (9.01 vs 12.90% in the control group), although not statistically significant, is an interesting observation. This trend could be explored further in larger studies to determine if there might be any potential benefits to limiting postoperative antibiotic use, such as reduced risk of antibiotic-associated complications or earlier discharge.

Our findings contribute significantly to the ongoing discussion about antibiotic stewardship in pediatric dentistry and oral surgery. They support the growing body of evidence suggesting that routine postoperative antibiotics may not be necessary in all cases of odontogenic infections in children.[30,37-39] However, it is crucial to note that individual clinical judgment remains paramount, as evidenced by the small number of patients in our study group who did receive postoperative antibiotics based on specific clinical circumstances.

This study has several limitations that should be considered when interpreting the results. These limitations primarily relate to study design, outcome measures, and potential biases.

The ambispective nature of our study introduces potential biases. The retrospective data collection for the control group could be affected by changes in clinical practice, documentation methods, or patient populations over time, potentially impacting the comparability of the 2 groups. Additionally, despite our use of an intention-to-treat approach, the potential for selection bias cannot be completely eliminated. Allowing physicians to prescribe postoperative antibiotics based on clinical judgment in the study group while reflective of real-world clinical practice and ensuring patient safety could introduce bias.

Our choice of outcome measures also presents limitations. While using LOS as the primary outcome is practical, we acknowledge that LOS may not capture all aspects of cure, and this is a limitation of our study. However, it is worth noting that no patients from either group were readmitted for hospitalization in the month following discharge, suggesting that the infections were effectively managed in both groups.

LOS serves as a proxy for recovery and resolution of infection, but future studies could benefit from more direct and comprehensive outcome measures. Furthermore, we did not include a specific measure of infection severity, such as the number of spaces involved, which could provide more nuanced insights into the relationship between infection severity and treatment outcomes.

These limitations collectively underscore the need for prospective, randomized controlled trials with more comprehensive outcome measures to validate our findings. Despite these constraints, our study provides valuable insights into the potential for reducing postoperative antibiotic use in carefully selected pediatric patients with odontogenic infections, laying the groundwork for future research in this important area.

The clinical implications of these findings are significant and could influence future treatment protocols for pediatric odontogenic infections. Our results suggest that in carefully selected cases, withholding routine postoperative antibiotics may be a safe and effective approach. This could lead to several potential benefits, including reduced risk of antibiotic-related adverse effects, decreased likelihood of contributing to antibiotic resistance, potential cost savings, and simplified postoperative care.[1,14]

However, it is crucial to emphasize that this approach should be implemented judiciously. Clinicians should consider individual patient factors, severity of infection, local antimicrobial resistance patterns, and the potential risks discussed earlier when deciding whether to prescribe postoperative antibiotics. Our findings suggest that a small subset of patients in the study group still received postoperative antibiotics based on clinical judgment, which underscores the importance of maintaining flexibility in treatment protocols and the need for ongoing clinical assessment throughout the treatment course.

Our findings suggest that withholding routine postoperative antibiotics in carefully selected pediatric patients with vestibular space odontogenic infections does not significantly impact length of hospital stay. While length of stay is not a direct measure of clinical outcome, in our practice it serves as a proxy for recovery, as patients are discharged when deemed well enough to continue recovery at home. We acknowledge the limitations of using length of stay as the primary outcome measure, and future research should incorporate more direct clinical outcome measures. Despite these limitations, our results suggest that in carefully selected cases, withholding routine postoperative antibiotics may be a viable approach that could potentially contribute to antibiotic stewardship efforts without compromising patient care. However, individual clinical judgment remains crucial, and larger prospective studies are needed to definitively establish the safety and efficacy of this approach.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

In the preparation of this manuscript, we utilized artificial intelligence (AI) tools to assist with certain aspects of the writing and submission process. Specifically, we employed an AI language model for proofreading and language editing to enhance clarity and readability. This AI tool also helped in checking our adherence to the Journal of Oral and Maxillofacial Surgery submission guidelines. Additionally, we used an AI-assisted reference management system to verify the accuracy and formatting of our citations. It is important to note that, while these AI tools provided valuable assistance, all scientific content, analysis, and conclusions were generated and verified by the human authors. The final manuscript was thoroughly reviewed and approved by all authors to ensure the integrity and accuracy of the work.

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