

Research Article

The Incidence of Antibiotic Prescription by Dentists After Tooth Extraction: A Cross-sectional Study in Erbil City

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Article History

Received: 3 November 2025

Revised: 24 January 2026

Accepted: 9 February 2026

Published online: 15 September 2026



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Abstract

Aims: The present study aimed to examine the incidence of dentists who prescribe antibiotics following extraction, identify the most often prescribed antibiotic, and ascertain the rationale behind antibiotic prescriptions.

Materials and Methods: A cross-sectional study was conducted among 150 dentists working in both private and governmental hospitals in Erbil City. Data regarding antibiotic prescribing practices following tooth extraction were collected using a structured questionnaire. The frequency of antibiotic prescription, indications for use, and the types of antibiotics prescribed were analyzed descriptively.

Results: Approximately 77% of the participating dentists reported prescribing antibiotics following dental extraction procedures. Facial swelling was identified as the most common indication for antibiotic administration (63%). Amoxicillin was the most frequently prescribed antibiotic, accounting for 65% of prescriptions.

Conclusion: The majority of dentists prescribe antibiotics following extraction. The primary rationale for prescribing antibiotics was facial edema. The most often utilized antibiotic was amoxicillin.

Keywords: Antibiotics, Amoxicillin, Dentist, Extraction.

How to cite: Younus MS. The incidence of Antibiotic Prescription by Dentists After Tooth Extraction: A Cross-sectional Study in Erbil City. Al-Rafidain Dent J. 2026;26(2):482-490.

INTRODUCTION

Oral cavity infections are typically classified as odontogenic or nonodontogenic infections (1,2). Odontogenic infections arise from conditions within a tooth and its supporting structures, whereas nonodontogenic infections do not involve dental structures (1). Dental offices constitute 4% to 15.6% of all antibiotic prescriptions among medical specialties, with a rising tendency during the COVID-19 pandemic (2,3).

Dentists use antibiotics to cure and prevent infections; nevertheless, systemic use of antibiotics in dentistry is limited, as most oral disorders may be addressed by various dental procedures. Antibiotic prescriptions in dentistry, whether for preventative or therapeutic reasons, constitute about 10% of global antibiotic prescriptions and are not always deemed appropriate, resulting in excessive or improper antibiotic utilization in dental practice (4).

Antibiotic administration in dentistry is not the initial course of action; however, it must be employed judiciously in specific instances, including severe pericoronitis, cellulitis, facial space infections, and osteomyelitis, while being unnecessary for routine dental conditions such as periapical abscess, mild pericoronitis, dry socket, and restorative procedures (5).

The utilization of antibiotics is a contentious issue among dentists, since it is essential for patient comfort during surgical extraction and for the prevention of wound infection, despite the occurrence of bacteremia during small exodontia. It also transpires during numerous other standard dental treatments where antibiotic medication is unwarranted (6).

Antibiotic resistance remains a significant issue (7,8). Numerous factors contribute to antibiotic resistance, including the improper utilization of antibiotics (9,10), in which both healthcare personnel and patients play a significant role (11,12). Such contributions must be monitored to prevent the escalation of antibiotic-resistant germs and should be prioritized by dentists (13,14). However, in essential instances,

treatment is necessitated irrespective of antibiotic resistance, such as diabetes or infections in young children (15,16).

The objectives of the study were to ascertain the prevalence of dentists in Erbil City (Iraq) who prescribe antibiotics following tooth extractions, identify the most often prescribed antibiotic, and examine the rationale behind antibiotic prescriptions.

MATERIALS AND METHODS

This study was done from early November 2023 till end of May 2024. The study's purpose was elucidated to each participant. A questionnaire with 16 items that dentists are required to answer anonymously. The questionnaire comprised questions related to the prescription of antibiotics following dental extractions in Erbil city.

The questionnaire will be administered to around 150 dentists, including general practitioners, specialists, and oral surgeons, employed in hospitals and private clinics in Erbil City, Iraq. Dentists who did not answer all questions or failed to cooperate during the questionnaire were eliminated.

Statistical examination

Data analysis was conducted utilizing SPSS (Statistical Package for Social Sciences, SPSS Inc., Chicago, USA, version 21). This encompasses descriptive statistics, which comprise numerical values, means, percentages, minimums, maximums, and standard deviations.

RESULTS

The sample comprised 150 dentists aged between 25 and 56 years, with 53% being female. The majority were general practitioners (68%), and around 28% worked exclusively in governmental settings, while 72% were employed in both commercial and public sectors, as illustrated in Table 1.

Table 1. Demographic characteristics of the studied sample.

Age in years			Gender		Specialty			Working place	
Minimum	Maximum	Mean	Male	Female	General practitioner	Specialist	Oral surgeon	G&P	G
25	56	32	47%	53 %	68%	29%	3%	72%	28%

The result showed that 77 % of the dentists prescribe antibiotics after extraction, while only 23% didn't prescribe antibiotics after extraction, as shown in Table 2.

Table 2. Antibiotic prescription after extraction

Antibiotic after extraction	Frequency	Percent
Yes	116	77%
No	34	23%

Facial swelling was the most common reason for antibiotic prescription after extraction (63%), while the least common reason was chronic periodontitis (20%) as shown in Table 3.

Table 3. The reason for antibiotic prescription

Reason	Facial swelling	Chronic periodontitis	Acute periapical abscess	Dry socket
Yes	63%	20%	51%	18%
No	37%	80%	49%	82%

Amoxicillin was the most common antibiotic prescribed by dentists after extraction (65%), while the least common was cephalosporin, which was 10% (Table 4).

Table 4. The most common antibiotic prescribed after extraction

Antibiotic	Amoxicillin	Erythromycin	Cephalosporin	Clindamycin	Metronidazole	Azithromycin
Yes	65%	22%	10%	12%	49%	39%
No	35%	78%	90%	88%	51%	61%

The results observed that most of the dentists prescribe AB for immunocompromised patients, and about half of the dentists in the sample give AB for patients with previous endocarditis and those with prosthetic heart valves; also, less than 10% did not take into consideration preventing IE.

Table 5. Prophylactic AB to prevent IE

Indication of Antibiotic	Percent %
Always	17
No	9
Previous endocarditis	57
Prosthetic heart valve	49
Immunocompromised patient	73
Others	28

DISCUSSION

Antibiotics were prescribed by dentists both for prophylactic and treatment goals in different clinical conditions; however, little information is present regarding AB prescription for the treatment of various dental conditions.

The findings indicated that 77% of dentists give antibiotics following tooth extraction, which was consistent with previous studies (17,18) (81.8% and 79.7%, respectively); however, these results vary from those reported by Shasya et al. (19) (54.4%). This may indicate that a high percentage of dentists in Erbil city prescribe AB following tooth extraction.

Approximately 50% of the dental sample prescribed antibiotics for acute periapical abscesses, which is substantially lower than the 92.6% reported by Shasya et al. (19). Additionally, the antibiotic prescription rate for chronic pericoronitis was 20%, contrasting with the 76.19% discovered by Palmer et al. (20). Facial swellings require antibiotics in approximately 63% of cases, which is comparable to the findings of Kaul et al. (21) (70%) but lower than those of Loume A et al. (22) (81.5%). This outcome may be associated with the patient's condition and the dentist's experience in managing similar cases.

The results indicated that the predominant antibiotic prescribed post-extraction was Amoxicillin at 65%, closely aligning with the findings of Suda et al. (23) (71.3%) and Gowri et al. (24) (71.7%), but differs from the results reported by Choi (17) (45.25%) and Hirayama et al. (18) (17.1%). This may be attributed to the broad spectrum of amoxicillin and the infrequency of resistance.

The use of prophylactic antibiotics in this study obviously variable than many previous studies. Antibiotic prophylaxis for immunocompromised patients was administered by 73% of dentists to prevent infective endocarditis, which was higher than that observed by Loume A et al. (22) (50%). Conversely in case of patients with prosthetic heart valves, nearly half of the dental sample prescribed antibiotics, which was lower than the 60–70% reported by Hirayama (18). In a sample of dentists, 57% administered antibiotics to patients with a prior history of endocarditis, a figure lower than the 80% reported by Sbricoli et al. (25). Additionally, almost 17% of dentists routinely prescribed antibiotics to prevent infective endocarditis, exceeding the 8% observed by Sbricoli et al. (25).

CONCLUSIONS

Within the limitations of this study:

Antibiotics can be beneficial in several dental situations; however, antibiotic resistance may result in significant difficulties. The study noted a significant prevalence of antibiotic prescriptions by dentists in situations that may not necessitate exposing patients to the danger of antibiotic resistance. The facial swellings were the primary reason for antibiotic prescriptions, with amoxicillin being the most often recommended antibiotic by the dentists surveyed. Enhancing dentists' knowledge on the necessity of antibiotic prescriptions in dentistry will mitigate the overuse of antibiotics.

Acknowledgment

This study was supported by the College of Dentistry at Tishk International University, Erbil city / Iraq.

Authors' Contribution

Younus MS contributed to conceptualization, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing–original draft, writing–review and editing.

Ethical statement:

The protocol of this study was approved by the Research Ethical Committee at TIU (TIU. Dent. 12/28).

Conflict of interest

The author declares that there are no conflicts of interest regarding the publication of this manuscript.

Availability of data and materials: All data generated or analyzed during this study are included in this published article and its supplementary information files.

Declaration of Generative AI and AI-assisted technologies

The author declares that during the preparation of this work, the author used Grammarly software to edit and proofread the text. The author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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معدل وصف المضادات الحيوية من قبل أطباء الأسنان بعد خلع الأسنان: دراسة مقطعية في مدينة أربيل

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الملخص

الأهداف: هدفت الدراسة الحالية إلى بحث معدل قيام أطباء الأسنان بوصف المضادات الحيوية بعد عمليات خلع الأسنان، وتحديد المضاد الحيوي الأكثر وصفاً، ومعرفة المبررات الكامنة وراء وصف هذه المضادات.

المواد وطرائق العمل: أجريت دراسة مقطعية شملت 150 طبيب أسنان يعملون في المستشفيات الحكومية والخاصة في مدينة أربيل. تم جمع البيانات المتعلقة بممارسات وصف المضادات الحيوية بعد خلع الأسنان باستخدام استبيان مُنظَّم، وجرى تحليل البيانات وصفاً فيما يخص معدل تكرار وصف المضادات الحيوية، ودواعي الاستخدام، وأنواع المضادات الحيوية الموصوفة.

النتائج: أفاد ما يقرب من 77% من أطباء الأسنان المشاركين بأنهم يصفون المضادات الحيوية بعد إجراءات خلع الأسنان. وتبين أن تورم الوجه هو السبب الأكثر شيوعاً لوصف المضادات الحيوية (بنسبة 63%). كما كان "أموكسيسيلين" (Amoxicillin) هو المضاد الحيوي الأكثر وصفاً، حيث شكّل نسبة 65% من إجمالي الوصفات الطبية.

الاستنتاجات: تصف غالبية أطباء الأسنان المضادات الحيوية بعد عمليات الخلع، وكان السبب الرئيسي لذلك هو تورم الوجه، في حين كان "أموكسيسيلين" هو المضاد الحيوي الأكثر استخداماً.

الكلمات المفتاحية: مضادات حيوية، أموكسيسيلين، طبيب أسنان، خلع.