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Original article

Trends in Prescribing Systemic Antibiotics by Libyan Dentists and Periodontists

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ABSTRACT

Antibiotic prescription is a common practice in everyday dentistry. Although antibiotics play a crucial role in managing periodontal disease, the threat of antibiotic resistance is an issue that requires more exploration. The aim of this study was to describe the patterns of prescribing systemic antibiotics treating periodontal and peri-implant diseases among Libyan dentists and periodontists. An online cross-sectional survey was designed to investigate the patterns and perspectives of antibiotic prescription. Indication parameters and timing of prescription that were analysed included: chronic gingivitis, chronic periodontitis, aggressive periodontitis, acute gingival and periodontal conditions, periodontal surgery, implant placement surgery, peri-implantitis treatment, and antibiotic prophylaxis for infective endocarditis. Out of the 3000 registered Libyan dentists, only 181 participated in the study. Systemic antibiotic prescription patterns varied markedly for different periodontal or peri-implant diseases among respondents. 72.29% of the respondents reported prescribing systemic antibiotics for the treatment of aggressive periodontitis, while 34.93% prescribed them for chronic periodontitis, 10.24% for chronic gingivitis, 71.15% for periodontal surgery, 64.64% for implant placement surgery, and 67.95% for peri-implanttitis treatment. The most commonly prescribed systemic antibiotics were amoxicillin, the combination of amoxicillin with metronidazole, and clavulanate potassium. This study revealed a high prevalence of overuse and misuse of systemic antibiotics in dental practice. Furthermore, it emphasizes the necessity of improving antimicrobial resistance awareness among Libyan dentists and incorporating antimicrobial stewardship.

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INTRODUCTION

Antibiotics have a crucial role in preventing and treating advanced health conditions. The improper prescription of antibiotics may induce adverse drug responses and favor the growth of opportunistic bacteria and antibiotic-resistant bacteria. Antimicrobial resistance is a global problem that represents a serious risk to public health that results in prolonged disease duration, greater death rates, and higher treatment costs [1]. An estimated 700,000 people each year pass away from illnesses resistant to antibiotics. The number could rise to 10 million by 2050 [2]. Multiple resistant organisms have significantly increased as a result of the extensive use and overuse of antibiotics in medicine and dentistry, allowing resistance genes to be transmitted between bacteria [3].

Many studies reported that 6.5-11% of prescribed antibiotics were by dentists [4-8]. There is well-documented evidence of the inappropriate use of antibiotics among dentists as they often provide empirical antibiotic therapy, using broad-spectrum antibiotics that may increase the likelihood of resistant strains emerging and contribute to increasing antibiotic resistance [9, 10].

Periodontics has been ranked third in dentistry, both overall and per practitioner, for prescriptions written [11]. Even though scaling and root planing are considered the gold standard of non-surgical therapy for treating periodontitis, systemic antibiotics are used as an adjunctive to periodontal therapy and following mechanical debridement to target persistent subgingival microorganisms in some severe and acute periodontal diseases. Furthermore, it can be used following surgical periodontal therapy.

There has been research on a variety of systemic antibiotics for the treatment of periodontal and peri-implant diseases, with varying degrees of success in terms of clinical outcomes. According to the findings of systematic reviews conducted by Herrera et al. and Haffajee et al. [12,13] and systematic analysis of the Cochrane Library [14] there is widespread agreement regarding the additional benefit of systemic antibiotics on periodontal debridement regarding clinical parameters as a statistically significant reduction in probing depth and clinical attachment level gain. When systemic antibiotics were provided in addition to surgical periodontal therapy in deep pockets, a systematic review by Haffajee et al. reported a clinical benefit in the form of an increase in attachment level [13]. However, Herrera et al. concluded that insufficient information exists to determine the efficacy of adding systemic antibiotics to surgical periodontal therapy [12].

Numerous investigations were conducted in different nations to assess the prescribing practices of systemic antibiotics by general dentists and periodontists for treating periodontal conditions [15-21]. Nevertheless, there is a scarcity of studies regarding suggested clinical protocols for the use of systemic antibiotics in periodontal treatment [22]. This study aimed to describe the patterns and perception of antibiotic usage in periodontal therapy among Libyan general dentists and periodontists.

METHODS

Study sample

An online, cross-sectional survey was designed to investigate the patterns of antibiotic prescription by general dentists, periodontists and other specialists. Additionally, their perspectives regarding the prescription of systemic antibiotics for periodontal/peri-implant disease were examined. The study was conducted by sending an online survey questionnaire to Libyan dentists in Benghazi from May to September 2024. The participants were approached via Facebook and WhatsApp dental groups. However, only 181 participants contributed and responded to the study. Although the questionnaire was designed to be anonymous, it did contain information on the participants' demographics and graduation university.

Questionnaire

The questionnaire was a modification of that described by Alex et al [16]. The design aimed for clear questions with simple tick box responses. It consisted of 18 multiple-choice questions. The first part of the questionnaire included participants' demographic features: gender, place of graduation, years of clinical experience, as well as main practice (general dentistry, periodontology, or other dental specialty). The second part was about the use of systemic antibiotics for a range of prevalent clinical periodontal and peri-implant diseases. These diseases included plaque-induced gingivitis, chronic periodontitis, aggressive periodontitis, periimplantitis, acute gingival and periodontal infections. Also, the timing and rationale behind prescribing systemic antibiotics (Either as therapeutic or as a prophylactic measure prior to or following implant placement and periodontal surgery). The third part investigates the most commonly prescribed systemic antibiotic regimen by the participants (whether it is monotherapy or combination therapy) as well as the most commonly used type of tetracycline. The last two sections consist of questions regarding factors that influence antibiotic prescribing and dental procedures that require antibiotic prophylaxis for infective endocarditis.

Data analysis

Data were fed to PC and reviewed for any errors. The number and percentages of respondents were determined for each question. Categorical variables were reported as percentages. The data were displayed as tabular and graphical presentations. Regarding, inferential statistics, Fischer's exact test was used to assess the association between the general frequency of antibiotics prescription for different periodontal diseases and acute periodontal conditions and the following variables; gender, years of experience, place of graduation and specialty. Also, the association between the general frequency of antibiotics prescription following surgical procedure and the following variables; gender, years of

experience, place of graduation and specialty. Furthermore, the association between the frequency of most common antibiotics' regime prescribed and specialty was also analyzed. The level of significance was set at $p < 0.05$. All analyses were performed using Statistical Package for Social Science (SPSS), version 25.00.

RESULTS

Based on online and written Questionnaire, out of 3000 potential responders including periodontists, other specialists and general dental practitioners only 181 responded to the questionnaire (with response rate of 6.033%). The response was higher in the following groups: female dentists, graduates from university of Benghazi, general practitioners and those with higher years of clinical practice >10 years.

Demographic characteristics of the responders in the study

181 responders 42 (23.2%) males, 139 (76.8%) females were included. The demographics characteristics of the respondents are shown in table 1.

Table 1. Demographic Characteristics of the Respondents

Number of Respondents		Numbers (181)	Percentage
Gender	Male	42	23.2%
	Female	139	76.8%
	(M/F) Ratio	23.2%/ 76.8%	
Education	UOB	150	82.87%
	Others	31	17.13%
Specialities	GDP	124	68.51%
	Periodontist	12	6.63%
	Other Specialist	45	24.86%
Years of Clinical Practice	< 5 Years	53	29.28%
	5-10	44	24.31%
	> 10 Years	84	46.41%

Indications of prescription of systemic antibiotic in the main periodontal diseases

A 166 of respondents (91.21%) were prescribing systemic antibiotics for treating the main periodontal diseases (Table.2). The indication pattern was 72.29% in aggressive periodontitis, 34.93% in chronic periodontitis, 10.24% in gingivitis. No statistically significant difference between the subgroups in the demographic groups (p>0,05).

Periodontal surgical treatment

Only 33.73% of the respondents were performing periodontal surgical treatment where 71.15% of them reported the use of systemic antibiotic after periodontal surgery (Table 2). No statistically significant difference between the subgroups of the demographic groups {gender (p=1.00), dental specialties (p=0.350) and clinical experience (p=0.688), p>0.05}. Dentists graduated from Benghazi University demonstrated a higher proportion of prescription pattern of systemic antibiotic after surgical treatment (78.4%) compared to dentists graduated from other universities (21.6%) with a statistically significant difference (p= 0.044*, p<0.05).

Implant placement surgery

A 117 of the respondents prescribed antibiotics with implant placement surgery with varies protocol (Table 2). A 30.89% of respondents reported the prescription of antibiotic for one week after insertion where the prophylactic dose protocol was prescribed by 29.27% of respondents. Both protocols were found prescribed in 39.84% of the respondents (Figure 1).

Peri-implantitis treatment

Systemic antibiotics were used for the treatment of peri-implantitis in 117 of the respondents (64.64%). The highest rate of antibiotic prescription (46.15%) found only in the presence of all parameters: suppuration, radiographic marginal bone loss (RMBL) and bleeding on probing (BOP). Then followed by the presence suppuration (40.17%) either alone (37.6%) or in conjunction with bleeding on probing (1.7%) or with radiographic marginal bone loss (0.9%). Bleeding on probing was the least indication for antibiotic prescription (8%) either alone or in conjunction with either parameter

(RMBL or suppuration) as (0.9%, 1.7% respectively) (Table2 & 3).

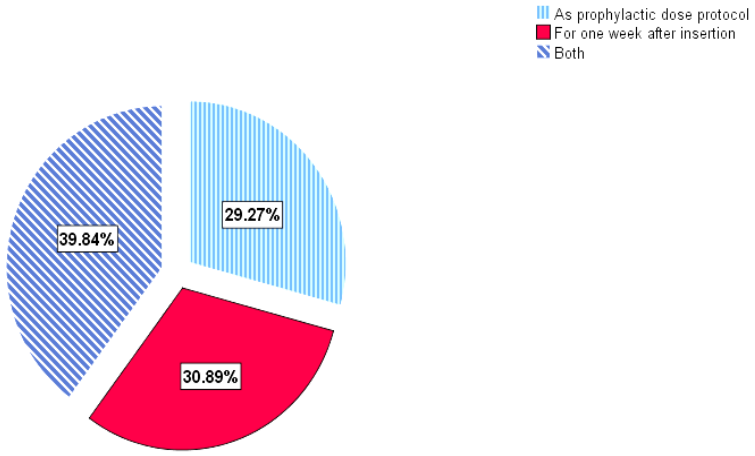

Figure 1. Distribution of the respondents according to their prescription protocol of systemic antibiotics in implant placement

Table 2. Distribution of Dentists According their Indications of Prescribing Systemic Antibiotic for Periodontal Therapy.

Indications of Prescription of Systemic Antibiotic in Periodontal Therapy	Numbers	Percentage
Chronic Gingivitis	17/166	10.24
Chronic Periodontitis	58/ 166	34.93
Aggressive periodontitis	120/166	72.29
ANUG/ NUP	93/107	86.92
Acute gingival abscess	67/100	67.00
Acute periodontal abscess	91/112	81.25
Pericoronitis	88/104	84.62
Peri-implantitis	53/78	67.95
Periodontal surgical treatment	37/52	71.15
Implant Placement surgery	117/181	64.64
Prophylactic Antibiotics for infective endocarditis	163/181	90.06

Timing of prescription

A 158 of the respondents reported different timing patterns in prescribing systemic antibiotics for treating periodontal diseases. The majority of the respondents 63.92% (101/158) prescribed systemic antibiotics after the first visit of scaling, while 14.56% (23/158) prescribed them after the end of scaling (Table 3). About 21.52% of respondents (34/158) prescribed systemic antibiotics before starting scaling with majority in general practitioners and higher than 10 years of clinical experience.

Acute periodontal diseases

The respondents demonstrated high rate of antibiotic prescription in treating different acute periodontal conditions as (86.92%) in treating ANUG or NUP, (67.00%) in treating acute gingival abscess, (81.62%) in acute periodontal abscess, (84.62%) in treating pericoronitis and (67.95%) in treating peri-implantitis (Table 2). A 78.82%of the respondents would only prescribe systemic antibiotics only when there was systemic involvement (Table 3). No statistically significant difference between the subgroups of the demographic groups {gender, education, dental specialties and clinical experience) regarding antibiotic prescription for treatment of acute periodontal conditions ($p>0.05$).

Prophylactic antibiotics for infective endocarditis

Prophylactic antibiotics against infective endocarditis for high-risk group patients was indicated by the respondents' prior dental procedures that involving the manipulation of gingival tissues (4.29%), and periapical region of teeth (3.07%), any perforation of oral mucosa (22.09%) and in all mentioned above (73.00%). (Table 3).

Table 3. Distribution of Dentists According to the Timing and when Prescribing Systemic Antibiotic for Periodontal Therapy.

Timing of prescription of systemic antibiotics in the main periodontal diseases	Numbers (158)	Percentage
Before you start scaling	34	20.5
After the first visit of scaling	13	7.8
After you finish scaling	23	14.6
Indication in Acute Periodontal Diseases	**Numbers (170)**	**Percentage**
When there is systemic involvement	134	78.82
When there is no systemic involvement	36	21.17
Indication in Peri-implantitis	**Numbers (117)**	**Percentage**
Suppuration	47	40.17
Radiographic bone loss	11	9.4
Bleeding on probing	8	6.84
All of them	54	46.15
Indication of Prophylactic Antibiotics for Infective Endocarditis	**Numbers (163)**	**Percentage**
Manipulation of gingival tissues	7	4.29
Manipulation of periapical region of teeth	5	3.07
Any perforation of oral mucosa	36	22.09
All the mentioned above	119	73.01

The most common antibiotic regime

Combined therapy of systemic antibiotics was the most common prescribed regime in 65.56% of the respondents where the monotherapy was prescribed in 34.44% (Table 4).

No statistically significant difference between the subgroups of the demographic groups {gender (p=0.), dental specialties (p=0.588) and clinical experience (p=0.519), p>0.05}.

Table 4. Distribution of Dentists According the Kind of Mostly Prescribed Systemic Antibiotics The text

Most Combined antibiotics regime	Numbers	Percentage
Monotherapy	52/151	34.43
Combined therapy of antibiotics	99/151	65.56
Most common kind of monotherapy antibiotics	**Numbers**	**Percentage**
Amoxicillin	107/153	69.93
Metronidazole	12/153	7.84
Tetracycline	20/153	13.07
Azithromycin	4/153	2.61
Others	14/153	9.15
Most common kind of combined antibiotics	**Numbers**	**Percentage**
Amoxicillin & Metronidazole	79/157	50.32
Amoxicillin and clavulanate potassium (Augmentin)	77/157	49.04
Metronidazole and ciprofloxacin	1/157	0.64

Amoxicillin was the most commonly prescribed monotherapy of antibiotic regime in 69.93%of the respondent followed by tetracycline (13.07%), metronidazole (7.84%) and azithromycin (2.60%). Amoxicillin and metronidazole were the most commonly prescribed combined therapy of antibiotic regime in (50.32%) of the respondent with similar rate at (49.10%) for Augmentin and followed by metronidazole with ciprofloxacin (0.60%). No statistically significant difference between dental specialties regarding the most commonly prescribed combined therapy of antibiotics (p=0.284) (p>0.05}.

Among tetracyclines, 250 mg tetracycline every 6 hr was the most common regime in 62.66% of the respondents followed by doxycycline 100mg twice daily (32.00%) with the least prescribed minocycline 200 mg/day. 41.67% of the respondents were prescribing tetracycline capsule powder as mouthwash.

Factors of concern

Reviewing medical history was the major factor of concern in 76.6% of the respondents when it comes to prescribing systemic antibiotics. This was followed by antimicrobial resistance (38.59%), side effects and patient compliance (24.56%), anaphylaxis (23.98%) and cost (11.11%) (Table 5).

Table 5. Distribution of the Respondents According to Factors of Concern for Prescription of Systemic Antibiotics.

Factors of concern in Prescription of Systemic Antibiotic in Periodontal Therapy	Number (171)	Percentage
Reviewing medical history	131	76.61
Antimicrobial resistance	66	38.59
Side effects	42	24.56
Anaphylaxis	41	23.98
Patient compliance	42	24.56
Cost	19	11.11

DISCUSSION

Dentists prescribed antibiotics for both prophylactic and therapeutic purposes in several clinical situations, despite a lack of indication in the guidelines. Systemic antibiotics have been utilized in periodontics for three decades. However, limited data exists regarding the current prescribing patterns in treatment of different periodontal conditions. Clinical diagnosis is currently based on clinical experience rather than molecular pathology [23]. Our data indicate substantial variations among participants in prescription regimens, particularly between periodontists and other groups.

Our research demonstrates that the use of systemic antibiotics is more frequent when treating periodontal conditions. 72.29% of the participants use systemic antibiotics as an adjunct to mechanical debridement in cases of aggressive periodontitis, 34.93% use them to treat patients with chronic periodontitis. However, 10.25% of our respondents unjustifiably use systemic antibiotics to treat chronic gingivitis. Still, it is lower than previously documented [18, 21]. These results were greater than reported by dental practitioners in the similar studies worldwide [15, 19, 20, 24]. As they showed a lower use of systemic antibiotics in the treatment of chronic and aggressive periodontitis compared to our study. In contrast another two studies revealed great percentage of systemic antibiotics usage in the treatment of chronic and aggressive periodontitis (79% and 89% versus 77% and 92.7%) respectively [16, 21].

Our results were considered consistent with the literature [12, 22, 25]. According to a recent systematic review, using antibiotics as an adjuvant to non-surgical debridement statistically reduces probing depth and increases clinical attachment level gain. The clinical benefits persisted for a year [14]. Nonetheless, Haffajee et al. [2003] concluded that patients diagnosed with aggressive periodontitis showed more benefit from mechanical debridement with systemically antibiotics than those with chronic periodontitis [13]. However, the scientific evidence that is now available does not justify the indiscriminate administration of any antibiotic to any patient [26]. Moreover, Morbilli et.al [2011] came to the conclusion that we can and should treat mild cases without the use of antibiotics. We should assess and revise the initial therapy plan based on a clinical reexamination after 3 to 6 months [27].

Regarding the timing of systemic antibiotic use, nearly 22% of the practitioners used antibiotic before they started scaling which indicates misuse of systemic antibiotics. More than half of them after the first visit of periodontal treatment. Only 15% initiated the use of adjunct antibiotics after the completion of mechanical debridement. Literature indicates a variation in the timing of antibiotic prescription patterns, either at the beginning of scaling and root planing ranging from 34.75% to 76.7%; or at the completion of treatment (23.98%, 14.58%) [16, 20].

It was recommended that antibiotics should be applied as adjuncts to mechanical instrumentation only on the day of periodontal debridement completion, it is crucial to perform debridement quickly (preferably less than a week) and with adequate quality [26].

In this study, dentists prescribed antibiotics in 87% of necrotizing ulcerative gingivitis cases, 67% for gingival abscess, and 84.6% for pericoronitis. This indicates a lack of awareness among our practitioners, as it is the greatest percentage documented in the previous studies [10, 16, 18, 19, 28]. Necrotizing periodontal diseases may be treated at first with a chlorhexidine mouthrinse, limited mechanical hygiene, and ultrasonic or sonic instruments for superficial cleaning. When there is systemic involvement, we may justify the use of systemic antibiotics.

Additionally, the most recent evidence-based guidelines for treating pericoronitis, published in 2022, stated that local interventions like debridement and irrigation can manage most cases [29].

Following the same guideline, the main treatments for and periodontal abscesses include incision, drainage, and debridement. This aligns with our findings, since 78.8% of dentists would use systemic antibiotics for the treatment of acute periodontal abscesses only in cases of systemic involvement (fever and/or malaise) or when local treatment yields inadequate results. Antibiotic regimens of 3 to 5 days are probably as effective as 7-day courses [30]. To maximize benefits and minimize the likelihood of antibiotic adverse effects [31].

Prophylactic use of systemic antibiotics has accompanied surgical procedures or implant placement. Systematic reviews revealed conflicting results [13, 22, 32-33]. A significant portion of dentists (71.15%) who perform these procedures

use prophylactic antibiotics. Some clinicians may rely on antibiotics to lower the risk of unfavorable surgical outcomes, especially when they have limited experience. There is a statistically significant difference between University of Benghazi (UOB) graduates and other graduates in prescribing of systemic antibiotic following surgical treatment (78.4% vs 21.6 %).

It was observed that 59.38% of UOB participants are periodontists and other dental specialists who treat more complex cases and practice more sophisticated surgical therapies. On the other hand, all other universities respondents are general dental practitioners with less clinical experience (71.43% less than 5 years, and 28.57% with 5-10 years of clinical experience) which means practicing minor soft tissue surgeries that does not require antibiotic coverage.

Experts have recommended various pre- and postoperative antibiotic regimens to prevent postoperative infection and subsequent early implant loss [34]. Research involving populations from different nations also reveals a preference for prescribing the complete antibiotic course as opposed to antibiotic prophylactics alone [15, 16, 35].

In our study, 29% of participants used a prophylactic dose of systemic antibiotics before implant insertion, 30.8% received antibiotic prescriptions for one week after implant placement, and the final third used both a prophylactic dose and an extended course for one week. However, this topic remains controversial in the literature. A report from the European Association of Osteointegration (EAO) stated that antibiotic prophylaxis is beneficial in complex cases such as grafting procedures, immediate implant placement, and/or patients with systemic complications [36]. Instead, practitioners should follow antimicrobial stewardship standards and avoid routinely giving antibiotics to healthy patients. It is important to mention that our questionnaire does not distinguish between single or multiple implants or the patient's medical state. As a result, we may have exaggerated the final results.

About half of the respondents (46.2%) use systemic antibiotics to treat periimplantitis when all signs are present (BOP, suppuration, radiographic marginal loss) which conforms with the evidence-based summary of peri-implantitis for the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions [37]. While 37.6% would use it in the presence of suppuration only.

The 2023 guidelines from the European Society of Cardiology (ESC) and the 2021 guidelines from the American Heart Association (AHA) strongly recommend that high-risk patients take antibiotics before invasive dental procedures, like dental extractions, and procedures that involve surgical manipulation of the gingiva and of the periapical region [38, 39]. The majority of our survey participants (73%) adhere to these guidelines. In this study, 34% of the participants prescribed one type of systemic antibiotics (monotherapy) to treat any periodontal or peri-implant disease. In contrast, two-thirds used a combination regime. Despite similar outcomes across various groups, the periodontist (77.7%), another specialist (60%), and GDP (60%) favored combination therapy. Amoxicillin was the most often prescribed antibiotic at 69.9%, and this finding is consistent with the literature [10, 18, 19, 21, 40]. They are recommended for the treatment of acute periodontal infections [40]. Followed by tetracycline at 13%, metronidazole at 7.8% and azithromycin at 2.6%. Tetracycline is a broad-spectrum bacteriostatic antibiotic. Moreover, it has an anti-collagenase activity that helps stop tissue deterioration. Systemic tetracycline was used to treat localized juvenile periodontitis. Nevertheless, it did not stop further deterioration of the periodontal attachment [41]. There have been reports of tetracycline resistance in the oral microbiota due to the widespread usage of tetracyclines in the past [42, 43].

Both doxycycline and minocycline are second-generation tetracycline antibiotics that have the same antibacterial ranges and similar molecular structures. Still, they exhibit superior patient compliance due to the advantages of a once or twice daily dosage. When it comes to our dentist preference of prescribing different doses of tetracycline (62.2%), doxycycline (32%) and minocycline (5.33%) they did not use this advantage. And this could be due to their poor knowledge to the update of the literature.

Systemic doxycycline has long been utilized as an adjuvant to scaling and root planing in diabetic patients. However, a recent study found no significant difference in clinical attachment levels for periodontal states or a reduction in HbA1c levels in the treatment of diabetes patients with periodontitis [44]. Surprisingly, 41.67% of dentists reported using tetracycline capsule powder as mouthwash. One reason could be a clinical practice based on personal experience not supplied through guidance from evidence-based guidelines.

It was reported that metronidazole produced superior outcomes in individuals with localized aggressive periodontitis than tetracycline. It also reduced the quantity of teeth requiring periodontal surgery [45]. The results were maintained on the 6-year follow-up [46]. Metronidazole was reported as the most common antibiotic used in the treatment of necrotizing gingivitis [18]. However, it was rarely prescribed and this may owe to its potential adverse effects on patients.

Recent research highlights the benefits of azithromycin over other antibiotics, such as its simple three-day dosage, minimal adverse effects, and rapid reduction in the bacterial burden of infected sites [47]. Only 2.6% of dentists in the survey would choose to describe azithromycin in periodontal treatment. A study in Zagreb observed a similar trend [19].

Conversely, it was the most commonly prescribed systemic antibiotic for management of chronic periodontitis, aggressive periodontitis, and periimplantitis in Australian survey [16]. Even though other researches displayed conflicting results [48, 49].

In order to minimize the threat of bacterial antimicrobial resistance. Researchers have suggested using two antibiotics with synergistic effects at high doses for short periods of time [50]. According to reports, the most popular combination antibiotic regimen is metronidazole and amoxicillin [51]. with superior results compared to scaling and root planning alone in individuals with mild to advanced periodontitis [52]. and generalized aggressive periodontitis [53]. Our results revealed that 50.3% of the questionnaire respondents utilized a combination of amoxicillin and metronidazole. 49.1% admitted using amoxicillin with clavulanic acid (augmentin), which agrees with the findings from the previous study [19]. Explanation to this may return to the potential for amoxicillin to become increasingly ineffective against bacteria due to overuse and misuse both by the practitioners and the patients. Particularly in our nation, antibiotics are readily accessible over-the-counter.

A negligible proportion (0.6%) prescribed a combination of metronidazole and ciprofloxacin. This combination has been investigated. as an adjunctive to mechanical therapy in a clinical study that involved patients with aggressive periodontitis, it exhibited satisfactory results. It has substantial effects on the clinical parameters of periodontal disease and the elimination of A. actinomycetemcomitans from periodontal tissues [54]. No evidence suggests that the impact of systemic antimicrobials varies between patients with aggressive and chronic periodontitis [26].

In order to prevent the overuse and misuse of antibiotics, it is important to consider a number of factors prior to initiating therapy. These encompass the clinical indications for antibiotic administration, the patient's oral health status, and the current condition of their medications. And, if it is feasible, a microbiological test to accurately assess the risk/benefit ratio associated with the systemically delivered administration of antibiotics. Additionally, it is advisable to administer a narrow-spectrum antibiotic for the minimum possible duration, and the patient should be monitored throughout the treatment.

According to our respondents, the most critical variables to consider when prescribing antibiotics are the patient's medical history (76.61%) and antimicrobial resistance (38.59%). Equal percentages were concerned about patient compliance and adverse effects (24.56%). Only (11.11%) of the dentists have voiced concerns about the antibiotic's cost. These findings reflect poor knowledge of our dentist as they are not aware about antimicrobial resistant. Besides, patient behaviors, such as non-adherence to treatment and non-medical prescriptions, may negatively affect the antimicrobial resistance phenomenon. Australian research has shown that almost 82% are concerned about antimicrobial resistance, 76% care about side effects, and 53% are concerned about patient compliance [16]. The European Workshop on Periodontology have established a clinical practice guideline for the treatment of stages I-III periodontitis and stage IV periodontitis at the S3 level in [55,56]. Their advised was against the routine use of systemic antibiotics as an adjuvant to subgingival debridement in patients with periodontitis. In certain patient categories, such as young individuals with stage III periodontitis, additional use of specific systemic antibiotics may be considered. We recommend establishing clear, detailed standards for antibiotic prescribing to facilitate case selection and enhance usability. These guidelines require a comprehensive discourse on indications and regimens. Following implementation, it is essential to routinely evaluate compliance with these clinical criteria. It is important that clinicians carefully consider the rationale for antibiotic use and balance this against alternative treatment approaches based on evidence, guidelines, and best practices [40].

CONCLUSION

This study revealed a high prevalence of overuse and misuse of systemic antibiotics in dental practice. Furthermore, it emphasizes the necessity of improving antimicrobial resistance awareness among Libyan dentists. Dental practice and oral healthcare must thoroughly incorporate antimicrobial stewardship. Furthermore, it is crucial to enhance education and training for practitioners to improve antibiotic administration, thereby reducing unnecessary prescriptions, and to increase patients' adherence to antimicrobial treatment, thereby preventing non-medical prescriptions from being prescribed.

Conflict of interest. Nil

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اتجاهات في وصف المضادات الحيوية الجهازية من قبل أطباء الأسنان وأخصائيي أمراض وعلاج اللثة الليبيين

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الملخص

وصف المضادات الحيوية ممارسة شائعة في طب الأسنان اليومي. على الرغم من أن المضادات الحيوية تلعب دورًا حاسمًا في علاج أمراض اللثة و دواعم الأسنان وحول الزرعات السنية، فإن تهديد مقاومة المضادات الحيوية هو قضية تتطلب المزيد من الاستكشاف. تهدف هذه الدراسة إلى وصف أنماط وصف المضادات الحيوية الجهازية لعلاج أمراض وحالات اللثة و دواعم الأسنان وحول الزرعات السنية بين أطباء الأسنان وأخصائيي أمراض وعلاج اللثة الليبيين. تم تصميم دراسة استقصائية مقطعية عبر الإنترنت للتحقيق في أنماط ووجهات النظر في وصف المضادات الحيوية. وشملت معايير المؤشرات وتوقيت الوصف التي تم تحليلها: إلتهاب اللثة المزمن، إلتهاب دواعم السن المزمن، التهاب دواعم السن العدواني، التهابات اللثة و دواعم السن الحادة، جراحة اللثة ودواعم الأسنان، جراحة وضع الزرعات السنية، علاج إلتهاب محيط الغرسة، والوقاية بالمضادات الحيوية لإلتهاب الشغاف المعدي. ومن بين 3000 طبيب أسنان ليبي مسجل، شارك 181 طبيبًا فقط في الدراسة. وتباينت أنماط وصف المضادات الحيوية الجهازية بشكل ملحوظ بين المستجيبين. وأفاد 72.29٪ من المستجيبين بوصف المضادات الحيوية الجهازية لعلاج إلتهاب دواعم السن العدواني، بينما وصفها 34.93٪ لإلتهاب دواعم السن المزمن، و10.24٪ لإلتهاب اللثة المزمن، و71.15٪ لجراحة اللثة ودواعم السن، و64.64٪ لجراحة وضع الزرعة السنية، و67.95٪ لعلاج إلتهاب محيط الزرعة السنية. كانت المضادات الحيوية الجهازية الأكثر وصفًا هي الأموكسيسيلين، ومزيج الأموكسيسيلين مع الميترونيدازول، ومزيج الأموكسيسيلين وكلافولانات البوتاسيوم. كشفت هذه الدراسة عن انتشار كبير للاستخدام المفرط للمضادات الحيوية الجهازية وإساءة استخدامها في ممارسة طب الأسنان. وعلاوة على ذلك، تؤكد على ضرورة تحسين الوعي بمقاومة مضادات الميكروبات بين أطباء الأسنان الليبيين ودمج إدارة مضادات الميكروبات .

الكلمات الرئيسية: أطباء الأسنان، التهاب اللثة، المضادات الحيوية الجهازية، مقاومة المضادات الحيوية