



Evaluation of the Level of Knowledge and Awareness of Dentists about the Use of Antibiotics in Periodontal Treatment

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Abstract

Aim: Antibiotics are widely used in dentistry and are essential in periodontal treatment. The purpose of the study is to evaluate dentists' knowledge and awareness levels about the use of antibiotics in periodontal therapy and to find out in which cases they prescribe antibiotics to their patients.

Material and Methods: The participants consisted of 150 volunteer dentists. They were asked to fill in the questionnaire that consisted of related questions. Chi-square and Fisher's exact tests determined the relationship between categorical variables. Statistical significance level $p < 0.05$ was accepted as significant.

Results: The study included 105 (67.7%) female and 50 (32.3%) male participants. It was revealed that the antibiotics most prescribed by dentists in periodontal treatment procedures were amoxicillin-clavulanic acid (80%) and metronidazole (57%). A statistically significant correlation was observed between the dentists' "expertise/doctoral status" and the question "Prescribing antibiotics" in the tooth surface cleaning and root surface straightening, crown lengthening, crest augmentation, and sinus lifting procedures. After periodontal surgical procedures, they mostly preferred to use antibiotics for 5 (23.4%) and seven days (24%) after the process. The study also argued that most participants prescribed antibiotics in addition to non-surgical mechanical therapy, believing that it improves clinical outcomes (70.5%) and reduces post-operative complications (70.5%).

Conclusion: The findings of the study suggest that dentists need to be more aware of the use of antibiotics in periodontal treatment procedures.

Keywords: Survey study, antibiotic usage, periodontal treatment

INTRODUCTION

The development of periodontal diseases is associated with subgingival bacterial colonization and biofilm formation, which causes chronic inflammation of soft tissues, destruction of tooth-supporting collagen fibers, and resorption of alveolar bone (1). Simultaneously, bacterial plaque is shown as the primary etiological agent of periodontal diseases (2). Today, periodontal therapy emphasizes the suppression or destruction of specific periodontal pathogens in the mouth and the regeneration and maintenance of periodontal health-related microbial flora (3). Conventional non-surgical periodontal treatment involves mechanical debridement, including tooth surface cleaning and root surface straightening. It is associated with clinical recovery, suppression of periodontopathogens, and recolonization of the biofilm

with host-compatible beneficial species (4). The findings of the study suggest that dentists need to be more aware of the use of antibiotics in periodontal treatment procedures

Antibiotics are widely used in dentistry, and these drugs have an essential place in periodontal treatment (5,6). Systemic antibiotics are widely used in periodontal therapy in addition to mechanical therapy (scaling-root planning) with their ability to destroy soft tissue-invasive pathogens and inhibit microorganisms in hard-to-reach areas. It is also known that systemic antibiotics and scaling-root planning (SRP) significantly increase clinical attachment gain and contribute to maintaining gained periodontal health for extended periods (7).

There is widespread concern about the overuse of antibiotics and the emergence of resistant strains of

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bacteria. Several features characterize antibiotic use in dentistry. Worldwide, antibiotic use in dentistry is characterized by empirical prescribing based on clinical factors and previously known bacteriological epidemiology (8,9). As a result, broad-spectrum antibiotics are widely used, and resistance development of oral microorganisms has increased (5,10). For example, β -lactamase-producing microorganisms are isolated from patients treated with β -lactam antibiotics (11). A similar pattern of resistance has been reported for *Streptococcus viridans* (a pathogen commonly isolated in dental infections) to macrolides, penicillin, and clindamycin (12). In addition to the development of resistance, side effects (including gastrointestinal, allergic, and hematological reactions) are other problems of antibiotic use. For this reason, the rational use of antibiotics in dentistry is essential in terms of reducing the development of resistance and side effects in oral pathogens and increasing their effectiveness (13). Conversely, informing patients about the antibiotics prescribed is important. This information should include doses and dose ranges, drug side effects, drug interactions, storage conditions, and the price of prescribed drugs. This avoids misunderstanding of the information provided. On the other hand, the completeness of the information to be given to the patient will increase the success rate of the treatment, the patient's compliance, quality of life, and cost-effectiveness (14).

There have been limited studies of dentists prescribing antibiotics in periodontal treatment procedures, which have varied widely in what is prescribed (5,6). Our study aims to evaluate the knowledge and awareness levels of dentists about the use of antibiotics in periodontal treatment and to learn when they prescribe antibiotics to their patients.

MATERIAL AND METHOD

This research is a descriptive epidemiologic survey study. The study was conducted between January 2022 and February 2022. The study protocol was approved by the Research Ethics Committee of Recep Tayyip Erdoğan University; Date:09.05.2022, Number 2023/116.

A total of 155 voluntary participants, 105 female and 50 male dentists, who were informed about this study in detail and agreed to participate, were included.

Statistical Analyses

The sample size of this study was calculated using the G*Power statistical program (ver.3.1.9.7). The 11-question questionnaire form, which was prepared with Google Forms after reviewing the relevant literature on the subject, was sent to dentists, doctoral/specialty students, and specialist dentists via various social media (WhatsApp, Gmail, etc.) to be filled out online. In the first part, to determine demographic data, questions were asked about professional experience, gender, the institution of employment, and specialty/doctoral education. In the second part, questions were asked to determine the frequency/tendency of antibiotic prescription in periodontal treatment procedures, frequency of antibiotic

prescription in periodontal findings/patient types, type of antibiotic prescribed, frequency of use, and reason for prescribing antibiotics.

In addition, questions were asked to find out whether the physicians prescribe antibiotics to patients in non-surgical mechanical treatment, including tooth surface cleaning and root surface smoothing, and if so, with which protocol they prescribe antibiotics, the tendency to prescribe antibiotics in surgical procedures, and the antibiotic prescription protocol. The necessary Institutional Approval Certificate was obtained for the study.

This study determined descriptive variables such as professional experience, gender, education, and institution of employment. In our research, the professional experience of the participants was categorized as 1-5 years, 6-10 years, 11-15 years, and >15 years, and the educational status was categorized as a general dentist, specialty/doctorate in periodontology, specialty/doctorate in another branch, specialty/doctorate in periodontology and specialty/doctorate in another branch. Participants were divided into three groups: private practice/polyclinic, Oral and Dental Health Center, or other public institutions and university employees.

The criteria for inclusion in the study were to be a dentist/specialty student/doctoral student/specialized dentist and to have approved the voluntary consent form for the study.

In calculating the sample size of this study, the power (power of the test) for each variable was at least 80%, and the type 1 error was 5%. Descriptive statistics for categorical variables in our study were expressed as numbers (n) and percentages (%). "Chi-square" and "Fisher's exact" tests determined the relationship between categorical variables. The statistical significance level was taken as 5%, and the SPSS (IBM SPSS for Windows, ver.26) statistical package program was used for calculations.

RESULTS

A total of 155 people participated in the survey. Table 1 shows the general descriptive statistics of the demographic data of the physicians. Accordingly, the majority of the participants (67.7%) were female; the majority (63.2%) had 1-5 years of experience; 56.1% worked in universities; and the majority (30.3%) did not have a specialty/doctorate.

Table 2 shows the relationship and distribution between "specialty/doctoral status" and "the frequency of dentists prescribing antibiotics in procedures". According to this; A statistically significant correlation was observed between the dentists' question of "expertise/doctoral status" and "prescribing antibiotics in the procedure of tooth surface cleaning and root surface straightening" ($p<0.05$). Similarly; A statistically significant correlation was observed between the dentists' "expertise/doctoral status" and the question "Prescribing antibiotics in the crown lengthening procedure" ($p<0.05$). At the same time; a statistically significant correlation was observed

between the dentists' "expertise/doctoral status" and the question "antibiotic prescribing in the crest augmentation procedure" ($p < 0.05$). Finally; A statistically significant correlation was observed between the dentists' question of "expertise/doctoral status" and "prescribing antibiotics in the sinus lift procedure procedure" ($p < 0.05$). Despite that; Except for the questions mentioned above, no statistically significant relationship was observed between the questions "frequency of dentists prescribing other antibiotics" and "expertise/doctoral status".

Table 3 shows the relationship and distribution between "expertise/doctoral status" and "antibiotic prescribing frequency in periodontal findings/patient types". According to this; For all the questions in the table, no statistically significant relationship could be observed between "the frequency of antibiotic prescribing in periodontal findings/patient types" and "expertise/doctoral status" ($p > 0.05$). In other words; "These antibiotic prescribing frequency questions" do not differ "according to specialty/doctoral status".

Table 4 shows the relationship and distribution between "expertise/doctoral status" and "what type of antibiotics

and how often they prefer in periodontal findings/procedures". According to these results; A statistically significant correlation was observed between the dentists' "specialty/doctoral status" and the "frequency of clindamycin prescription" question ($p < 0.05$).

Similarly; A statistically significant correlation was observed between the dentists' "expertise/doctoral status" and the "frequency cephalosporin prescription" question ($p < 0.05$).

Also; A statistically significant correlation was observed between the dentists' question of "expertise/doctoral status" and "frequency of prescribing Erythromycin" ($p < 0.05$).

Finally; A statistically significant correlation was observed between the dentists' "expertise/doctoral status" and the "frequency of prescribing clarithromycin" ($p < 0.05$).

Despite that; Except for the questions mentioned above, no statistically significant relationship was observed between the questions "frequency of dentists prescribing other antibiotics" and "expertise/doctoral status" ($p > 0.05$).

Table 1. Demographic descriptive data of the participants

		N	%
Gender	M	50	32.3
	F	105	67.7
Professional experience	1-5 years	98	63.2
	6-10 years	37	23.9
	11-15 years	11	7.1
	>15 years	9	5.8
Working place	Oral and Dental Health Centre or other public institutions	45	29.0
	Private practice/polyclinic	23	14.8
	University	87	56.1
Specialty/doctorate status	No	47	30.3
	I received specialization/doctorate training in another branch	20	12.9
	I am studying for a specialty/doctorate in another branch	40	25.8
	I received specialty/doctorate training in periodontology	13	8.4
	I am studying for a specialty/doctorate in periodontology	35	22.6

Table 2. The relationship and distribution between "specialty/doctoral status" and "the frequency of dentists prescribing antibiotics in procedures"

		Specialty/doctoral status										*p.
		None		I received specialist/doctorate education in another branch		I am studying for a specialist/doctorate in another branch		I received a specialist/doctorate education in periodontology		I am studying for a specialist/doctorate in periodontology		
		N	%	N	%	N	%	N	%	N	%	
Tooth surface debridement and root surface straightening	Sometimes	5	26.3	0	0.0	4	21.1	2	10.5	8	42.1	.035
	Never	20	26.3	14	18.4	26	34.2	5	6.6	11	14.5	
	Rarely	22	36.7	6	10.0	10	16.7	6	10.0	16	26.7	
Frenectomy	Sometimes	6	28.6	1	4.8	8	38.1	2	9.5	4	19.0	.717
	Usually	1	14.3	1	14.3	2	28.6	1	14.3	2	28.6	
	Always	3	75.0	1	25.0	0	0.0	0	0.0	0	0.0	
	Never	22	27.5	12	15.0	17	21.3	7	8.8	22	27.5	
	Rarely	15	34.9	5	11.6	13	30.2	3	7.0	7	16.3	

*Chi-square, Fisher's exact tests

Table 2. The relationship and distribution between "specialty/doctoral status" and "the frequency of dentists prescribing antibiotics in procedures"												
Gingivectomy	Sometimes	8	42.1	1	5.3	6	31.6	1	5.3	3	15.8	.468
	Usually	3	25.0	3	25.0	3	25.0	1	8.3	2	16.7	
	Always	3	75.0	1	25.0	0	0.0	0	0.0	0	0.0	
	Never	18	24.0	13	17.3	17	22.7	7	9.3	20	26.7	
	Rarely	15	33.3	2	4.4	14	31.1	4	8.9	10	22.2	
Vestibuloplasty	Sometimes	11	47.8	3	13.0	6	26.1	1	4.3	2	8.7	.685
	Usually	6	23.1	5	19.2	9	34.6	2	7.7	4	15.4	
	Always	2	25.0	1	12.5	3	37.5	0	0.0	2	25.0	
	Never	17	30.9	6	10.9	12	21.8	7	12.7	13	23.6	
	Rarely	11	25.6	5	11.6	10	23.3	3	7.0	14	32.6	
Flap surgery	Sometimes	10	30.3	2	6.1	9	27.3	3	9.1	9	27.3	.478
	Usually	13	29.5	9	20.5	8	18.2	4	9.1	10	22.7	
	Always	4	25.0	3	18.8	2	12.5	0	0.0	7	43.8	
	Never	12	35.3	4	11.8	11	32.4	3	8.8	4	11.8	
	Rarely	8	28.6	2	7.1	10	35.7	3	10.7	5	17.9	
Crown lengthening	Sometimes	7	31.8	3	13.6	5	22.7	0	0.0	7	31.8	.026
	Usually	2	8.7	3	13.0	5	21.7	4	17.4	9	39.1	
	Always	1	10.0	0	0.0	3	30.0	0	0.0	6	60.0	
	Never	25	39.7	8	12.7	18	28.6	6	9.5	6	9.5	
	Rarely	12	32.4	6	16.2	9	24.3	3	8.1	7	18.9	
Resektive periodontal surgery (hemisection, root amputation)	Sometimes	11	36.7	4	13.3	7	23.3	2	6.7	6	20.0	.684
	Usually	10	26.3	5	13.2	9	23.7	3	7.9	11	28.9	
	Always	6	23.1	4	15.4	5	19.2	1	3.8	10	38.5	
	Never	9	32.1	3	10.7	11	39.3	2	7.1	3	10.7	
	Rarely	11	33.3	4	12.1	8	24.2	5	15.2	5	15.2	
Regenerative periodontal surgery (YDR)	Sometimes	12	35.3	4	11.8	8	23.5	2	5.9	8	23.5	.268
	Usually	9	25.0	6	16.7	9	25.0	6	16.7	6	16.7	
	Always	10	25.0	4	10.0	7	17.5	4	10.0	15	37.5	
	Never	9	34.6	4	15.4	11	42.3	0	0.0	2	7.7	
	Rarely	7	36.8	2	10.5	5	26.3	1	5.3	4	21.1	
Free gingival graft	Sometimes	10	33.3	3	10.0	7	23.3	1	3.3	9	30.0	.851
	Usually	12	30.8	6	15.4	10	25.6	4	10.3	7	17.9	
	Always	7	26.9	4	15.4	6	23.1	1	3.8	8	30.8	
	Never	10	26.3	5	13.2	12	31.6	6	15.8	5	13.2	
	Rarely	8	36.4	2	9.1	5	22.7	1	4.5	6	27.3	
Connective tissue graft	Sometimes	10	37.0	1	3.7	6	22.2	1	3.7	9	33.3	.822
	Usually	11	25.6	7	16.3	12	27.9	4	9.3	9	20.9	
	Always	8	27.6	5	17.2	6	20.7	2	6.9	8	27.6	
	Never	11	30.6	5	13.9	11	30.6	5	13.9	4	11.1	
	Rarely	7	35.0	2	10.0	5	25.0	1	5.0	5	25.0	
Implant surgery	Sometimes	10	38.5	1	3.8	7	26.9	2	7.7	6	23.1	.312
	Usually	14	32.6	6	14.0	11	25.6	3	7.0	9	20.9	
	Always	10	19.2	9	17.3	10	19.2	8	15.4	15	28.8	
	Never	6	31.6	3	15.8	8	42.1	0	0.0	2	10.5	
	Rarely	7	46.7	1	6.7	4	26.7	0	0.0	3	20.0	
Crestal augmentation	Sometimes	10	50.0	1	5.0	5	25.0	1	5.0	3	15.0	.024
	Usually	11	24.4	7	15.6	12	26.7	4	8.9	11	24.4	
	Always	11	19.0	9	15.5	11	19.0	7	12.1	20	34.5	
	Never	7	38.9	2	11.1	9	50.0	0	0.0	0	0.0	
	Rarely	8	57.1	1	7.1	3	21.4	1	7.1	1	7.1	
Sinus elevating operation	Sometimes	10	43.5	2	8.7	7	30.4	1	4.3	3	13.0	.042
	Usually	13	28.9	7	15.6	11	24.4	4	8.9	10	22.2	
	Always	10	16.9	8	13.6	12	20.3	8	13.6	21	35.6	
	Never	9	47.4	2	10.5	8	42.1	0	0.0	0	0.0	
	Rarely	5	55.6	1	11.1	2	22.2	0	0.0	1	11.1	

*Chi-square, Fisher's exact tests

Table 3. "The relationship and distribution between "specialty/doctoral status" and "antibiotic prescribing frequency in periodontal findings/patient types"												
		Specialty/doctoral status										*p.
		None		I received specialist/doctorate education another branch		I am studying for a specialist/doctorate in another branch		I received specialist/doctorate education in periodontology		I am studying for a specialist/doctorate in periodontology		
		N	%	N	%	N	%	N	%	N	%	
In gingivitis with more than 30% bleeding on probing	Sometimes	6	54.5	1	9.1	2	18.2	1	9.1	1	9.1	.056
	Usually	5	83.3	0	0.0	1	16.7	0	0.0	0	0.0	
	Never	18	20.5	14	15.9	23	26.1	11	12.5	22	25.0	
	Rarely	18	36.0	5	10.0	14	28.0	1	2.0	12	24.0	
If there is mobility	Sometimes	5	38.5	1	7.7	1	7.7	2	15.4	4	30.8	.776
	Usually	2	66.7	0	0.0	1	33.3	0	0.0	0	0.0	
	Never	27	29.3	11	12.0	27	29.3	6	6.5	21	22.8	
	Rarely	13	27.7	8	17.0	11	23.4	5	10.6	10	21.3	
If pocket depth is ≥5 mm and radiographic bone loss has reached the middle and apical third	Sometimes	11	32.4	8	23.5	4	11.8	2	5.9	9	26.5	.188
	Usually	5	33.3	3	20.0	3	20.0	1	6.7	3	20.0	
	Always	3	100.0	0	0.0	0	0.0	0	0.0	0	0.0	
	Never	17	27.9	6	9.8	22	36.1	4	6.6	12	19.7	
	Rarely	11	26.2	3	7.1	11	26.2	6	14.3	11	26.2	
In young patients with periodontitis with molar/incisional involvement	Sometimes	7	33.3	6	28.6	3	14.3	2	9.5	3	14.3	.123
	Usually	9	22.5	4	10.0	8	20.0	6	15.0	13	32.5	
	Always	4	25.0	2	12.5	4	25.0	2	12.5	4	25.0	
	Never	9	28.1	3	9.4	15	46.9	1	3.1	4	12.5	
	Rarely	18	39.1	5	10.9	10	21.7	2	4.3	11	23.9	
Necrotizing gingivitis/periodontitis	Sometimes	11	37.9	1	3.4	8	27.6	2	6.9	7	24.1	.969
	Usually	9	22.5	7	17.5	11	27.5	5	12.5	8	20.0	
	Always	9	30.0	4	13.3	7	23.3	3	10.0	7	23.3	
	Never	10	38.5	3	11.5	6	23.1	1	3.8	6	23.1	
	Rarely	8	26.7	5	16.7	8	26.7	2	6.7	7	23.3	
In the presence of a periodontal abscess	Sometimes	9	25.0	4	11.1	12	33.3	4	11.1	7	19.4	.856
	Usually	16	42.1	5	13.2	6	15.8	3	7.9	8	21.1	
	Always	8	32.0	4	16.0	4	16.0	3	12.0	6	24.0	
	Never	3	16.7	3	16.7	7	38.9	1	5.6	4	22.2	
	Rarely	11	28.9	4	10.5	11	28.9	2	5.3	10	26.3	
In the presence of pus draining from the periodontal space	Sometimes	6	20.7	5	17.2	7	24.1	3	10.3	8	27.6	.672
	Usually	11	40.7	4	14.8	5	18.5	2	7.4	5	18.5	
	Always	8	42.1	2	10.5	4	21.1	2	10.5	3	15.8	
	Never	7	18.4	3	7.9	16	42.1	3	7.9	9	23.7	
	Rarely	15	35.7	6	14.3	8	19.0	3	7.1	10	23.8	
Class 2 or 3 furcation defects	Sometimes	9	26.5	6	17.6	4	11.8	3	8.8	12	35.3	.091
	Usually	7	38.9	2	11.1	5	27.8	2	11.1	2	11.1	
	Always	3	60.0	2	40.0	0	0.0	0	0.0	0	0.0	
	Never	16	30.2	7	13.2	20	37.7	2	3.8	8	15.1	
	Rarely	12	26.7	3	6.7	11	24.4	6	13.3	13	28.9	
Diabetic patients	Sometimes	12	33.3	5	13.9	7	19.4	2	5.6	10	27.8	.242
	Usually	11	36.7	6	20.0	5	16.7	1	3.3	7	23.3	
	Always	1	25.0	0	0.0	1	25.0	2	50.0	0	0.0	
	Never	9	31.0	4	13.8	10	34.5	1	3.4	5	17.2	
	Rarely	14	25.0	5	8.9	17	30.4	7	12.5	13	23.2	

*Chi-square, Fisher's exact tests

Table 4. "The relationship and distribution between "specialty/doctoral status" and "which antibiotics and how often they prefer in periodontal findings/procedures"

		Specialty/doctoral status										*p.
		None		I received specialist/doctorate education another branch.		I am studying for a specialist/doctorate in another branch		I received specialist/doctorate education in periodontology		I am studying for a specialist/doctorate in periodontology		
		N	%	N	%	N	%	N	%	N	%	
Amoxicillin (Largopen, Alfoxil)	Sometimes	16	29.6	9	16.7	12	22.2	3	5.6	14	25.9	.934
	Usually	9	34.6	2	7.7	6	23.1	2	7.7	7	26.9	
	Always	1	33.3	0	0.0	1	33.3	0	0.0	1	33.3	
	Never	10	37.0	2	7.4	6	22.2	4	14.8	5	18.5	
	Rarely	11	24.4	7	15.6	15	33.3	4	8.9	8	17.8	
Amoxicillin + clavulanic acid (Klamoks, Augmentin, Croxilex etc.)	Sometimes	8	25.8	6	19.4	9	29.0	2	6.5	6	19.4	.184
	Usually	18	22.5	10	12.5	20	25.0	11	13.8	21	26.3	
	Always	7	43.8	1	6.3	3	18.8	0	0.0	5	31.3	
	Never	4	80.0	0	0.0	1	20.0	0	0.0	0	0.0	
	Rarely	10	43.5	3	13.0	7	30.4	0	0.0	3	13.0	
Metronidazole. ornidazole (Flagyl. Biteral. etc.)	Sometimes	21	34.4	7	11.5	14	23.0	7	11.5	12	19.7	.435
	Usually	11	19.3	9	15.8	14	24.6	5	8.8	18	31.6	
	Always	6	54.5	1	9.1	2	18.2	0	0.0	2	18.2	
	Never	2	28.6	0	0.0	4	57.1	0	0.0	1	14.3	
	Rarely	7	36.8	3	15.8	6	31.6	1	5.3	2	10.5	
Tetracycline (Tetra etc.)	Sometimes	14	33.3	4	9.5	12	28.6	4	9.5	8	19.0	.434
	Usually	5	25.0	4	20.0	7	35.0	1	5.0	3	15.0	
	Always	2	66.7	1	33.3	0	0.0	0	0.0	0	0.0	
	Never	11	26.2	3	7.1	11	26.2	7	16.7	10	23.8	
	Rarely	15	31.3	8	16.7	10	20.8	1	2.1	14	29.2	
Doxycycline (Monodox, Tetradox)	Sometimes	14	34.1	4	9.8	13	31.7	2	4.9	8	19.5	.744
	Usually	2	11.8	4	23.5	3	17.6	3	17.6	5	29.4	
	Always	2	50.0	1	25.0	1	25.0	0	0.0	0	0.0	
	Never	16	34.8	4	8.7	11	23.9	5	10.9	10	21.7	
	Rarely	13	27.7	7	14.9	12	25.5	3	6.4	12	25.5	
Clindamycin (Klindan, Clin, Cleocin)	Sometimes	15	34.1	3	6.8	16	36.4	2	4.5	8	18.2	.049
	Usually	3	16.7	7	38.9	5	27.8	1	5.6	2	11.1	
	Always	1	33.3	1	33.3	1	33.3	0	0.0	0	0.0	
	Never	14	38.9	2	5.6	8	22.2	2	5.6	10	27.8	
	Rarely	14	25.9	7	13.0	10	18.5	8	14.8	15	27.8	
Spiramycin (Rovamycine)	Sometimes	4	19.0	5	23.8	7	33.3	2	9.5	3	14.3	.148
	Usually	4	50.0	2	25.0	2	25.0	0	0.0	0	0.0	
	Never	23	29.1	5	6.3	22	27.8	5	6.3	24	30.4	
	Rarely	16	34.0	8	17.0	9	19.1	6	12.8	8	17.0	
Cephalosporin (Sef etc.)	Sometimes	6	26.1	6	26.1	6	26.1	2	8.7	3	13.0	.001
	Usually	2	18.2	6	54.5	2	18.2	1	9.1	0	0.0	
	Never	18	26.5	4	5.9	16	23.5	7	10.3	23	33.8	
	Rarely	21	39.6	4	7.5	16	30.2	3	5.7	9	17.0	
Erythromycin (Eritro, Erimicin etc.)	Sometimes	4	21.1	6	31.6	5	26.3	0	0.0	4	21.1	.015
	Usually	2	50.0	2	50.0	0	0.0	0	0.0	0	0.0	
	Never	25	29.8	3	3.6	27	32.1	8	9.5	21	25.0	
	Rarely	16	33.3	9	18.8	8	16.7	5	10.4	10	20.8	
Clarithromycin (Klacid. Macrol. etc.)	Sometimes	8	26.7	6	20.0	11	36.7	0	0.0	5	16.7	.006
	Usually	2	20.0	5	50.0	1	10.0	1	10.0	1	10.0	
	Never	20	27.0	4	5.4	21	28.4	7	9.5	22	29.7	
	Rarely	17	41.5	5	12.2	7	17.1	5	12.2	7	17.1	
Azithromycin (Azitro, Zithromax)	Sometimes	7	20.6	9	26.5	11	32.4	2	5.9	5	14.7	.073
	Usually	6	40.0	3	20.0	2	13.3	0	0.0	4	26.7	
	Never	19	32.2	2	3.4	18	30.5	4	6.8	16	27.1	
	Rarely	15	31.9	6	12.8	9	19.1	7	14.9	10	21.3	

*Chi-square. Fisher's exact tests

DISCUSSION

This epidemiological study compares the antibiotics dentists prefer to treat periodontal disease and conditions and the reasons for prescribing and not prescribing antibiotics.

Periodontal disease is an inflammatory disease of bacterial origin that affects the supporting tissues, and its leading cause is the accumulation of microbial dental plaque (15). Although there is strong evidence that mechanical therapy is effective in removing supra and subgingival plaque, it may not be able to destroy pathogens in hard-to-reach areas (16). Therefore, there is a consensus that systemic antibiotics and mechanical therapy may be beneficial in some cases (17,18).

In preventing the progression of periodontal diseases, the priority is to eliminate the factors that cause the onset of the disease and then to observe the regression of symptoms. Therefore, antibiotic use is not necessary in all cases (19). In a clinical study by Mohan et al. (20), while not supporting the routine use of antibiotics after periodontal surgical treatments, they concluded that antibiotics should be used only for medical indications and in case of infection in the postoperative period. The majority of the participants in our study stated that they never prescribed antibiotics for non-surgical mechanical treatment, including tooth surface cleaning and root surface straightening (76%) and for surgical procedures such as frenectomy (80%), gingivectomy (75%) and crown lengthening procedures (63%). Studies have shown that systemic antibiotics are unnecessary in such simple periodontal surgical procedures, and our survey results are consistent with the available literature (21,22). Compared to routine dental surgery, sinus surgery is supported by studies that show higher morbidity due to possible additional infection routes such as bacterial invasion and graft material (23). In our study, most participants (59%) said they preferred to prescribe antibiotics for sinus surgery.

In a study conducted by Mollahaliloğlu et al. (24) in 2013 covering various healthcare institutions in Turkey, it was reported that physicians most frequently prescribed "beta-lactam antibacterials, penicillins" and "amoxicillin+clavulanic acid" and this attitude was similar in 4 different healthcare institutions (primary healthcare institutions, state hospital, private hospital, and university hospital). In a study conducted by Mainjot et al. (25) with 268 dentists, 4.2% of patients were prescribed antibiotics, and 82% of the choices were amoxicillin, amoxicillin/clavulanate, and clindamycin. In a study of 686 dentists investigating antibiotic prescribing practices of members of the American Association of Endodontists, it was reported that the most preferred antibiotics were amoxicillin and penicillin. At the same time, clindamycin was the first choice in cases of medical allergy. It was reported that antibiotics prescribed in 36.89% of patients were unnecessary, and the most common reason for

prescribing antibiotics was patient expectations (26). Similarly, in our study, it was observed that amoxicillin-clavulanic acid (80%) and metronidazole (57%) were the most commonly prescribed antibiotics in periodontal treatment procedures.

In a study done in Germany that investigates the accuracy of the prescription and the amount of antibiotics prescribed by clinical guidelines, it was emphasized that dentists prescribe antibiotics with the desire to prevent clinical complications, fear of losing patients, and patient pressure (27). In our study, the majority of the participants stated that they prescribed antibiotics with the idea that antibiotic use improves clinical outcomes (70.5%) and reduces postoperative complications (70.5%) in addition to non-surgical mechanical treatment.

There are different regimens regarding the timing of antibiotic use in surgical procedures. In most studies, there is no standard and definite antibiotic regimen (28,29). In our study, most dentists preferred to use antibiotics for five days (23.4%) and seven days (24%) after periodontal surgical procedures.

CONCLUSION

The use of adjunctive systemic antibiotics in periodontal treatments is a subject that needs to be evaluated very well because systemic antibiotics have disadvantages such as having side effects, causing the development of bacterial resistance, and interactions with other drugs used by the patient. To prevent these side effects, dentists are responsible for choosing the correct indication, the proper dosage, and the right drug. The expertise of physicians affects both the use of antibiotics with the correct indication and the selection of the appropriate group of antibiotics.

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