

KNOWLEDGE AND PRACTICES OF DENTAL PRACTITIONERS REGARDING ANTIBIOTIC PRESCRIPTION

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ABSTRACT

Introduction: Dentists rely on antibiotics for the treatment of a wide variety of dental conditions. General dental practitioners prescribe antibiotics which are inappropriate both therapeutically and prophylactically. There is a need for dentists to prescribe antibiotics responsibly.

Material & Methods: A Cross sectional descriptive study was conducted on 150 dental practitioners of Sharif Medical and Dental College, SMDC, Lahore using a validated questionnaire. The practices were classified as poor (0-2), bad (3-5) and good (6-8). The knowledge of the participants was classified as poor (0-7), bad (8-14) and good (15-22). SPSS version 23 was used for analysis. Chi square and Fisher exact test was used to find the statistical association between level of practice and knowledge with antibiotic prescription trends for dental problems.

Results: Majority of the respondents (86.7%) had good knowledge regarding antibiotic prescription while 13.3% had bad knowledge and 93.3% of the dentists demonstrated good practice of antibiotic prescription while none had poor practices. Majority of the dental practitioners (87.3%) prescribed antibiotics as post-operative prophylaxis. The association between knowledge and antibiotic prescription for fever ($p=0.032$), localized swelling ($p=0.003$), diffused swelling ($p=0.0025$), Root canal treatment ($p=0.027$), tooth fracture ($p=0.041$), delayed treatment ($p=0.026$) and acute pulpitis ($p=0.057$) were found to be significant.

Conclusion: The most common dental problem for which dentists prescribed antibiotics was for post-operative prophylaxis followed by for diffused oral swelling. Most of the dentists had good knowledge and practices regarding antibiotic prescription.

Key Words: Antibiotic prescription, Dental practitioners, Knowledge, Practice

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INTRODUCTION

Antibiotics are the drugs that are used to treat bacterial infections, either by halting their multiplication or killing them completely.¹⁻⁴ Dental pain is one of the major dental problems reported to the dentists. The predominant reason for this pain is an underlying odontogenic infection.⁵ In order to treat these oral infections, the use of antibiotics is widespread by dental practitioners.⁶ Since the introduction of antibiotics in mid-twentieth century, they have been a part of both clinical and pharmacological research. It is of no doubt that dentists have been using antibiotics for a very long time due to a number of reasons such as dental problems and those concerning the orofacial region.⁷ The use of antibiotics in dentistry is predominantly recommended as a prophylactic measure to prevent the spread of dental infection.⁸ The prescription of antibiotics prior to an invasive dental procedure is not widely accepted neither recommended.⁹ Literature supports that majority of the dental infections have their origin in the gingiva or periodontium and can be effectively treated without the use of antibiotics through

dental treatments like Root canal or tooth extraction.^{10,11} It has been reported previously that 30% of the antibiotics prescribed for various conditions were absolutely unnecessary¹² and dental practitioners have been reported to have prescribed 10% of these medications.¹³

According to one study that evaluated the knowledge and practices of dentists regarding antibiotic prescriptions reported that 97.2% said that they were aware of antibiotic resistance, 98.1% reported that they believe that it is important to take medical history before prescribing antibiotics, 91.5% responded that antibiotic resistance meant that the bacteria acquire resistance to antibiotics while only 7.5% said that it was due to the inability of the body to respond to the drugs.¹⁴ Regarding practices of dentists, the study above reported that 97.2% dentists explained to their patients the proper regime of the antibiotic usage, 64.2% explained their adverse effects to the patients, 90.5% said that they carefully evaluated if the antibiotics they prescribed interacted with another medication that the

patient was taking and 89.6% reported inquiring the patient about any allergic reactions experienced to antibiotic use in the past.¹⁴ There is not enough literature that reports the knowledge and practices of dentists regarding antibiotics and their prescription trends. The objective of this study was to assess the knowledge and practices of dentists regarding the prescription of antibiotics.

MATERIAL AND METHODS

A Cross sectional descriptive study was conducted on dental practitioners of Sharif Medical and Dental College, SMDC, Lahore from June 2019 to June 2020. Data was collected from 150 dental practitioners using a validated questionnaire with a Cronbach alpha value of 0.914 after taking informed consent. Keeping the prevalence of antibiotic prescription in dentists 11.3% with 5 % precision and 95% confidence level the sample size was calculated to be 155.¹⁵ The sampling technique used was nonprobability convenient sampling. Ethical approval was obtained from Sharif Medical Research Centre (SMRC). The questionnaire comprised of three sections. Section 1 had questions regarding the demographics of the participants (name, age, gender, and years of experience, designation, and department). Section 2 had four questions to assess the practice. For practice a score of 0 was given to “no,” a score of 1 was given to “don’t know,” and a score of 2 was given to “yes.” There were two negatively framed statements for which reverse scoring was done which means a score of 0 was given to “yes,” 1 to “don’t know,” and 2 to “no.”¹⁶ This way, a respondent could score a maximum of 8 and a minimum of 0 in the practice section. Based on these scores, the practices were classified as poor (0-2), bad (3-5) and good (6-8). Section 3 had eleven questions to assess knowledge. The same scoring system was used as for practice questions. A respondent could score a maximum of 22 and a minimum of 0 in this section. Based on these scores the knowledge of the participants was classified as poor (0-7), bad (8-14) and good (15-22). The proforma also included questions regarding the various dental problems and antibiotic prescription habits of dentists. All participants irrespective of their age and gender and dental practitioners with a clinical experience of more than 6 months were included in the study. Dentists working in the basic dental sciences were excluded from the study

Recorded data was coded and entered using SPSS statistical package version 23.0. *p* value of 0.05 or less will be considered significant. Numerical data was reported as mean and standard deviation. Nominal data was recorded as frequency and/or percentages. Fisher exact test was used to find the statistical association between level of practice and trend of antibiotic prescription in dental problems. Chi square test was used to find the association between level of knowledge and antibiotic prescription in fever, localized swelling, diffused swelling, pericoronitis, periodontal abscess, cellulitis, Root canal treatment of infected tooth, extraction of tooth with abscess and tooth fracture. Fisher exact test was used to find the statistical association between level of knowledge and antibiotic prescription in trismus, eye closure due to swelling, uncertain diagnosis, delayed treatment, post-operative

prophylaxis, acute pulpitis, acute Periapical condition, and chronic Periapical condition.

RESULTS

A study based on data collected from 150 dental practitioners of Sharif College of Dentistry (SMDC) was conducted. The mean age of the participants was 25.07 ± 4.582 with 37% males and 63% females. The participants had a mean clinical experience of 1.90 ± 2.801 . It was seen that majority of the participants had a mean knowledge score of 18.29 ± 2.834 . Majority of the respondents (86.7%) had a good knowledge regarding antibiotic prescription while 13.3 % were found to have bad knowledge. None of the respondents had poor knowledge as shown in table 1.

It was evident that 55% of the dentists considered antibiotics as an essential part of dental treatment and 83 % were aware of their use as prophylactic measures for infections. It was seen that 87% of the practitioners reported that their patients readily accept antibiotics. A vast majority of dentists (93%) were in acknowledgement of the presence of international guidelines for antibiotic prescription. Regarding over prescription of antibiotics, 80% reported that antibiotics are over prescribed because of lack of judgement, 84% said that these drugs are often misused. A great percentage of participants (93%) reported that frequent prescription of antibiotics is harmful while 79% reported that their patients have reported to them with side effects of these drugs. It was reported by 89% of the dentists that frequent use of these drugs leads to drug resistance and 75% reported observing antibiotic resistance in patients. It was further seen that 66% of the dentists were of the view that antibiotics are prescribed according to the economic status of the patients. as shown in figure 1.

The mean score for practice was found to be 6.91 ± 1.402 . It was seen that 93.3% of the dentists demonstrated good practice of antibiotic prescription while none were found to have a poor practice regarding the same as shown in table 2.

It was evident that 13% dentists frequently prescribed antibiotics. Majority of the dental practitioners (89%) prescribed antibiotics after dental surgery while only 11% prescribed them on the insistence and demand of the patient. It was further seen that 87% dentists faced difficulty in dealing with noncompliant patients as shown in figure 2.

It was further seen that the conditions in which dental practitioners predominantly prescribed antibiotics was for post treatment prophylaxis and least for conditions with uncertain diagnosis as shown in figure 3. The association between the level of practice and knowledge of dental practitioners and the condition of antibiotic prescription is shown in table 3.

DISCUSSION

According to our study vast majority of dentists (93%) acknowledged the presence of international guidelines for antibiotic prescription as compared to the 17%¹⁷ dental practitioners with a Bachelors of Dental Surgery and 56% dental practitioners with a Masters of Dental Surgery. It is worth discussing that this marked difference clearly exhibits inadequate knowledge regarding antibiotic prescription and can be related to

the inexperience pertaining antibiotic prescription in dentistry.

According to our study, 11% antibiotics were prescribed on the patient's insistence. This is a substantially higher percentage in comparison to 4%¹⁸ of the dentists as reported in another study. Furthermore, it was seen in our study that 80% dentists reported a lack of judgment with respect to antibiotic prescription in comparison to the 18.8% in another study. Regarding the knowledge of development to antibiotic resistance due to frequent use, our study reported that 89% dentists were aware of it. Similar results were seen in another where it was reported that 88% general dental practitioners and 99% paediatric dentists were aware of antibiotic resistance.¹⁷ Our study reported the percentage of antibiotic prescription to be 13% among dentists which is much higher in comparison to 6%¹⁸ among dentists as reported in another study. Even more conflicting results were reported by another study as compared to our study where only 2.9%¹⁹ dentists prescribed antibiotics frequently. There is also evidence of antibiotics being prescribed prophylactically about 83% according to this survey.

There are several reports confirming the use of antibiotics postoperatively. In our study majority of the dental practitioners (87.3%) prescribed antibiotics as post-operative prophylaxis, 52% for diffused oral swelling followed by 51.3% for cellulitis and 51.3% for periodontal abscess as well. Another study reported that 71.4%²⁰ members of the American College of Oral and Maxillofacial surgeons followed the same practice while placing dental implants in patients. The results compiled in another article showed that 56% to 68%¹⁸ of the respondents opted for post-operative antibiotics for implant and surgical extractions.

It is important to highlight that Dentistry is a technical profession and dentists often have to deal with uncooperative patients and non-compliant patients that do not adhere to their instructions. When inquired about them, a significant number of dentists (87%) reported facing immense difficulty while dealing with noncompliant patients in our study. Similar pattern of results were obtained from an Indian study suggesting that in order to deal with non-compliant patients especially children, short courses of prescribing antibiotics are preferred over long courses.¹⁷ Furthermore, it was very evident from the results of our study that 55% of the dentists considered antibiotics an essential part of dental treatment contrary to the Indian dentists that believe antibiotics should never be used as a first line treatment.

It is of extreme importance that dental students are given adequate awareness and training regarding the correct and responsible prescription of antibiotics. There is a dire need for introducing training programs and seminars that help the dental practitioners enhance their existing knowledge regarding antibiotic prescription and improve their practices in the light of this knowledge.

CONCLUSION

The most common dental problem for which dentists prescribed antibiotics was for post-operative prophylaxis followed by for diffused oral swelling and

then cellulitis and periodontal abscess as well. Most of the dentists had good knowledge and practices regarding antibiotic prescription.

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Table 1: Knowledge scores

MEAN SCORE	LEVEL OF KNOWLEDGE REGARDING ANTIBIOTIC PRESCRIPTION		
	GOOD	BAD	POOR
18.29 ± 2.834	86.7%	13.3%	0%

Table 2: Practice scores

MEAN SCORE	PRACTICES OF DENTISTS REGARDING ANTIBIOTIC PRESCRIPTION		
	GOOD	BAD	POOR
7.08±1.179	93.3%	6.7%	0%

Table 3: Association between practice and knowledge of antibiotic prescription with various dental problems

CONDITIONS FOR ANTIBIOTIC PRESCRIPTION	PRACTICE			p value	KNOWLEDGE		p value
	GOOD	BAD			BAD	GOOD	
FEVER	68 (45.3%)	3 (2%)	0.334	5 (3.3%)	66 (44%)	0.032	
LOCALIZED SWELLING	66 (44%)	3 (2%)	0.343	3 (2%)	66 (44%)	0.003	
DIFFUSED SWELLING	73 (48.7%)	5 (3.3%)	1.000	4 (2.7%)	74 (49.3%)	0.002	
TRISMUS	14 (9.3%)	0 (0%)	0.599	3 (2%)	11 (7.3%)	0.402	
EYE CLOSURE DUE TO SWELLING	29 (19.3%)	0 (0%)	0.210	4 (2.7%)	25 (16.7%)	1.000	
UNCERTAIN DIAGNOSIS	4 (2.7%)	0 (0%)	1.000	0 (0%)	4 (2.7%)	1.000	
DELAYED TREATMENT	25 (16.7%)	0 (0%)	0.215	0 (0%)	25 (16.7%)	0.026	
PROPHYLAXIS OF POST OPERATIVE COMPLICATIONS	122 (81.3%)	9 (6%)	1.000	18 (12%)	113(75.3%)	1.000	
ACUTE PULPITIS	12 (8%)	0 (0%)	1.000	4 (2.7%)	8 (5.3%)	0.057	
ACUTE PERIAPICAL CONDITIONS	22 (14.7%)	0 (0%)	0.359	2 (1.3%)	20 (13.3%)	0.739	
CHRONIC PERIAPICAL CONDITIONS	15 (10.1%)	0 (0%)	1.000	2 (1.4%)	13 (8.8%)	1.000	
PERICORONITIS	70 (46.7%)	2 (1.3%)	0.100	7 (4.7%)	65 (43.3%)	0.211	
PERIODONTAL ABSCESS	74 (49.3%)	3 (2%)	0.201	7 (4.7%)	70 (46.7%)	0.116	

CELLULITIS	74 (49.3%)	3 (2%)	0.201	10 (6.7%)	67 (44.7%)	0.898
ROOT CANAL TREATMENT OF INFECTED TOOTH	69 (46%)	3 (2%)	0.331	5 (3.3%)	67 (44.7%)	0.027
EXTRACTION OF TOOTH WITH ABSCESS	50 (33.3%)	3 (2%)	1.000	5 (3.3%)	48 (32%)	0.299
TOOTH FRACTURE	42 (28%)	2 (1.3%)	0.724	2 (1.3%)	42 (28%)	0.041

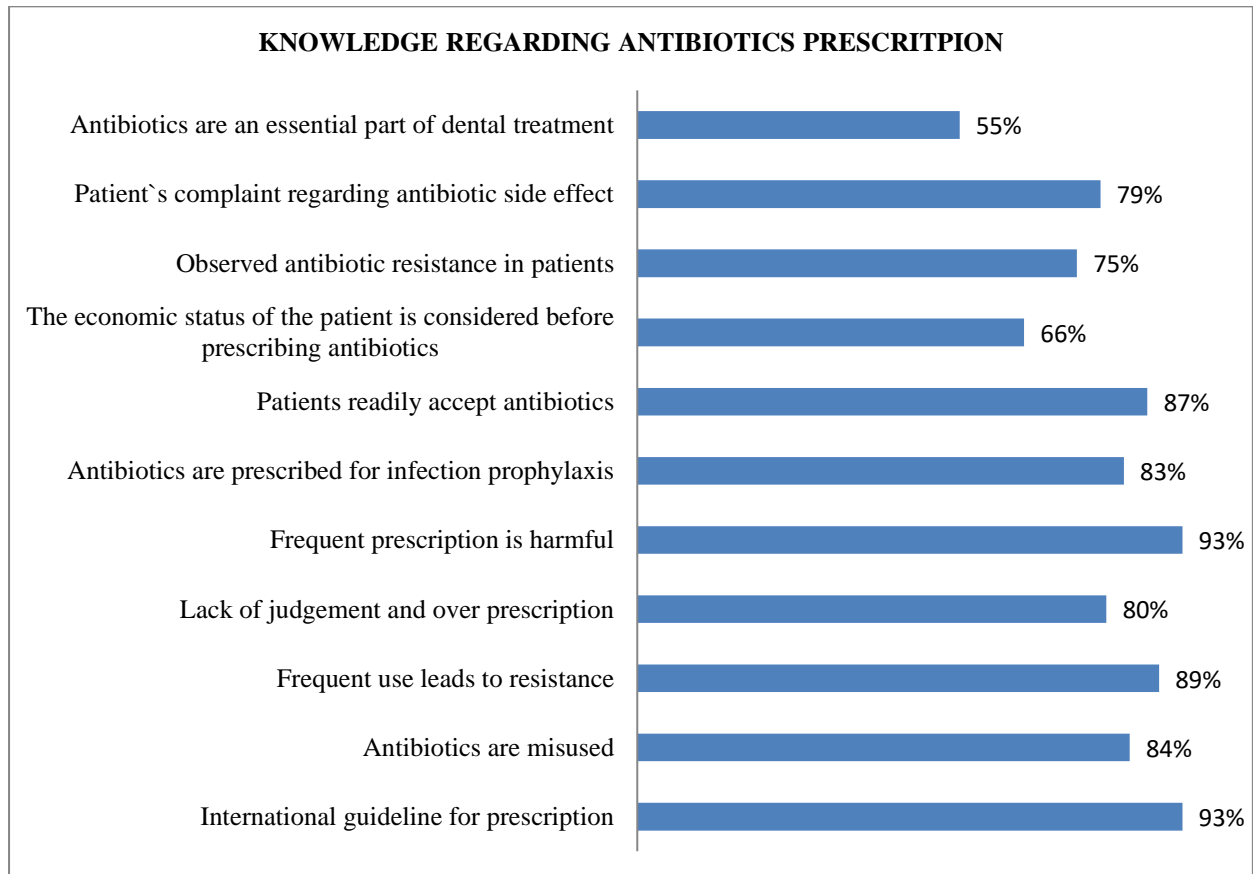


Figure 1: Knowledge regarding antibiotic prescription

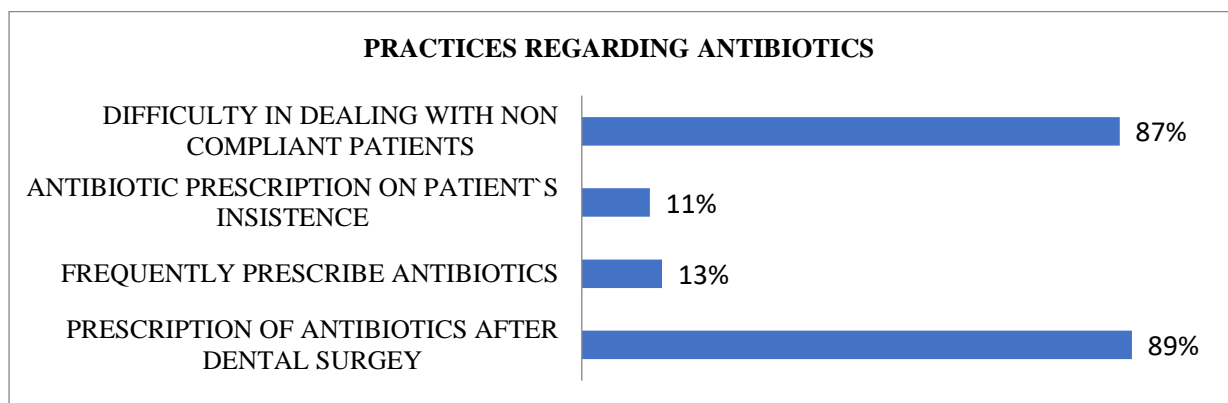


Figure 2: Practices of dental practitioners regarding antibiotic prescription

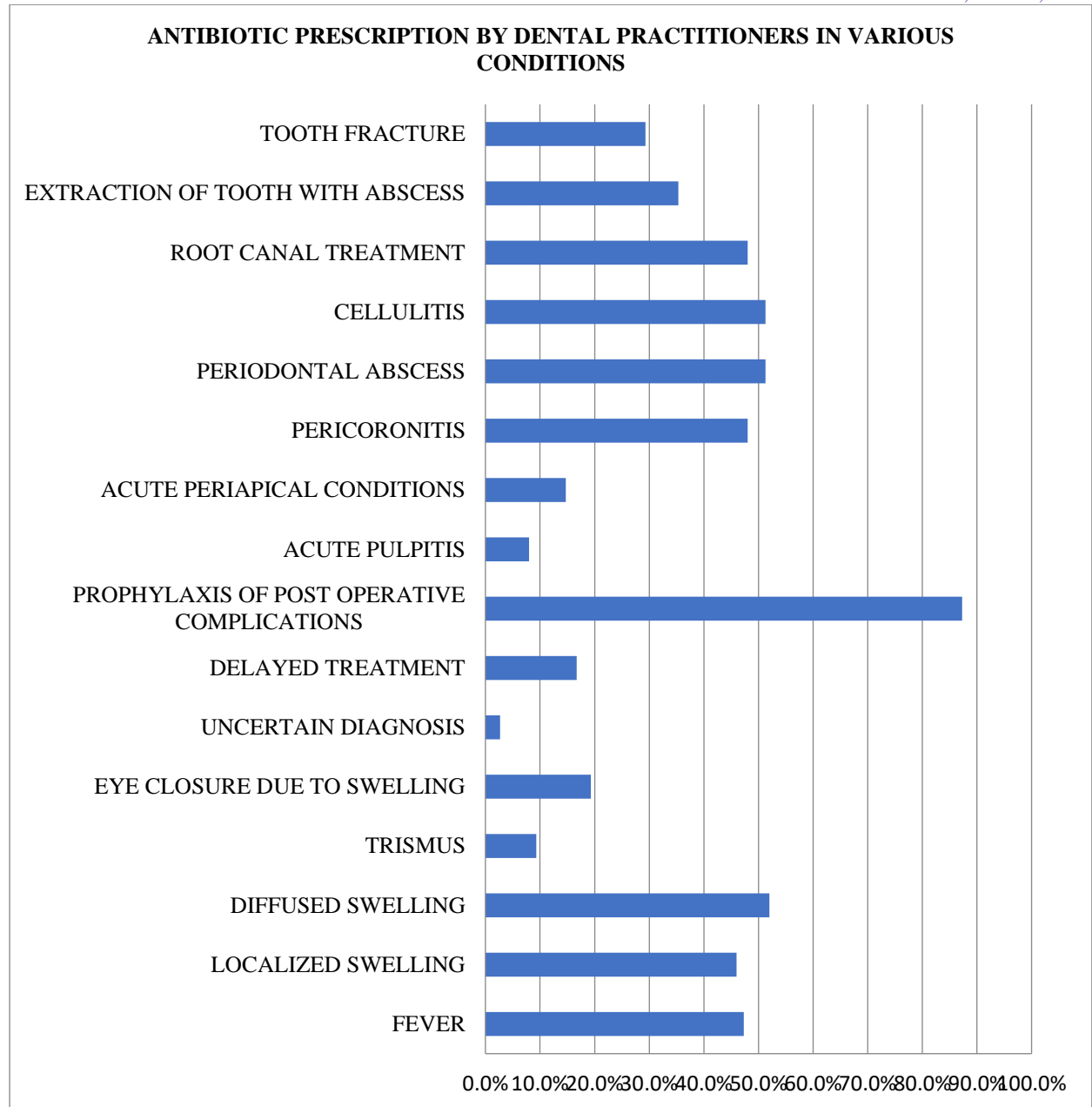


Figure 1: Common dental conditions for antibiotic prescription