AJDM
ALTAMASH JOURNAL OF DENTISTRY AND MEDICINE

Original Article

The Perception of Dental Patients regarding Antibiotics

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Abstract.

Objective: To evaluate the level of knowledge and attitude towards the use of antibiotic usage among dental patients.

Study design: Cross Sectional study

Place and duration of study: Various institutes of Karachi, Pakistan. March to June 2021.

Material and methods: A well-structured and validated questionnaire, filled by 304 dental patients was included in the study. The data collected were statistically analyzed through SPSS 25. A $p \leq 0.05$ was considered significant.

Results: Out of the total 304 participants included, 182 (59.9%) participants belonged to the age bracket of 21-30 years. Majority of the 208 (68.4%) participants believed that antibiotics are necessary after undergoing tooth extraction. About 186 (61.2%) of the patients themselves asked the dental surgeon for prescribing antibiotics when they were not prescribed to them. When the participants were asked about their reason for getting an antibiotic prescription, most of the 166 (54.6%) respondents stated that to prevent the development of infection. Moreover, about half of the participants accepted self-medicating them with an antibiotic. About 116 (38.2%) participants self medicated them with augmentin, and 16 (5.3%) participants taking amoxil. Lastly, regarding antibiotic resistance, majority of the 194 (63.8%) respondents knows about the antibiotic resistance, while 110 (36.2%) respondents have no idea about it.

Keywords: Attitude, awareness, general population, self medication.

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Introduction

Antibiotic resistance represents a worldwide public health risk that has the potential to increase the incidence of numerous morbidities and mortalities in the upcoming 10 years due to unfolding of multi-resistant drug bacterial strains.[1,2]

General dentists usually prescribe medications for the management and treatment of the infections of the oral cavity. Among those medications, antibiotics accounts for the majority of medicines prescribed by the dentists. It has become a mainstay of treatment for the general dental practitioners.[3] Dentists all around the globe prescribe 7% to 11% of all common antibiotics which includes beta-lactams, macrolides, tetracyclines, clindamycin, and metronidazole. This prescribing of antibiotics does come with some unfavorable side effects ranging from gastrointestinal disturbances to fatal anaphylactic shock and most importantly in the long term, the development of resistance to antibiotics.[4]

Antibiotic resistance is accelerated by repeated or misuseadministration of antibiotics especially broad-spectrum agents such as cephalosporins and fluoroquinolones. Repeated unwanted or prolonged exposure of bacteria to antibiotics gives them the opportunity to develop defense mechanisms and thereby become immune to antibiotics.[5,6] We have now entered a stage where some bacterial species are resistant to even the full range of antibiotics currently available, with the methicillin-resistant staphylococcus aureus being the most widely known example of extensive resistance.[7]

A system to check and balance regarding the awareness and prescription is important among health care professionals, as well as among the general population, to reduce antibiotic resistance.[8,9] Numerous strategies have been applied worldwide to combat over prescription of antibiotics, targeting both health care professionals and the general public.

Baig et al. evaluated the prevalence of self-medication among dental patients visiting a local hospital and found that 70.8% respondents committed that they were involved in self medication practice with oral analgesic being the most used drug 58.8%.[10] As per author's knowledge no study has been conducted yet to evaluate the knowledge and attitude of dental patients towards the usage of antibiotics in Pakistan. Therefore, we aim to evaluate the level of knowledge and attitude towards the use of antibiotic usage among dental patients.

Materials and methods

This cross-sectional study was conducted at various dental institutes in Karachi, Pakistan. Prior approval from ethics and the review board has been sought out.The purpose of the research was explained to each subject and informed consent was taken. The research was conducted for a The duration of 04 months. The sample size was calculated using Open-Epi software. Considering a mean response of 56.43%[11] with a confidence interval of 95%, and margin of error 5%. Power of the test 80.The estimated sample size selected for this study was 300 patients. Walk-in OPD patients in the Oral Surgerydepartment of various institutes of Karachi were recruited by applying the nonprobability convenience sampling technique. The subjects included in the study were dental patients who are otherwise healthy aged between 21-60 years having history of at least one tooth extraction. Exclusion criteria included children and old age (>65 years) individuals and those who were physically and mentally unable to participate and give objective replies.

The modified form of questionnaire published by Boxx and Laskinwas was used.[11] Questions regarding the knowledge of the adverse effects and resistance to antibiotics were also added. were added The questionnaire was prior validated for internal consistency and reliability the Cronbach alpha value obtained was 0.75. A total of 320 questionnaires were distributed to enquire patients about their demography, and their knowledge and attitude towards the use of antibiotics. The knowledge was evaluated using 06 questions including, Do you think it is necessary to take antibiotics after extraction, do you think dental practitioner will prescribe you an antibiotics if you have dental pain, do you expect that the dental practitioner will prescribe

you an antibiotic if you have an infection, what are the benefits of antibiotics, what are the adverse effects of antibiotics and have you ever heard of resistance to antibiotics. The attitude was evaluated using 06 questions including, if the dental practitioner did not prescribe any antibiotic, would you ask for it? Why would you ask for antibiotics? If the dental practitioner did not prescribe any antibiotic, would you go to another one to ask for it? Have you ever self-medicated an antibiotics and mention the antibiotic you self-medicate for an infection? (Drug/dosage).The data was entered and analyzed with statistical package for social sciences (SPSS) version 25. Descriptive statistics were done to calculate the mean values and percentages for age, gender, level of education and level of knowledgeand attitude towards the use of antibiotic usageamongdental patients. A $p \leq 0.05$ was considered significant.

Results

In this cross-sectional study, out of the total 320 questionaires, 304 were included and 16 were excluded as they were partially filled. About the age of participants, the majority of the 182 (59.9%) participants belonged to the age bracket of 21-30 years, followed by 74 (24.3) participants belonging to 31-40 years of age. There were 158 (52.0%) males and 146 (48.0%) females, with most of the 218 (71.7%) participants having an undergraduate level of education, as presented in Table 1.In this study, majority of the 208 (68.4%) participants believed that antibiotics are necessary after undergoing tooth extraction.

Table 1. Demographic characteristics of the participan

Variables	Demographics	Frequency and Percentage
Age	21-30 years 31-40 years 41-50 years 51-60 years	182 (59.9%) 74 (24.3%) 26 (8.6%) 22 (7.2%)
Gender	Male Female	158 (52.0%) 146 (48.0%)
Education	Undergraduate Graduate Post-graduate	218 (71.7%) 74 (24.3%) 12 (3.9%)

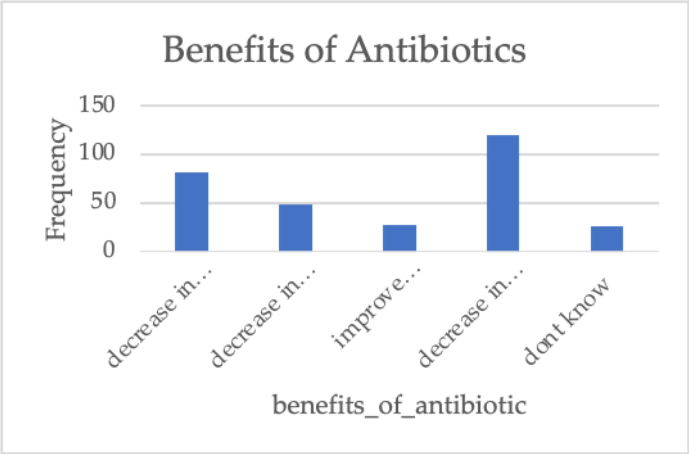

Figure 1. Benefits of antibiotics intake according to participants

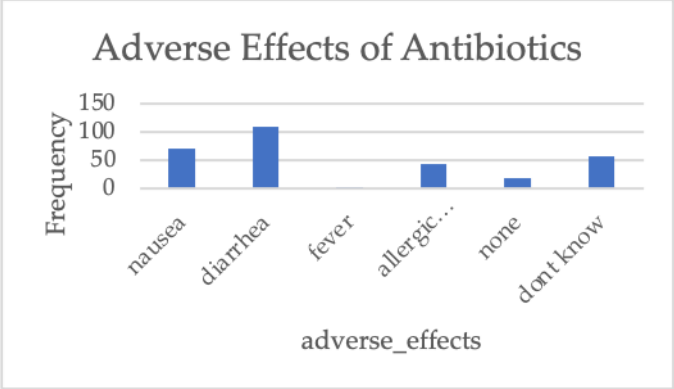

Figure 2. Adverse effects of antibiotics according to the participants.

About 186 (61.2%) of the patients themselves asked the dental surgeon for prescribing antibiotics when they were not prescribed to take them. When the participants were asked about their reason for getting an antibiotic prescription, most of the 166 (54.6%) respondents stated that to prevent the development of infection, they wanted antibiotics, followed by 56 (18.4%) participants wanting antibiotics to feel better.

When the dental practitioner does not prescribe antibiotics to the patient, about 108 (35.5%) of the participants suggested visiting another dental practitioner to get an antibiotic prescription, whereas, 196 (64.5%) participants declined to visit another dental practitioner for an antibiotic prescription. Moreover, the majority 264 (86.8%) of the participants expected that if they have a dental infection an antibiotic will be prescribed by the practitioner. Similarly, when the pain was

expected to arise after dental extractions, most of the 216 (71.1%) participantsexpected that dental practitioner will prescribe them an antibiotic. About the benefits of prescribing antibiotics, most of the participants believed that prescribing antibiotics resulted in decreased chances of development of infection (39.5%) and alleviates pain (27.0%) as presented in figure 1. Since antibiotics are associated with adverse effects, about 110 (36.2%) respondents believed that diarrhea is the most common side effect of an antibiotic followed by nausea (23.0%) and allergic reactions (14.5%) as presented in Figure 2.

Moreover, about half of the participants accepted self-medicating them with an antibiotic.About 116 (38.2%) participants self medicated them with Augmentin (Amoxicillin/clavulanic acid combination), and 16 (5.3%) participants taking Amoxil (Amoxicillin). Lastly regarding antibiotic resistance, majority of the 194 (63.8%) respondents knew about the antibiotic resistance, while 110 (36.2%) respondents have no idea about it.

About comparison of demographic characteristics with responses of the participants, a significant relation was noted between age and item "visiting other practitioners for antibioticprescription after refusal from 1st doctor"(p=0.006), also with "do you expect that the dental practitioner will prescribe you an antibiotic if you have an infection" (p=0.038), and "do you expect that the dental practitioner will prescribe you an antbiotic if you have an pain" (p=0.001). A significant relationship was also found between gender and "Antibiotic dose and drug usefor self-medication"(p=0.041). Likewise, there was a significant association of education with responses "visiting other practitioners for antibiotic prescription after refusal from 1st doctor" (p=0.044), also with the item "what are the benefits of antibiotics" (p=0.038), and in "do you expect that the dental practitioner will prescribe you an antibiotic if you have an infection (p=0.025), "Antibiotic dose and drug use for self-medication" (p=0.003), do you know antibiotic resistance (p=0.034) and knowledge of adverse effects (p=0.017), as presented in Tables 2, 3, and 4

Table 2. Comparison of age with response

Variables	Unstandardized Coefficients		Standardized Coefficients	t	*p*-value
	B	Std. Error	Beta		
Is antibiotic necessary to take after extraction?	-0.275	0.160	-0.139	-1.717	0.087
If the dental practitioner did not prescribe any antibiotic, would you ask for it?	0.292	0.176	0.156	1.665	0.097
Why would you ask for antibiotics?	-0.053	0.039	-0.111	-1.336	0.183
If the dental practitioner did not prescribe any antibiotic, would you go to another one to ask for it?	0.435	0.158	0.228	2.752	0.006
Infection expected so antibiotic to be prescribed	0.360	0.173	0.133	2.084	0.038
Pain expected so antibiotic to be prescribed	-0.593	0.157	-0.294	-3.786	0.001
Are you aware of benefits of antibiotics?	0.076	0.035	0.129	2.187	0.030
Are you aware of adverse effects of antibiotics?	0.010	0.036	0.020	0.283	0.777
Have you ever self-medicated an antibiotic?	-0.176	0.176	-0.096	-0.999	0.319
Antibiotic dose and drug use for self-medication	-0.202	0.151	-0.131	-1.338	0.182
Antibiotic Resistance	0.122	0.137	0.064	0.896	0.371

a. Dependent Variable: age

Table 3. Comparison of gender with responses

Variables	Unstandardized Coefficients		Standardized Coefficients	t	*p*-value
	B	Std. Error	Beta		
Is antibiotic necessary to take after extraction?	-.084	.088	-.078	-.947	.345
If the dental practitioner did not prescribe any antibiotic, would you ask for it?	-.083	.097	-.081	-.851	0.395
Why would you ask for antibiotics?	.017	.022	.067	.798	0.426
If the dental practitioner did not prescribe any antibiotic, would you go to another one to ask for it?	-.130	.087	-.125	-1.487	0.138
Infection Expected So Antibiotic To Be Prescribed	.168	.095	.114	1.763	0.079
Pain Expected So Antibiotic To Be Prescribed	-.045	.087	-.041	-.521	0.603
Are you aware of benefits of antibiotics?	-.035	.019	-.110	-1.848	0.066
Are you aware of adverse effects of antibiotics?	.003	.020	.011	.153	0.878
Have you ever self-medicated an antibiotic?	.099	.097	.099	1.013	0.312
Antibiotic dose and drug use for self-medication	0.171	.083	.204	2.053	0.041
Antibiotic Resistance	-0.024	.076	-.023	-.320	0.749
a. Dependent Variable: gender					

Table 4. Comparison of education with responses

Questions	Unstandardized Coefficients		Standardized Coefficients	t	*p*-value
	B	Std. Error	Beta		
Is antibiotic necessary to take after extraction?	.150	.093	.127	1.605	.110
If the dental practitioner did not prescribe any antibiotic, would you ask for it?	.081	.102	.072	.792	.429
Why Ask For Antibiotic?	-.016	.023	-.055	-.677	.499
If the dental practitioner did not prescribe any antibiotic, would you go to another one to ask for it?	.186	.092	.164	2.023	0.044
Infection Expected So Antibiotic To Be Prescribed	-.054	.101	-.033	-.534	0.594
Pain Expected So Antibiotic To Be Prescribed	0.205	0.091	0.171	2.249	0.025
Are you aware of benefits of antibiotics?	-0.040	0.020	-0.113	-1.960	0.051
Are you aware of adverse effects of antibiotics?	.050	.021	.169	2.396	0.017
Have you ever self-medicated an antibiotic?	.101	.103	.093	.987	0.325
Antibiotic dose and drug use for self-medication	.261	.088	.285	2.967	0.003
Antibiotic Resistance	-.170	.080	-.150	-2.134	0.034
a. Dependent Variable: education					

Discussion

This study was carried out with a purpose of assessing the attitude and awareness level of dental patients regarding usage of antibiotics. In dental practice it is usually prescribed by the practitioner for the treatment of underlying infection. But due to ease of availability and accessibility, lack of knowledge, inadequate enforcement of regulatory policies, poor accessibility to healthcare providers, and lack of public healthcare facilities they are injudiciously used by the general population leading to increase in its resistance.[12]

In this study, majority of the participants (68.4%) believed that it is necessary to take antibiotics after extraction and 61.2% patients will ask for it, if the dental practitioner did not prescribe it which is in correspondence to a study by Pérez-Amate et al,[13] where 76.6% expected their dentists to prescribe an antibiotic after tooth extraction while 45% mentioned that if the professional did not prescribe an antibiotic, they would personally request such medication. Similar results were also observed in a study by Box xet al. where 66.6% patients expected to receive an antibiotic after extraction and 70% of this group indicated that they would ask for it if not prescribed.[11] In all these studies the prevention of postoperative infections was the main indication for antibiotic treatment which strongly signifies that the general population is not aware of the prophylactic use of antibiotics. According to the literature, there is no evidence that prophylactic antibiotics given to healthy patients after routine tooth extraction can prevent infections. The use of antibiotic therapy without appropriate indications can result in the development of resistant organisms andthat the benefit of routinely prescribing antibiotics does not seem to clearly outweigh the risk of side effects.[14-16] Moreover, the majority 71.1% participants expected that if they have a dental pain, the dental practitioner will prescribe them an antibiotic which furtheradds on to their lack of knowledge about the indication of an antibiotic. In a study by Simon et al, evaluated more than 3800 extractions in patients with poor oral hygiene and high prevalence of HIV infections and found a complication rate of only 1.1% without any antibiotic prophylaxis.[17] Therefore, it is reasonable to think that in healthy patients the complication rate will be even lesser. In another study, Deepa et al evaluated 483 patients to determine if there was a need to prescribe antibiotics after extraction .or not and found only 0.4% of the patient needed to be prescribed therapeutic antibiotics.[18] Sidana et al conducted a double blind clinical trial to evaluate the need of antibiotic after extraction in healthy patients and concluded that there is no justification for routine antibiotic prophylaxis for dental extractions in healthy patients.[14]

Moreover when asked about the benefits and side effects of an antibiotics, majority of the patients (39.5%) thinks that an antibiotic decreases the chance of development of an infection. Whereas 36.2% respondents believed that diarrhea is the most common side effect of an antibiotic followed by nausea (23.0%), and allergic reactions (14.5%) which are again in accordance with Pérez-Amate et al where majority believes that an antibiotic decreases the chance of an infection and that diarrhea along with nausea, vomiting and allergic reactions are the most common symptoms.[13]

Strikingly, about half of the participants accepted self-medicating them with an antibiotic this could be due to the fact that 70% participants were young with less education. Self medication with antibiotics is a global concern now. The prevalence of self medication with antibiotics among general public is high especially in low or middle income countries including, Bulgaria 43% Beirut 43% Greece 76.2%, Jordan 40.7% Nigeria 82.2% Saudia Arabia 78.7% Turkey 59.6%, United Arab Emirates 56%. The commonly reported factors associated with self medication were as follows: past effective use, level of education, age group and middle (income) class and job type.[19]

There is a strong need to implement antibiotic awareness campaigns in order to encourage better practices among the general public as they have been shown to be effective in changing attitudes and knowledge about antibiotic use and

microbial resistances.[20] Moreover, the dental practitioner themselves should councel and educate their patients about the need, antibiotic resistance and the dangers of misuse.

Conclusion

The present study provided evidence that variable levels of understanding of antibiotics use is found among the general public reporting to the dental practitioners. This lack of education results in self medication which is contributing towards antibiotic resistance. Therefore, there is a strong need to change the attitude of general public towards self medication through awareness campaigns.

Author Contribution

1. **S.M:** Conceived and designed the analysis, collected the data, Literature review
2. **J.A:** Final review of the manuscript and Critical review
3. **A.M:** Critical review,Analysis interpreted the result
4. **M.W.L:** Literature review,Manuscript writing
5. **Q(*Qazi*).S *(Salman)*.A(*Ahmed*):** Data collection
6. **Q*(Qazi)*.S*(Shahmeer)*.A(*Ahmed*):** Data collection

Conflict of interest no

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