

Knowledge and Practices of Patients Regarding Antibiotics Used For Dental Problems



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OBJECTIVES: The objective of this survey was to assess the level of common knowledge and practices concerning usage of antibiotics among dental patients.

METHODOLOGY: A descriptive questionnaire-based survey was done consisting of fifteen questions at the Institute of Dentistry, CMH Lahore Medical College.

RESULTS: Sample included 500 dental patients, 237 males (48.2%) and 255 females (51.8%). Participants were divided into various groups; less educated (up to matriculation level), more educated (above matriculation level), low-income (<25000 PKR monthly) and high-income (25000 PKR and above monthly).

Majority (61.8%) of the sample thought antibiotics have antiviral effects. Three-fourth (75.5%) of the sample thought antibiotics have an analgesic effect while (67.3%) thought antibiotics should be prescribed post-extraction.

Thirty-eight percent thought that antibiotics should be taken before any dental work while more than half (54.7%) knew that antibiotics have side effects. Majority (74.5%) knew that unnecessary use of antibiotics make them ineffective leading to antibiotic resistance. In the sample, (90.7%) believed it was important to complete the course of antibiotics prescribed by dentist but (43%) used to discontinue antibiotics on feeling better. Twenty six percent of the sample considered homeopathic medicine more effective than antibiotics for treatment of infections.

Self-medication was reported by (42.3%) and (41.1%) used antibiotics prescribed by pharmacists at some point in their lives.

CONCLUSION: Patients' knowledge about antibiotics was inadequate, antibiotics misuse was widespread and high self-medication rates were reported.

KEYWORDS: Antibiotics, Self-medication, Antimicrobial resistance, Patient, Knowledge, Dentistry.

HOW TO CITE: Sohail A, Yaseen A, Qazi SR. Knowledge and practices of patients regarding antibiotics used for dental problems. J Pak Dent Assoc 2020;29(2):71-76.

DOI: <https://doi.org/10.25301/JPDA.292.71>

Received: 29 June 2019, Accepted: 28 February 2020

INTRODUCTION

Antibiotics are commonly used as well as misused drugs in the world, particularly in developing countries.¹ In dentistry, there is evidence to suggest over-prescription of antibiotics by dental practitioners in the management of acute dental conditions, despite contrary clinical guidelines.² This might be due to uncertainty about diagnosis, demand and expectations of patients, and because of the pressure of time on the clinician.³ Patient expectations increase the possibility of receiving a particular prescription by three times.⁴

Inappropriate antibiotic prescribing habits lead to the development of resistant bacterial strains.⁵ Centers for Disease Control US (CDC) estimates that at least 30% of oral antibiotic courses prescribed in the outpatient setting during 2010-11 were unnecessary.⁶ In an English study, general dental practitioners (GDPs) reported that their decisions in antibiotic prescribing were compelled by both clinical related pressures and wider responsibilities towards public health.⁷

Over the years, misuse of antibiotics has resulted in the emergence of antibiotic-resistant bacterial strains which are intensifying with time⁸ and caused death of around 23,000 people in US.⁹ Dentists in primary care make up approximately one in ten of all therapeutic antibiotic prescriptions, hence contributing to the problem of bacterial resistance.¹⁰

In addition to these inappropriate prescribing habits of doctors, self-medication or the use of un-prescribed drugs

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is common practice around the globe.¹¹ Factors that lead to self-medication include high cost of medicines, inaccessibility to health facilities¹², having minor illness, high health care costs, lack of adequate time to visit a physician, prior experience in using a drug, and long waiting time to visit a qualified practitioner.^{13,14}

Self-medication with antibiotics ranges from 2% to 92% in different countries, with the most frequent self-medicated prescription-only medicine being antibiotics.¹⁵

In Pakistan, little research has been carried out in the past regarding antibiotics misuse by patients. By evidence the proportion of self-medicating individuals is alarmingly high.²⁴ This problem has been related to illiteracy, ignorance, lack of legislation regarding the use of prescribed drugs, poor socioeconomic status, dental phobia, no health insurance, unavailability of quality dental clinics, and availability of homeopathic drugs.²⁴ Prescription of medicines by non-doctors also contributes to the misuse of antibiotics.²⁵ This study was aimed at examining common knowledge and practices concerning usage of antibiotics among dental patients. The findings of this study may, thus, help initiate effective interventions to decrease misconceptions about the antibiotics use in the region.

METHODOLOGY

A descriptive cross-sectional questionnaire-based survey was conducted among patients presenting in Out-patient Department (OPD) of Institute of Dentistry, CMH Lahore Medical College in order to assess their knowledge and practices concerning antibiotics and its resistance. Permission was sought from the IRB (4187/IOD/CMH) before carrying out the survey.

The questionnaire was translated into Urdu and re-translated back into English and modified as required. It was then piloted on 10 patients and revised again. The purpose of this study was discussed with participants, any ambiguities cleared, and verbal consent was taken. Filled forms were collected immediately. The study included 500 respondents. All patients, age 13 and above, presenting in the OPD were included in the study. The mean age of respondents was 35.3 years (minimum age=13, maximum age=85, Table 1). There were 237 (48.2%) males and 255 (51.8%) females in the study (8 missing). The participants were divided into various groups such as; Less educated (up to matriculation level, 36.8%), More educated (above matriculation level, 63.2%), Low-income (<25000 PKR monthly, 40.1%) and High-income (25000 PKR and above monthly, 59.5%) groups (Table 1).

Data collected in this study was analyzed using IBM SPSS v23 (IBM Corp, USA, 2017). The level of statistical

significance was set at $P \leq 0.05$.

RESULTS

There were 500 respondents in this study. The mean age of respondents was 35.3 years (SD=13.3, median age=32, minimum age=13, maximum age=85, Table 1). There were 237 (48.2%) males and 255 (51.8%) females in the sample (8 missing). Participants were divided into various groups; Less educated (36.8%), More educated (63.2%), Low-income (40.1%) and High-income (59.5%) (Table 1). The most

Table 1: Demographics of study participants (missing: 8).

Participants/Gender	n (%)	Education (%)		Income (%)	
		Less educated	More educated	Low income (<25000 PKR)	High income (25000 PKR & above)
Male	237 (48.2)	15.7	32.5	20.3	32.4
Female	255 (51.8)	21.1	30.7	19.8	27.5
Total	492 (100)	36.8	63.2	40.1	59.9

frequent occupation was housewife (36.2%) followed by private job (17.2%), and self-employed (9.2%).

In the study, a vast number (82.7%) of respondents were aware of the fact that antibiotics can kill bacteria. But majority (61.8%) of the sample thought antibiotics have antiviral effects despite of any gender, education or income group ($P=0.050$, Table 2).

Three-fourth (75.5%) of the sample thought antibiotics have an analgesic effect. Significantly more of the less educated participants had this thought than more educated ones (81.8% vs. 71.8%, $P=0.049$, Table 2). Augmentin (32%) and Amoxil (24%) were the most commonly misused antibiotics for pain relief.

A large number (67.3%) of the respondents were of the view that dentists should prescribe antibiotics post-extraction where majority of the respondents were from low income group (78.3%) and seem to be unaware about the role of antibiotics after extraction of tooth/teeth (Table 2). Comparatively lesser number of respondents (38%) were of the opinion that antibiotics should be taken before going for any dental work which included significantly high number of females as compared to males (43.2% vs 32.3%, $P=0.048$) and low income group as compared to high income group (43% vs 30.2%, $P=0.021$) (Table 2).

More than half (52.8%) of the sample thought that antibiotics can cause allergic reactions including (54.2%) of more educated people (Table 2). While (54.7%) thought that antibiotics can have side effects such as diarrhea. Significantly high difference was seen among more educated people with high income as compared to less educated people with low income (58.8% vs 47.5%, $P=0.052$ and 59.8% vs 47.1%, $P=0.021$ respectively, Table 2).

Majority (74.5%) of the sample knew that unnecessary use of antibiotics can make them ineffective leading to antibiotic resistance. Significantly high frequency of the more educated and high income groups were aware of this phenomenon as compared to less educated and low income groups (79.7% vs 65.4%, $P=0.002$ and 79.8% vs 69.2%, $p=0.028$ respectively, Table 2).

In the sample, a vast number (90.7%) of respondents, despite of any gender, education or income group, were aware about the importance of completing the course of antibiotics prescribed by dentist (Table 2). But (43%) of the sample used to discontinue further antibiotics on feeling better before completion of course (Table 3).

Twenty six percent of the sample considered homeopathic

educated and low income groups as compared to the participants of more educated and more income groups (34.4% vs 21.3%, $P=0.004$ and 30.5% vs 13.6%, $P=0.000$ respectively, (Table 2). This depicts the low level of awareness among low socio-economic groups.

In the sample, (41.0%) of respondents told that they used to give the leftover antibiotics to their friends, roommates or family members if they were ever asked for (Table 3). This practice led to self-medication which was reported by (42.3%) of the total respondents (Table 3).

In the study, (41.1%) of participants had used antibiotics prescribed by pharmacists at some point in their lives, including significantly high number of males as compared to females (46.4% vs 35.9%, $P=0.016$), as well as more

Table 2: Frequency of respondents agreeing with research statements related to knowledge about antibiotics.

* indicates significant differences amongst groups.

Sr. No.	Statement	n	Overall Yes%	Gender			Education			Income		
				Male %	Female %	P value	Less educated %	More educated %	P value	< 25000 PKR %	25000 PKR & above %	P value
1	Can antibiotics kill bacteria?	497	82.7	79.3	85.3	0.123	82.0	83.3	0.101	81.0	83.7	0.101
2	Are antibiotics effective against cold and flu?	497	61.8	63.1	60.5	0.644	63.0	61.3	0.105	60.9	60.1	0.050*
3	Can taking antibiotics help reduce pain?	493	75.5	74.7	76.2	0.482	81.8	71.8	0.037*	78.3	72.3	0.099
4	After extraction of tooth, should dentist prescribe a course of antibiotics?	492	67.3	68.1	65.9	0.481	69.2	66.1	0.693	72.3	65.4	0.316
5	Should antibiotics be taken before your dental work?	487	38.0	32.3	43.2	0.048*	40.9	36.0	0.436	43.0	30.2	0.021*
6	Can antibiotics cause allergic reactions?	492	52.8	48.7	56.3	0.229	50.3	54.2	0.699	50.0	53.9	0.729
7	Can taking antibiotics have side-effects, such as diarrhea?	492	54.7	51.1	58.2	0.205	47.5	58.8	0.052*	47.1	59.8	0.021*
8	Can unnecessary use of antibiotics make them ineffective?	487	74.5	76.2	73.8	0.690	65.4	79.7	0.002*	69.2	79.8	0.028*
9	Do you think it is important to complete the course of antibiotics that the doctor has prescribed for you?	494	90.7	91.0	90.1	0.931	90.1	91.0	0.446	91.9	90.7	0.057
10	Do you think use of homeopathic medicine is more effective than antibiotics in treating infections?	496	26.0	22.1	30.0	0.135	34.4	21.3	0.004*	30.5	13.6	0.000*

Table 3: Frequency of respondents agreeing with research statements related to practices about antibiotics.

* indicates significant differences amongst groups.

Sr. No.	Statement	n	Overall Yes%	Gender (%)			Education (%)			Income (%)		
				Male %	Female %	P value	Less educated %	More educated %	P value	< 25000 PKR %	25000 PKR & above %	P value
11	Do you stop taking further antibiotics once you start feeling better before the course finishes?	495	43.0	39.8	46.2	0.209	49.2	39.8	0.117	43.1	36.3	0.188
12	Do you give the leftover antibiotics to your friend/roommate/family member if they ever ask you for them?	498	41.0	42.4	39.8	0.495	41.1	41.0	0.908	40.0	35.3	0.297
13	Have you ever used antibiotics on your own without consulting a doctor?	499	42.3	40.9	44.1	0.736	43.5	41.0	0.867	41.7	34.2	0.285
14	Have you ever used antibiotics prescribed by pharmacists?	496	41.1	46.4	35.9	0.016*	35.5	44.2	0.000*	38.3	46.7	0.073

medicine to be more effective than antibiotics for treatment of infections, with significantly more participants of less

educated and high income groups as compared to less educated and low income groups (44.2% vs 35.5%, $P=0.000$

and 46.7% vs 38.3% respectively, Table 3).

DISCUSSION

Antibiotic misuse was prevalent in the sample evidenced by the high self-medication rates (42.3%) and the use of pharmacist-prescribed antibiotics (41.1%). The misconceptions that antibiotics had antiviral (61.8%) and analgesic effect (75.5%), should be taken before any dental work (38%), and should be prescribed post-extraction (67.3%) were widespread. This might be due to inadequate knowledge regarding appropriate antibiotic usage and due to the unregulated dispensation of these drugs by pharmacies. Self-medication rates (42.3%) in the study were comparatively lower than those in the region: 92% in Kuwait¹⁸, (51%) in India¹⁹, (53%) in Iran²⁰ and (48%) in Sudan, where (76%) antibiotics were pharmacist-prescribed and (24%) were obtained from friends, family, or at home.²¹ In the US, however, the rate of self-medication is considerably lower (5%).²²

Misconception about antiviral effects of antibiotics was (61.8%) in the study and most (75.5%) of the respondents thought antibiotics had analgesic effect. A Swedish study showed that (19.1%) agreed that common colds are cured with antibiotics²³, (6.5%) in Netherlands²⁴ and (7.4%) in Australia²⁵ had similar views, but considerably lower than what has been reported from Britain (38%)²⁶, and the USA (55%).^{27,28} A Jordanian study showed (28.1%) individuals misused antibiotics as analgesics.²⁹ According to a systemic review in 2015, (50%) of the sample were not aware that antibiotics were not therapeutic for viral infections (such as flu and common cold), pain, and inflammation.³⁰

Majority of patients did not know that antibiotics can only treat bacterial infections and that they are not useful against viruses.³¹ Thus leaving them unaware about the fact that misuse of antibiotics can lead to the problem of developing bacterial resistance.³² In developed parts of the world, such as Europe, attitudes towards antibiotics were found to be influenced by country and level of education.³³ It was also found that awareness about antibiotic resistance was lagging in countries with higher prevalence of resistance.³³ In China, public, in general, was not aware of the causes of antibiotic resistance, or their role and capability in causing or preventing resistance.³⁴

The perception that homeopathic medicine is superior to antibiotics is of concern and indicates lack of trust in allopathic medicine as (26%) of the study sample considered homeopathic medicines were more effective than antibiotics for treatment of infections.

Although the study had socioeconomically diverse respondents but this may not represent the overall population

of Lahore. Because the limitation of this study was sample size that comprised of patients from single private hospital only. Respondents may also have denied self-medication or using pharmacy-prescribed antibiotics, especially if aware that this was inappropriate behavior.

Further research needs to be done on the misuse of antibiotics in the region especially by dental patients and their expectations from dentists for an antibiotic course prescription possibly leading to inappropriate antibiotic prescriptions by GDPs. A cohesive approach involving policymakers, prescribers and the general public is needed, using both educational and regulatory measures. Such measures should be embedded in the general policy by the government to change the culture of antibiotic use by improving awareness among the general public and professionals about the risks associated with antibiotic misuse, as well as reducing public misconception about the analgesic and antiviral effects of antibiotics.

Previous interventions that have successfully improved prescribing behavior among GDPs include clinical audits^{35,36} and pharmacist-delivered academic detailing.³⁷ GDPs need to accurately and extensively inform their patients with the intention of making them aware of the importance of correct behavior regarding antibiotic intake.

CONCLUSION

High self-medication rates were reported in the sample despite reasonable knowledge about antibiotic resistance and its side effects. Antibiotic misuse was widespread in the sample and may be linked to the misconception that antibiotics have an antiviral and analgesic effect.

CONFLICT OF INTEREST

None declared

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