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AWARENESS OF PRESCRIPTION GUIDELINES OF ANTIBIOTICS AMONG DENTAL SURGEONS – QUESTIONNAIRE STUDY

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ABSTRACT

In dentistry, prescribing antibiotics has become a routine aspect in recent years. Hence for limiting the antibiotic resistance pandemic, dentists must have adequate knowledge on antibiotic prescription guidelines.

Aim and objective: The present survey targets to determine and analyze the level of knowledge and attitude of Antibiotics prescription guidelines among dental surgeons.

Material and methods: 100 dental professionals with an age range of 23-40 years were included in the study. The questionnaire included 15 closed-ended, multiple choice questions. The first four questions include; general information such as gender, age, association with educational institutions, and years of clinical experience. The next eleven questions depict the attitude and awareness of Antibiotics prescription guidelines in dentistry.

Results: The study highlights the need for better education on antibiotics prescription guidelines to the dentist and dental students.

Conclusion: Majority of the participants have knowledge about antibiotic prescription guidelines, but to varying extent. The existing knowledge and approach should be improved. Continuing Education programs should be conducted to update them regularly about the newer drugs, updates on guidelines, and recent studies on the newer drugs might be of great help to the dental practitioners in limiting the antibiotic resistance pandemic.

Keywords: Antibiotic resistance, Dentist, Knowledge, Questionnaire

INTRODUCTION

In medicine field, a marvelous revolution occured right after the invention of the antibiotic "penicillin" by Alexander Fleming, a Scottish physician-scientist.[1, 2]Antibiotics revolutionized the treatment of infectious diseases, improving the patient's survival and thereby saving a million of lives in the last few decades. However, the common adverse effects of antibiotics are intestinal dysbacteriosis, antimicrobial resistance,etc leading to compromise in patient's health. [2]

In dentistry, prescribing antibiotics has become a routine aspect for prophylactic and therapeutic purposes as in treatment of both acute and chronic, focal, and systemic, odontogenic and non-odontogenic infections, and preoperative and postoperative infections coverage. It is also prescribed for the prophylaxis in high-risk category patients such as endocarditis or congenital heart disease.[2]

Literature reveals that dentists prescribe up to 11.3% of all antibiotics globally.[3-5] Koyuncuoglu et al[6] have reported that combination of Amoxicillin and clavulanic acid (58.6%) was the frequently preferred antibiotic in most clinical scenarios in dentistry. They also stated that almost three fourths of the analyzed prescription indicated inappropriate utilization of antibiotics.

In recent years the emergence of antibiotics resistance is a global threat. Several studies [2-7] and a systematic review by Contaldo[2] provides sufficient evidence that antibiotics are frequently overused and misused in dentistry. Thereby, Dentists bear the responsibility of controlling the antibiotic resistance burden by following guidelines and providing proper surveillance of the antibiotic usage and educating patients regarding adherence to prescriptions.

Hence, dentists should have essential knowledge about prescribing guidelines of antibiotics, and the antimicrobial resistance phenomenon.Therefore, we focus to determine and analyze the level of knowledge and attitude of Antibiotics prescription guidelines among dental surgeons.

MATERIAL AND METHODS

In this cross-sectional study, dentists and dental students from various clinics and institutions enrolled. The questionnaire was distributed during July 2019–December 2019 time period after ethical approval. Dental practitioners (undergraduate and postgraduate), and dental students doing compulsory rotatory internship with an age range of 23-40 years were included in the study. Students in their dental education period were excluded in the study. Prior to answering any questions, each participant gave their informed consent.

The survey included 15 closed-ended, multiple choice questions. (Table 1) The first four questions include; general information such as gender, age, association with educational institutions, and years of clinical experience. The next eleven questions possess questions evaluating the attitude and awareness of drug resistance, knowledge on newer drugs, drug availability. Last question includes twelve subheadings with yes or no type of choices. The results were computed based on the responses to the questions. Statistical analysis was done using SPSS software (version 23.0; IBM, Armonk, NY, USA).

RESULTS

A questionnaire containing 15 closed-ended, multiple-choice questions was filled in by 100 dental professionals. Majority of the study participants (62%) were aged >30 years, and 38% of them were aged less than 30 years, while 72% were females and 28% were males. 55 % of the dental professionals had greater than 10 years of clinical experience, whereas 45% had less than 10 years. 42% of the dental professionals were associated with academic institutions while 58% were not associated with academic institutions. The Frequency analysis of the different questions is mentioned in Table 2.

Fifty eight percent of the study participants prescribed Amoxicillin alone, while 28% prescribed combination Amoxicillin and metronidazole. Interestingly, four percent chose a combined course of Amoxicillin, metronidazole and other groups of antibiotics like cephalexin. Also, 78% of participants preferred a medication course for 3 days followed by 5 days (19%), and oral route (96%) was the most preferred route of administration.

Antibiotics were commonly prescribed for pericoronitis (85%), followed by intraoral swelling (82%) and extraoral swelling (81%) (Fig 1) The choice of antibiotic was based on the medical condition of the patients (53%) followed by the symptoms from which the patient is suffering from (31%). The participants suggested that antibiotics overuse (68%) is the main reason for antibiotic resistance, followed by inappropriate prescribing (17%). The results of our study shows knowledge on latest drug availability is mainly gained through medical representatives (39%), and internet (31%).

DISCUSSION

The purpose of this study was to analyze the level of dental surgeon's knowledge in prescribing and usage of antibiotics in their daily practice. A Questionnaire with 15 closed-ended, multiple choice questions were answered by 100 dental professionals. Most of the practitioners in the present study were more than 30 years of age and with more than 10 years of clinical practice. A high percentage of participants preferred a course for three days followed by five days, similar to several studies.[6-8]

Fifty eight percent of study participants preferred Amoxicillin alone, while 28% prescribed combination Amoxicillin and metronidazole. The results of the present study were similar to kaul et al[7], in which most (60%) of the participants preferred amoxicillin alone (37%) or in combination with clavulanic acid (23%) in nonallergic patients. Also, in similar studies from various geographical locations, Penicillin was the first choice of drug in Odontogenic infections.[7-11]

However, in penicillin allergic patients, clindamycin is most preferred.[12, 13]on contrary to present study, most of the participants preferred cephalexin in place of Amoxicillin. In the present study, most of the participants calculated the dosage of drugs based on age (77%), and only 20% calculated through body size. The drug dosage calculation through body surface area are more accurate, as it is paralleled with total body fluid volume and metabolic activity.[14]

In terms of duration, most participants preferred a course for 3 days, this was similar to results of various studies.[11-14] Rubenstein[15] stated that short-course antibiotic therapy administered at an optimal dose and regimen has rapid onset of action, improved bactericidal activity, better

penetration into tissues, and less chances of development of resistant microorganisms. Hence, the shortest antibiotic cycle capable of preventing both clinical and microbiological relapse is the ideal duration i.e. 3–7 days. Prolonged antibiotic courses can destroy the commensal gut flora, resulting in resistant strain and superimposed infections by multiresistant bacteria. [15-18]

In dentistry, conditions which are inflammatory in nature are commonly encountered. However, Antibiotic coverage is not required in Endodontic conditions like reversible pulpitis, irreversible pulpitis and dry sockets. The present study and other studies reported prescribing antibiotics for these conditions which is in contrary with the recommended guidelines.[18-20] The majority of participants in this study were aware of the antibiotic recommendation for cardiac conditions; prosthetic cardiac valves, surgically constructed systemic pulmonary shunt and mitral valve regurgitation, which is higher than a study conducted in Saudi. [20]

The results indicate that the majority of the dental surgeons did not adhere to the guidelines for prescribing antibiotics. Dentists must have a better understanding of antibiotic prescription indications in clinical scenarios. Also in India, dental students during their clinical training period can prescribe antibiotics under the supervision of their staff. Hence, it is necessary to train them to follow the guidelines. It is crucial to develop knowledge and attitude on antibiotic prescription during this time, as it can impact their clinical practice in future days.[20] It is also essential to provide education to the patients to strictly adhere to the prescription for the course of the treatment, and not to use antibiotics without a doctor's prescription.

In context to the patients' attitudes, a study conducted in Singapore and Philippines showed that 6.8% and 37% of the respondents give their own medications to a sick family member. [18, 19]these acts create negative responses in limiting antibiotic resistance. WHO (2000) suggested better access to medical services, reduction of unnecessary antibiotic use, and not sharing medication with others can reduce the issue of antibiotic resistance. [17]

It is essential to draw attention of whole public, including medical students, dental students, and other healthcare fields, regarding the appropriate utilization of antibiotics so that antibiotic resistance could be controlled as they play a vital role in limiting the pandemic of antibiotic resistance.[1,6,17] A nationwide large scale cross-sectional study should be carried out for generalisability of the results.

CONCLUSION

Our results conclude that most of the dental practitioners have knowledge about antibiotic prescription guidelines, but at varying extent. The existing knowledge and approach should be improved. Continuing Education programs should be conducted to update them regularly about the newer drugs, updates on guidelines, and recent studies on the newer drugs might be of great help to the dental practitioners in limiting the antibiotic resistance pandemic.

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Table-1; Questionnaire with 15 closed ended questions

S.no	**Questionnaire items**	**Choices**				
1	Age	<30 years		>30 years		
2	Sex	Male		Female		
3	Clinical experience years	<10 years		>10 years		
4	Are you associated with any academic institutions?	yes		No		
5	Did you know about antibiotic prescription guidelines	Yes	No	Not completely		
6	Most commonly prescribed antibiotics in dental practice?	Amoxicillin	Amoxiclav	Amoxicillin + Metronidazole	Cephalexin	Others
7	Minimum days of prescribing antibiotics in your daily practice?	3 d	5 d	7 d	10 d	
8	The choice of antibiotics depends on?	Suggestions from the	Medical condition of	Symptom the patient is	Patients affordab	Availability of the

		medical representative	the patient	suffering from	ility	brand
9	Antibiotics prophylaxis is recommended for all except?	Prosthetic cardiac valves	Cyanotic congenital heart disease	Surgically constructed systemic pulmonary shunt	Mitral valve prolapse with regurgitation	
10	Most important criteria in determining the dosage of a drug in the patient?	Age	Body size	Sex	Species and race	Genetics
11	Most common route of administration of antibiotics in your dental practice?	Oral	Intramuscular	Intravenous	Subcutaneous	
12	What is the method of knowing the latest drugs available?	Through medical representatives	Through internet	Reading textbooks and articles	Conferences or CDE programs	
13	Do you feel that newer drugs work better for the patients?	Yes		No		
14	Most common cause of antibiotic resistance?	Antibiotic overuse	Inappropriate prescribing	Due to various number of growing infection	Availability of few newer antibiotics	
15	Which is the most common dental condition where antibiotics are prescribed? a. Pulpitis b. Acute facial swelling c. Pericoronitis d. Dental trauma e. Dry sockets f. Endodontics procedures g. Orthodontic extraction	Yes		No		

	h. Dental implants i. Acute periodontitis j. Localized intraoral swelling k. Extraction by open methods l. Scaling		

Table-2; Responses on questions by the study participants

	Questionnaire	Responses	Frequency N %
1	Age	<30 years	38
		·> 30 years	62
2	Gender	Male	28
		Female	72
3	Years of dental practice	<10 years	45
		< 10 years	55
4	Association with institution	Yes	42
		No	58
5	Did you know about antibiotic prescription guidelines	Yes	53
		No	8
		Not completely	39
6	Minimum days of prescribing antibiotics in your daily practice?	3 d	78
		5 d	19
		7 d	3
		10 d	0
7	Most commonly prescribed antibiotics in dental practice?	Amoxicillin	57
		Amoxiclav	9
		Amoxicillin + metronidazole	28
		Cephalexin	1

		Others	5
8	The choice of antibiotics depends on?	Suggestion from medical representatives	4
		Medical condition of the patient	53
		Symptom patient is suffering from	31
		Affordability of the patient	4
		Availability of the brand	4
		Option b and option c	2
		Option c and option d	1
		Option b, c and d	1
9	Antibiotics prophylaxis is recommended for all except?	Prosthetic cardiac valve	14
		Cyanotic congenital heart disease	30
		Surgically constructed systemic pulmonary shunt	25
		Mitral valve prolapse with regurgitation	31
10	Most important criteria in determining the dosage of a drug in the patient?	Age	77
		Body size	20
		Sex	0
		Species and race	0
		Genetics	1

		Option a+b	2
11	Most common route of administration of antibiotics in your dental practice?	oral	96
		Intravenous	2
		Intravenous	2
		Subcutaneous	0
12	What is the method of knowing the latest drugs available?	Through medical representatives	39
		Through internet	31
		Textbook and articles	12
		Conference and CDE	12
		Combination of above options	6
13	Do you feel that newer drugs work better for the patients?	Yes	69
		No	31
14	Most common cause of antibiotic resistance?	Overuse	68
		Inappropriate prescription	17
		Growing infection	8
		Newer drugs	3
		Combination of other options	4
15	Which is the most common dental condition where antibiotics are prescribed?	Pulpitis	57
		Acute facial swelling	82
		Pericoronitis	85

		Dental trauma	56
		Dry sockets	59
		Endodontics procedures	63
		Orthodontic extraction	50
		Dental implants	66
		Acute periodontitis	62
		Localized intraoral swelling	82
		Extraction by open methods	81
		Scaling	4

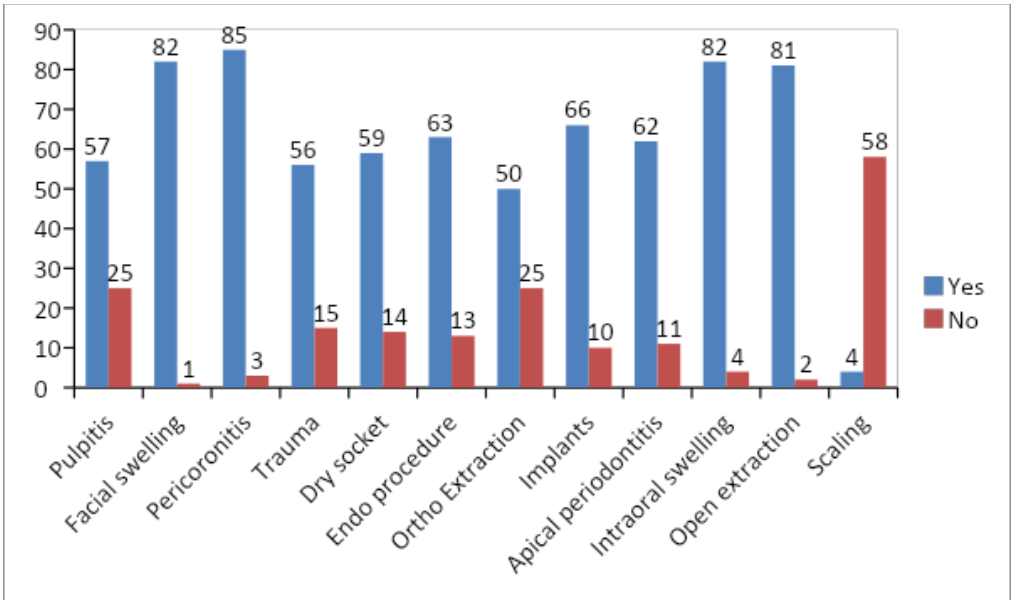

Fig 1; Responses to question no 15; Which is the most common dental condition where antibiotics are prescribed?