



COMPLIANCE OF DENTAL STUDENTS AND DENTAL PRACTITIONERS WITH ANTIBIOTIC PRESCRIBING GUIDELINES FOR DENTAL INFECTIONS IN CHILDREN- A CROSS-SECTIONAL STUDY

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ABSTRACT **Introduction:** Antibiotics when prescribed correctly are very beneficial to cure bacterial infections, but its extensive use has led to its resistance. Many microorganisms have developed multidrug resistant strains while some microorganisms have developed resistance to a single antimicrobial agent because of the repeated use in some unwarranted situations. **Aim & objectives:** To identify the antibiotic prescribing training received by the dental students and the awareness of antibiotic prescribing guidelines among dental students and dental practitioners. To assess awareness of antibiotic resistance and its misuse. **Methodology:** A cross sectional study was conducted involving dental students and dental practitioners in which 700 self administered questionnaire involving multiple choice, closed ended and open ended questions. **Conclusion:** According to our study there was low awareness of professional guidelines and compliance with guidelines in third and final year students. To improve standards of care, dentists need to be up-to-date in their knowledge of pharmacology.

KEYWORDS : antibiotics, antibiotic prescribing guidelines, antibiotic resistance, overusage

INTRODUCTION

Whether go to a physician or dental practitioner "Antibiotic" is always prescribed along with the other medication as it is believed that it cures all types of infections.

When prescribed correctly, the antibiotics are very beneficial to cure bacterial infections, but its extensive use has led to its resistance.¹ Many microorganisms have developed multidrug resistant strains while some microorganisms have developed resistance to a single antimicrobial agent because of the repeated use in some unwarranted situations.^{1,2} There are many factors that causes this antibiotic resistance phenomenon including the routine use of antibiotics in agriculture resulting in potential direct infection.¹ Dentists can play an important role in minimizing the inappropriate use of antibiotics by prescribing the correct drug, at the standard dosage thereby helping to reduce the development of antimicrobial resistance.¹

Administration of antibiotics in pediatric patient is done mainly for the control of dental infections. There are still many dental practitioners who lack proper training for prescribing the antibiotics.¹

In dental practice the antibiotics are prescribed for two reasons i.e. prophylactic and therapeutic. Prophylactic antibiotics are used to prevent the diseases which are caused by the oral microflora whereas therapeutic use is to treat the diseases of hard and soft tissues of the oral cavity.²

To determine the appropriate dosage for the pediatric patients number of formulas has been used throughout the years.³ As for the proper use of the antibiotics, American Academy of Pediatric Dentistry (AAPD) has published certain guidelines. There is special dosage requirement for pediatric patient according to their body weight.³

According to some researchers it is crucial to develop appropriate teaching curriculum for the undergraduate students for the appropriate and judicious use of antibiotics.¹

AIM & OBJECTIVES

- To identify the antibiotic prescribing training received by the dental students.

- To identify the awareness of antibiotic prescribing guidelines among dental students and dental practitioners.
- To identify the awareness of antibiotic resistance among dental students and dental practitioners.
- To identify the misuse and overusage of antibiotics.

MATERIALS AND METHODS

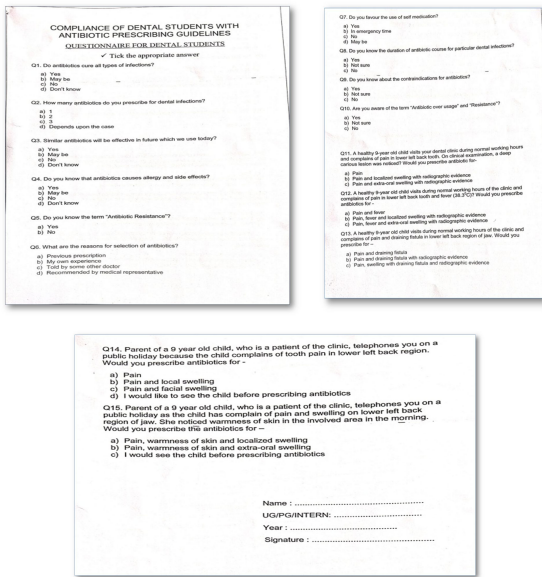
A cross sectional study was conducted involving dental students and dental practitioners in which 700 self administered questionnaire involving multiple choice, open ended and close ended questions were given to both dental students (550) and dental practitioners(150). Of the 550 questionnaires distributed to dental students 4 refused to participate, 8 were lost and 8 were incomplete. Similarly of the 150 questionnaires distributed to the dental practitioners 9 refused to participate, 5 were lost and 4 were incomplete.

Dental students' responses were compared for each clinical case scenario. Compliance for each scenario was tested for association with their knowledge in antibiotic prescribing, previous training on antibiotic prescribing and awareness of antibiotic prescribing guidelines. Responses from dental practitioners were compared to evaluate the antibiotic prescription pattern and awareness of antibiotic resistance and over-usage.

Fig1. Questionnaire for dental practitioners

COMPLIANCE OF DENTAL PRACTITIONERS WITH ANTIBIOTIC PRESCRIBING GUIDELINES	
NAME: _____	
QUALIFICATION: _____	SPECIALITY: _____
WORK EXPERIENCE: _____	
QUESTIONNAIRE FOR DENTAL PRACTITIONERS	
✓ Tick the appropriate answer	
Q1. Do you routinely prescribe antibiotics for _____	
a) Inevitable injuries	Yes/No
b) Inevitable injuries	Yes/No
c) Inevitable injuries from heat	Yes/No
d) Extraoral abscess when treat	Yes/No
e) Dental trauma	Yes/No
f) Extraoral abscess	Yes/No
g) Periodontal disease	Yes/No
h) Extraction	Yes/No
Q2. What are your commonly prescribed antibiotics? A) _____	
B) _____	
C) _____	
Q3. What is the duration of antibiotic course? A) 3 days	
B) 5 days	
C) More than 5 days	
Q4. What is your prescription of amoxicillin infection? A) _____	
B) _____	
C) _____	
What is the duration of antibiotic course? _____	
Q5. Are you aware of the current guidelines for "Antibiotic prescription" and do you follow the same? Yes/No	
Q6. Do you prescribe prophylactic antibiotics for cardiovascular diseases? Yes/No	
Q7. Are you aware of the term "Antibiotic Resistance"? Yes/No	
Q8. Do you think that self-medication of antibiotics by patients is a good habit and is responsible for the antibiotic resistance? Yes/No	
Q9. Do you require from your patient about whether he/she has already taken antibiotic course before coming to your clinic? Yes/No	
Q10. Do you advise your patient to adhere to the dose regimen and duration (intermittence) of that drug use? Yes/No	
Q11. Are you aware of guidelines for "Antibiotic Prescription"? Yes/No	
Q12. Do you prescribe antibiotics to the patient if she/he asks you to do so to avoid the treatment? Yes/No	

Fig.2. Questionnaire for dental students



Training received for antibiotic	Pearson Correlation	1	.061	-.060	.010
	Sig. (1-tailed)		.269	.273	.461
	N	105	105	105	105
Similar antibiotic affect in future	Pearson Correlation	.061	1	.047	-.003
	Sig. (1-tailed)	.269		.317	.490
	N	105	105	105	105
Number of Antibiotic Prescribed for dental infection	Pearson Correlation	-.060	.047	1	-.083
	Sig. (1-tailed)	.273	.317		.200
	N	105	105	105	105
Antibiotic Causes Allergy	Pearson Correlation	.010	-.003	-.083	1
	Sig. (1-tailed)	.461	.490	.200	
	N	105	105	105	105

Inference:-

From the above tables it can be said that training received to dental students regarding antibiotics and its correlation with the awareness level of students with respect to the weather similar antibiotic can be prescribed in future which is prescribed today to patient is positively correlated with a value of 0.061. There is negative correlation (-.060) between the training given to dental students with respect to numbers of antibiotic prescribed by dental students to patient. The correlation between the training received by dental students with whether antibiotic cause allergy or not is positive correlated (010).

Key result Significant Value: - In these result the p- value for the correlation between different variables are more than significant level 0.05 which indicates that correlation coefficients are not significant in variables.

RESULTS

Table A: Responses from dental students

Question number	Option "A"	Option "B"	Option "C"	Option "D"
1	150 (28.57%)	90 (17.14%)	285 (54.28%)	--
2	135 (25.71%)	180 (34.28%)	30 (5.71%)	180 (34.28%)
3	105 (20%)	195 (37.14%)	225 (42.85%)	--
4	480 (91.42%)	45 (8.57%)	--	--
5	480 (91.42%)	45 (8.57%)	--	--
6	165 (31.42%)	135 (25.71%)	90 (17.14%)	135 (25.71%)
7	120 (22.85%)	45 (8.57%)	330 (62.85%)	30 (5.71%)
8	315 (60%)	180 (35.28%)	30 (5.71%)	--
9	405 (77.14%)	90 (17.14%)	15 (2.85%)	--
10	390 (74.28%)	45 (8.57%)	90 (17.14%)	--
11	270 (51.42%)	135 (25.71%)	105 (20%)	--
12	105 (20%)	285 (54.28%)	135 (25.71%)	--
13	60 (11.42%)	135 (25.71%)	330 (62.85%)	--
14	60 (11.42%)	15 (2.85%)	150 (28.57%)	315 (60%)
15	75 (14.28%)	135 (25.71%)	315 (60%)	--

Table B: Responses from dental practitioners

QUESTION NUMBER	YES	NO
Q1.(a)	18 (13.63%)	114 (86.36%)
Q1.(b)	78 (59.09%)	54 (40.90%)
Q1.(c)	114 (86.36%)	18 (13.63%)
Q1.(d)	126 (95.45%)	6 (4.54%)
Q1.(e)	114 (86.36%)	18 (13.63%)
Q1.(f)	114 (86.36%)	18 (13.63%)
Q1.(g)	114 (86.36%)	18 (13.63%)
Q1.(h)	108 (81.81%)	24 (18.18%)
Q 3.	102 (77.27%)	30 (22.72%)
Q 5.	120 (90.90%)	12 (9.09%)
Q 6.	126 (95.45%)	6 (4.54%)
Q 7.	132 (100%)	0 (0%)
Q 8.	126 (95.45%)	6 (4.54%)
Q 9.	132 (100%)	0 (0%)
Q 10.	132 (100%)	0 (0%)
Q 11.	126 (95.45%)	6 (4.54%)
Q 12.	30 (22.72%)	102 (77.27%)

STATISTICAL ANALYSIS

Table C: Dental student analysis

Correlations of Training received to dental students regarding antibiotic and their level of awareness				
Particulars	Training received for antibiotic	Similar antibiotic affect in future	Number of Antibiotic Prescribed for dental infection	Antibiotic causes allergy

Table D: Dental Practitioner Analysis

Experience in numbers of years of Dental Practitioners

Particulars	Frequency	Percent	Valid Percent	Cumulative Percent
0-1 Year	19	28.4	28.4	28.4
2-3 Year	26	38.8	38.8	67.2
4-5Year	13	19.4	19.4	86.6
5-6 year	7	10.4	10.4	97.0
more than 6 years	2	3.0	3.0	100.0
Total	67	100.0	100.0	

Source: - Primary data

Inference:- from the collected data it was observed that maximum number of dental practitioner having 2-3 year of experience i.e 38.8% after that 28.4% of practitioner having 0-1 year of experience, 19.4% of the respondent having 4-5 years of experience, 10.4% of the respondent having 5-6 years of experience and at last 3% of the respondents having more than 6 years of experience.

Table E: Pearson Chi- square Test Work Experience with Routinely Prescribed antibiotics

Particulars	Reversible Pulpitis	Irreversible Pulpitis	Intraoral Drain ing Sinus tract	Extraoral Drain ing Sinus tract	Dental trauma	Intraoral Swelling	Extraoral welling	Pediatric Periodontal disease	Extraction
Chi Square	5.820	11.991	1.524	2.681	5.822	13.960	4.557	2.807	2.950
DF	4	4	4	4	4	4	4	4	4
Sig	.213	0.17	.822	.613	.007	.007	.336	.591	.566

Inference: - Here in the above table chi square test is used to understand the relationship between work experiences of Dental Practitioners with respect to routinely prescribed antibiotics. The p-value was as 0.05 as significant. Here in above cases the P value in all

cases is greater than 0.05 (Null hypothesis accepted) we can conclude that there is no association between the work experience of doctor with respect to routinely prescribed different antibiotics.

DISCUSSION

According to our study, the dental students require appropriate training in their curriculum regarding the use of antibiotics. They should be aware about the guidelines of the antibiotic prescription as well as the conditions when they should be prescribed. Also they should know about the recent antibiotics available with their brand names as well as the combination. Mostly the third year and final year students were not confident in antibiotic prescription and the responses in clinical scenario questions as compared to interns and postgraduate students.

According to Peedikayil FC, To improve standards of care, dentists need to be up-to-date in their knowledge of pharmacology in dental education, as well as in the continuing education, with a continuous assessment of dental practices, a better understanding of the pathogenesis of these infections, including the host immune response to bacteremia, along with prospective clinical trials, which will allow for more evidence-based decisions.²

According to our study, most of the dental practitioners routinely prescribe antibiotics for extraction as well as irreversible pulpitis. According to the Guidelines on Use of Antibiotic Therapy for Pediatric Dental Patients, only selected form of periodontal disease in children requires the use of antibiotics.⁵ There is no association between the experience of Dental Practitioners and routinely prescribed antibiotics. The ideal duration of antibiotic treatment is the shortest cycle capable of preventing both clinical and microbiological relapse. Appropriate and correct use of antibiotics is essential to ensure that effective and safe treatment is available. Practices that may enhance microbial resistance should be avoided.²

CONCLUSION

According to our study there was low awareness of professional guidelines and compliance with the guidelines in third year and final year students. Separate training is required for the antibiotic prescription, so that the future dentists who will be serving our community will ensure the effective and safe treatment with the appropriate and correct use of antibiotics. To improve standards of care, dentists need to be up-to-date in their knowledge of pharmacology in dental education, as well as in the continuing education, with a continuous assessment of dental practices, a better understanding of the pathogenesis of these infections, including the host immune response to bacteraemia, along with prospective clinical trials, which will allow for more evidence-based decisions.

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