Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 11, pp.61556-61559, November, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

KNOWLEDGE ABOUT ANTIBIOTIC PRESCRIPTION AMONG DENTAL UNDERGRADUATE STUDENTS IN SAUDI ARABIA

***,[1]Dr. Sandeepa, N. C., [1]Dr. Muhammed Ajmal, [2]Safeyah Abdurrahman Alqarni and [2]Mashael Khaled Al-Thobati**

[1]Assistant Professor, DDS, King Khalid University-COD, ABHA, KSA
[2]Dental Intern, King Khalid University-COD, ABHA, KSA

ARTICLE INFO

Article History:

Received 15th August, 2017
Received in revised form
26th September, 2017
Accepted 25th October, 2017
Published online 30th November, 2017

Key words:

Antibiotic prescription,
Dental undergraduates.

ABSTRACT

Objective: Antibiotics are frequently prescribed in dentistry as a prophylaxis and/or for the management of infections in the oro-facial regions. It is known that indiscriminate usage of antibiotics often can lead to development of resistance and thus the topic is receiving a great deal of consideration in the literature. Most of the studies are conducted among dentist and was found that overuse and abuse of antibiotics are practiced. It is very important that dental students are cognizant and well-informed regarding antibiotics. The difficulties if identified during their undergraduate level can be used to improve their skill of prescription and thus avoid overuse of antibiotics in their future clinical set up. This research aim toassess the knowledge of dental undergraduates regarding the use of antibiotics in various clinical conditions, antibiotic prophylaxis and the problems encountered in writing the prescription.

Method: Both male and female students of level 10, 11, and 12 students of King Khalid University – College of Dentistry were selected for the study. Questionnaire was used and the responses were analyzed.

Results: Most common error faced during prescription was, not knowing the brand names and dosage. Only 40% students think that antibiotics have to be prescribed when there is evidence of systemic spread. 53.4% students consider antibiotics to prevent post-operative complications. 16.5% consider prescription when specific treatment has to be delayed and when there is patients' expectation for a prescription. 18.3% consider antibiotic before any surgical procedure. 12.3% think that antibiotics have to be given in acute pulpitis and 28.5% believe that it has to be given in acute infection before drainage. 13.4% consider antibiotics in routine extractions. Satisfactory knowledge regarding the various situations where antibiotic prophylaxis is used was lacking. Majority think that there is need to conduct a workshop on rational use of antibiotics at University.

Conclusion: Though majority have responded satisfactorily, there is a requirement for the development of prescribing guidelines and educational initiatives regarding sensible and right use of the antibiotics and has to be stressed to dental undergraduates within schools for refining the present scenario.

Citation: Dr. Sandeepa, N. C., Dr. Muhammed Ajmal, Safeyah Abdurrahman Alqarni and Mashael Khaled Al-Thobati, 2017. "Knowledge about antibiotic prescription among dental undergraduate students in Saudi Arabia", *International Journal of Current Research, Vol. 9, Issue, 11, pp.61556-61559, November, 2017*

INTRODUCTION

There is growing reports concerning overprescription of antibioticsby dental practitioners and its role in worldwide problem in antibiotic resistance. (Cope and Chestnutt, 2014) Though the number of prescriptions by the dentist is not comparable to the medical practitioners, imprudent use of certain antibiotics is significant. (Epstein and Chong, 2000) 7-11% of antibiotics prescribed by dentist include penicillins, metronidazole, clindamycin and tetracycline (Dar Odeh *et al*., 2010). Out of the total prescriptions, metronidazole itself accounts for 40% (Haroni, 2008). The possibility of indiscriminate prescription of antibiotics by dentists is probably higher in KSA in which dentist are legally entitled to prescribe antibiotics with little restriction (Ministry of health, 2012). The clinical dental students represent a highly educated group of medical personnel and their knowledge in relation to public practice of antibiotics can greatly influence in the future on antibiotic-related questions. The present study was an effort to know the dental students' acquaintance on clinical use of antibiotics in dental conditions and also was focused on their alertness on antibiotic prophylaxis.

Corresponding author: **Dr. Sandeepa, N. C.**
Assistant Professor, DDS, King Khalid University-COD, ABHA, KSA.

MATERIALS AND METHODS

The objectives of the present study were the following

1. To assess the knowledge of dental undergraduates regarding the use of antibiotics in various dental clinical conditions.
2. To assess the knowledge of dental undergraduate students about antibiotic prophylaxis
3. To assess the problems encountered by the students in writing the prescription

Before the commencement of study, the protocol was accepted by the Ethical Committee of King Khalid University-College of Dentistry.Questionnaire was formulated to examine dental undergraduate's knowledge regarding antibiotic prescribing patterns. This questionnaire was a modification of that described by Palmer *et al*. (2000). Information was sought on the most common antibiotic used in clinic and the most common difficulty they faced during prescription writing. The questionnaire also investigated for which clinical signs the student would prescribe antibiotics. The clinical signs chosen were elevated temperature, evidence of systemic spread, localized fluctuant swelling, gross diffuse swelling, restricted mouth opening, difficulty in swallowing and closure of the eye because of swelling. Information was also pursued on a number of non-clinical factors to determine if they affected prescription pattern. Specifically, questions wereasked whether or not the patient's expectation of an antibiotic prescription, pressure of time and workload, the patient's social history, uncertainty of diagnosis, or if treatment had to be delayed would cause an antibiotic to be prescribed. Information was sought on the practice of antibiotics for common clinical conditions. The clinical conditions were acute pulpitis, acute periapical infection (before, with or after drainage), chronic apical infection, pericoronitis, cellulitis, periodontal abscesses, acute ulcerative gingivitis, chronic marginal gingivitis, sinusitis, chronic periodontitis, dry socket, trismus and reimplantation of teeth.Questionnaire also assessed their knowledge regarding antibiotic prophylaxis. Prepared Questionnaires for this study were distributed to students of level 10, 11, and 12 students. Both male and female students of level10, 11 and 12 students participated in the study. These higher-level students were selected because they deal with all the complicated surgical, endodontic and periodontal procedures by then. The questionnaires were analyzed and the responses to each question were expressed as absolute frequencies.

RESULTS

Male students participated were 54.4% and 45.6% were females of the respondents. Level 10 students comprised of 31.1%. 27.8% were level 11 students and 41.1% were level 12 students. The most common antibiotic prescribed in clinics was amoxicillin (99.4%) followed by clindamycin, metronidazole (4.4%), cephalosporin (1.1%) and erythromycin (0.6%). Most common error faced during antibiotic prescription was not knowing the brand name of the drug (29.4%). 27.8 %of the students were finding difficulty in dosage of the drug. 20.6% were not able to select the appropriate antibiotics to be prescribed. 17.2% do not enquire about drug allergy before prescription. 8.9% of students had uncertainty about duration of the prescribed drug. (Table 1) 73.2% of students depend on the clinic supervisor instruction for prescription. 17.3% apply the information they learnt in pharmacology course and 12.8% refer pharmacology books. 7.8% depend on classmates for prescription writing. Non-clinical factors influencing the prescription pattern were included andquestionedthe students. 53.4% would consider antibiotics to prevent post-operative complications. When specific treatment has to be delayed and when patient expects for a prescription, 16.5 % students would consider prescription of antibiotics .11.4% consider giving antibiotics when diagnosis is not certain. (Table 2) Common clinical signs and conditions were mentioned in the questionnaire and students were asked about the need of antibiotics in the presence of these signs along with appropriate treatment. 41.1% students understood the need of giving antibiotics in the presence of elevated temperature with evidence of systemic spread. 46.1% students knew that when gross or diffuse swelling antibiotics need to be given. 18.9% consider antibiotics when there is localized fluctuant swelling. When there is closure of eye due to swelling, only 17.2 %would consider antibiotics. When there is restricted mouth opening and difficulty in swallowing 13.9 and 14.4 % students would consider antibiotics respectively. (Table 3)

Table 1. Most common error faced during prescription

Wrong posology (dosage)	27.8
Not knowing the brand names	29.4
Not knowing what to prescribe	20.6
Wrong treatment duration	8.9
Not asking the patient about allergies	17.2
Not giving a prescription	8.3

Table 2. Knowledge of antibiotics use in non-clinical conditions

Situations	Correct answer	Percentage
Patient's expectations for a prescription	No	83.5
Convenience	No	94.3
Patient's social background	No	93.7
Diagnosis not certain	No	88.6
Pressure of time and workload	No	96.6
Specific treatment has to be delayed	No	83.5
Prevention of postoperative complications	No	46.6

Table 3. Knowledge of use of antibioticsin specific clinical signs

Clinical signs	Correct answer	Percentage
Elevated temperature with evidence of systemic spread	Yes	41.1
Localized fluctuant swelling	No	81.1
Gross or diffuse swelling	Yes	46.1
Restricted mouth opening	Yes	13.9
Difficulty in swallowing	Yes	14.4
Closure of the eye due to swelling	Yes	17.2

Table 4. Knowledge of antibiotics use in clinical conditions

Clinical cases	Correct answer	Percentage
Acute pulpitis	No	87.7
Acute infection before drainage	No	71.5
Acute infection with drainage	No	82.7
Acute infection after drainage	No	71.5
Chronic apical infection	No	76.5
Periodontal abscess	No	65.9
Acute ulcerative gingivitis	Yes	20.7
Chronic marginal gingivitis	No	95.5
Chronic periodontitis	No	94.4
Pericoronitis	No	81.6
Cellulitis	Yes	53.6
Dry socket	No	78.8
Routine extraction	No	86.6
Re implantation of teeth	Yes	11.7
Scaling and polishing	No	98.9
Restorative treatment	No	99.4

Table 5. Knowledge on prophylactic prescription

Conditions	Correct answer	Percentage
All the patients planned for any surgical procedure	No	81.7
HIV+ patients	Yes	34.4
Well controlled diabetic patients	No	93.9
Non-controlled diabetic patients	Yes	22.8
Unrepaired cyanotic Congenital Heart disease	Yes	43.9
Renal patients undergoing dialysis with shunts	Yes	21.7
Patients with pacemaker	No	62.2
Patients with prosthetic heart valve	Yes	43.9

Students were asked about the different clinical cases where they would consider prescription of antibiotics. 53.6% would consider antibiotics when there is cellulitis. 78.8% said that there is no need of antibiotic in dry socket but 21.2% would consider antibiotics in this condition. 87.7% do not consider when patient has acute pulpitis. Majority said that they would not consider antibiotics when there is localized periapical infection for which when appropriate treatment is planned as in case of drainage. 28.5% would consider antibiotics before drainage or after drainage of acute infection.13.4% responded that antibiotics to be given in routine extractions. 76.5% would not consider antibiotics in chronic apical infections, yet few (23.5%) responded that antibiotics are necessary for chronic infection. 4.5% had an opinion that antibiotics are to be given in chronic marginal gingivitis. 65.9% had an opinion that antibiotics are not required for periodontal abscess. 5.6% students consider in chronic periodontitis. Only 11.7% knew that antibiotics are required for reimplantation of teeth. Only 20.7% students would consider antibiotics in ANUG. (Table 4) Regarding antibiotic prophylaxis, 18.3% think that antibiotics should be given for all patients who are planned for any surgical procedure. Only 22.8% think that antibiotics are required for non-controlled diabetes mellitus patients. 62.2% knew that prophylaxis is not needed for patients with pacemaker but 37.8% said that they will opt prophylaxis for these patients. Only 43.9% consider antibiotics in unrepaired congenital heart disease patients. 6.1% prescribe antibiotics for well controlled diabetic patients as prophylaxis. 31.1% consider antibiotics when the patients have compromised immune system. When enquired about the antibiotics resistance, 87.6% responded that they do consider antibiotics resistance when prescribing antibiotics. 63.3% are aware ofdrug interactions with the antibiotics they prescribe. 77.5% agree that there is abuse on antibiotics at present. 85.6% agree that antibiotics abuse is the main cause for antibiotics resistance. 86.1% feel necessary that there is need for more education on antibiotics. 87.2% have an opinion that that there is a need to conduct a workshop onrational use of antibiotics atuniversity

DISCUSSION

In 2011, WHO set the theme of World Health Day as‘Combat Antimicrobial Resistance: No Action Today, NoCure Tomorrow’ (World Health Day, 2011). This echoes the seriousness of this globalissue of antibiotic abuse and thus there is growing agreementfor evolvingnewapproaches for preventionof bacterial resistance to antibiotics. An increasing number of researchers have been attentive on antibiotic misuse in current years (Andre *et al*., 2010). The present study was an attempt to recognize the dental students’ knowledge concerning clinical use of antibiotics in dental conditions. We focused on dental students as most of the researches were focused on dentists and it was found that there are lot of abuse and overuse of antibiotics. Most common error faced by the students during writing antibiotics prescription were not knowing drug dosage and unaware of brand names. Though this was a minor percentage compared to the literature, this problem can be solved by repeated orientation during clinical sessions. It is of interest and equally satisfying to note that majority of the respondents would not prescribe antibiotics for unscientific reasons like patient’s expectation of an antibiotic prescription, convenience, pressure of time and workload, demand imposed by the social background of the patients. Only a small fraction of the respondents would indulge insuch practices, which can result in an irrational, and abuse of antibiotic practice. Our figures also presented that only a low proportion of the students would prescribe antibiotics when the diagnosis is uncertain.

One of the main aspects was the use of antibiotics to prevent postoperative complications. 46.6% had an opinion that antibiotics are not required for prevention of post-operative complications. Rest of the respondents would consider antibiotics for the prevention. Researches involving dental practitioners were also shown that despite abundant evidence in the literature,which suggests that antibiotics should not be usedas a substitute for good surgical and as epticoperative techniques, over four-fifth of the dentists would give prophylactic antibiotic cover for the prevention of postoperative infection subsequent to surgical dental managements. (Newman *et al*., 2000) This clearly indicates that these areas to be stressed in the student curriculum. Some of the significant clinical signs of infections were mentioned and the need of antibiotics were asked in the presence of these signs, along with appropriate therapy. Though 41.1% knew the need of medication in the presence of elevated temperature, other signs which warrants antibiotics were not answered by the majority. 13.9%, 14.4%,17.2% of the respondents would knew the use of antibiotics in situations like restricted mouth opening, difficulty in swallowing and closure of eye due to swelling. Common clinical conditions and the use of antibiotics in such cases were included in the questionnaire. Acute pulpitis, chronic marginal gingivitis and chronicperiodontitis are conditionswhere antibiotics are not indicated. Above 75% Students responded correctly the use of antibiotics in these situations. The study showed that students would consider overuse of antibiotics inprocedures such as routine extraction (13.4%) and scaling (1.1%) which actually do not necessitate the need of antibiotics.Incidence of wound infection following extraction is about 3% which is a low incidence to validate the routine use of prophylactic antibiotics. (Zeitler, 1995)

A study by Rud also recommended that the practice of prophylactic antibiotics deliberates no benefit, even in the presence of pericoronitis or acute ulcerative gingivitis, the impacted tooth is surgically extracted. (Martin *et al*., 2000) Unless there is a systemic involvement, management of uncomplicated abscesses is effective drainage and elimination of the cause. In majority of localized ordiffuse dental infection, removal of thecourse and/or drainage would usually lead to a complete resolution of the problem. However, insome conditions, drainage or removal of the cause if not achievable immediately and especially when there is an evidence of systemic involvement, antibiotic use can be advised to prevent

or limit local and metastatic spread of infection. (Martin *et al*., 2000) In case of our study, above 70% of respondents agreed that antibiotics are not required for localized infections. In case of localized infections and chronic cases of oral conditions, students responded satisfactorily as majority knew the need of avoiding the use of antibiotics in the above conditions. Though they identified the conditions where antibiotics are not required, some of the clinical conditions which require antibiotics such as ANUG and reimplantation of teeth were not answered by majority. It was only 20.7 and 11.7% recognized that antibiotics are required in these situations. Knowledge about prophylactic prescription was assessed. Some of the conditions of the patients which may warrant use of prophylactic antibiotics were included in the options. Though they responded well wherein antibiotics prophylaxis is not required, some of the special situations where prophylactic prescription is needed were not responded by majority.

Attempts atproviding an evidence-based protocol has led tomany guidelines being produced by different countries thereby creating confusion on the use of antibiotics in dentistry. However, the clinical use of antibiotics in many specific clinical situations appears to follow existing guidelines although, a new antibiotic policy or guideline is needed thatwould be strictly followed and taught to the students.The scenario should be followed in the clinical sessions so that dental students are acquainted well and there is less chance to practice overuse of antibiotics in their future clinical set up. There is also a need for regular continuing dentaleducation courses in the use of antibiotics in dentalpractice and regular update of knowledge in this area in their internship as well. This will reinforce the situation.

Conclusion

In conclusion, this is the first study among dental students regarding the knowledge of antibiotic prescription in various clinical situations. Based on our results, certain zones have to be concentrated to get the best result which will automatically improve the practice of dentist in their clinical set up.The results of the present studyhave demonstrated a lack of uniformity in the knowledge of rational use of antibiotic use among dental students in Abha. Though majority have responded satisfactorily, there is a requirement for the development of prescribing guidelines and educational initiatives regarding sensible and right use of the antibiotics and has to be stressed to dental undergraduates within schools for refining the present scenario. There should be focus on research testing the efficacy of teaching topicsin universities to improve the outcome of practicing professionals.

REFERENCES

Andre M, Vernby A, Berg J, Lundborg CS. 2010. A survey of public knowledge and awareness related to antibiotic use and resistance in Sweden. *J Antimicrob Chemother*, 65(6):1292–1296.

Cope AL, Chestnutt IG. 2014. Inappropriate prescribing of antibiotics in primary dental care; reasons and resolutions *Prim Dent J*., 3(4):33-37

Dar Odeh NS, Abu Hammad OA, AlOmiri MK, Khraisat AS, Shehabi AA. 2010. Antibiotics prescribing practices by dentists, a review *TherClin Risk Manag*., 6:301-306

Epstein JB, Chong S, Le ND. 2000. A survey of antibiotic use in dentistry, *Jam Dent Assoc*., 131(11):1600-1609

Haroni M. 2008. Bacterial resistance and the dental professional's role to halt the problem, *J Dent*., 36(2): 95-103

Martin MV, Longman LP, Palmer NAO. 2000. Adult antimicrobial prescribing in primary dental care for general dentalpractitioners. Faculty of general dental practitioners, UK: The Royal College of Surgeons of England.

Ministry of health, Ministry of Health Formulary Drug List Health Minister Advisor of Capital Investment Riyadh, Saudi Arabia 2012 p 1-12

Newman MG, Van Winkeltoff AJ. 2000. Antibiotic and antimicrobial use in dental practice, 2nd ed. Illinois: Quintessence Publishing Co. Inc. 157—255

Palmer N. A. O, Pealing 1 R., Ireland R. S, Martin M. V. 2000. A study of therapeutic antibioticprescribing in National Health Servicegeneral dental practice in England. *Br Dent J*., 188: 554–558

Rud J. 1970. Removal of impacted third molars with acute pericoronitis and narcotizing gingivitis. *British Journal of Oral Surgery*, 7:153—60.

World Health Day 2011-Antibiotic resistance: No action today, no cure tomorrow.[http://www.who.int/mediacentre/news/statements/2011/whd_20110407/en/index.html]

Zeitler DL. 1995. Proplylactic antibiotics for third molars surgery. A dissenting opinion. *Journal of Oral and Maxillofacial Surgery*, 25:61—4.

****