

DRUG PRESCRIPTION AMONG DENTAL STUDENTS: A SURVEY OF CURRENT KNOWLEDGE AND AWARENESS

¹HINA ASHRAF, ²MEHWISH PASHA, ³MALEEHA NAYYER, ⁴AYESHA ASLAM, ⁵MUHAMMAD KALEEM

ABSTRACT

The goal of this cross-sectional study was to assess the knowledge and awareness of drug prescription among the dental students of Rawalpindi. A questionnaire having 16 close ended questions having equal number of options pertaining to the indication, dosage and duration (number of days) of pain relievers and antibiotics were distributed among 195 students. A significant association was found between frequently encountered dental health conditions and categories of respondents ($p=0.03$). There were three categories of respondents; third year, fourth year and house officers. The questionnaire was distributed among the respondents of Armed forces institute of Dentistry (AFID), Army medical college (AMC) and Margalla institute of health sciences (MIHS) in Rawalpindi. The house officers undoubtedly wrote the maximum number of prescriptions daily. For a great number of respondents (56.1%), the most common error in prescribing was not inquiring the patient about any allergies ($p=0.04$). When inquired about the awareness of World Health Organization guidelines to good prescribing, 50.5% respondents were unfamiliar of any such guidelines. The WHO six-step approach to prescribing along with continuous self-directed learning, devise an efficient and practical systematic approach to good prescribing. It was concluded that the students had moderate knowledge on drug prescription. Different educational programs and seminars should be carried out to inculcate the knowledge of these guidelines among the students.

Keywords: Drug Prescription, Dental Students, Pain-relievers, Antibiotics

INTRODUCTION

The dental students in the twin cities of Pakistan undergo four years of dental education, and they are introduced to pharmacology in the second year in which they learn about different medical and dental drugs, about their effects and interactions. In the third year, the students get involved in clinical practice, interacting and treating patients under supervision, eventually prescribing appropriate drugs well as countersigned by house officers or seniors.

The frequently encountered dental health condi-

tions are pain and infections for which the commonly prescribed drugs are antibiotics and pain relievers. Prescription is a piece of paper provided by a medical/dental practitioner that allows a patient to be issued with a medicine or dental treatment. It is a customized, dynamic clinical process, set according to the requirements of the patient and the knowledge of the practitioner.¹

According to World Health Organization, guidelines for good prescription writing is a process of rationale treatment which includes: defining the patients problem, specifying the therapeutic objectives, verifying the suitability of personal treatment, starting the treatment, giving information and instructions and finally monitoring the treatment.²

The faults in prescription writing are inaccurate prescribing, over or under prescribing and ineffective prescription which are usually a result of faulty medical judgement, treatment decision or treatment. Prescribing errors are those made in the act of writing or entering a prescription.³

The awareness about proper dosage and side effects as well as their interactions with other drugs is a pre-requisite for accurate prescription hence, this survey was undertaken to assess knowledge of the prescribing skills of third year, final year, and house

¹ Hina Ashraf, PG Trainee, Department of Dental Materials, Army Medical College National University of Medical Sciences, Rawalpindi, Pakistan.

² Mehwish Pasha, PG Trainee, Department of Dental Materials, Army Medical College, National University of Medical Sciences, Rawalpindi, Pakistan.

³ Maleeha Nayyer, **Corresponding Author:** Senior Lecturer, Department of Dental Materials, Army Medical College, National University of Medical Sciences, Rawalpindi, Pakistan. E-mail: mnayyer25@gmail.com, Cell: +92-334-5039350

⁴ Ayesha Aslam, Senior Lecturer, Department of Prosthodontics, Army Medical College/Armed Forces Institute of Dentistry, National University of Medical Sciences, Rawalpindi, Pakistan.

⁵ Muhammad Kaleem, Asst Professor & Head, Department of Dental Materials, Army Medical College, National University of Medical Sciences, Rawalpindi, Pakistan.

Received for Publication: Sep 10, 2018
First Revised: Dev 26, 2018
Second Revision: Dec 28, 2018
Approved: Dec 30, 2018

officers of bachelor of dental surgery (BDS) as the students step into their clinical life from third year onwards.⁴

MATERIALS AND METHODS

The present cross-sectional study was undertaken to assess the knowledge related to drug prescription among dental students. A questionnaire was designed with 16 close ended questions having equal number of options pertaining to the indication, dosage and duration of over-the-counter pain relievers and antibiotics. In a few questions, one option was kept intentionally wrong to gauge the knowledge of students. Additionally, the questionnaire included questions related to age, gender and category of dental student. Three categories of respondents were included; third year, fourth year and house officers and the questionnaires were distributed among the respondents of Armed forces institute of Dentistry (AFID), Army medical college (AMC) and Margalla institute of health sciences (MIHS) in Rawalpindi.

The research was approved by the Department of Pharmacology, AMC. Informed consent was obtained from the participants prior to the distribution of questionnaires. The data was analyzed using SPSS version 21 and presented using descriptive analysis. Only single, unequivocal replies were included in calculated frequencies and percentages.

RESULTS

Out of the 195 students surveyed, 30 (15%) were male and 165 (85%) were female and the mean age was 22 years. Division of respondents and their estimated number of prescriptions given on a daily basis (N) is given in Table 1. The house officers indubitably wrote the maximum number of prescriptions daily. Respondent percentages to frequently encountered health conditions were categorized chronologically as Pain (68%), followed by bleeding gums (11%), Infection (20%) and lastly trauma (1%); where a significant association was found between this variable and categories of stu-

dents ($p=0.03$). Table 2 and 3 indicate the respondent percentages to some of the important survey questions.

DISCUSSION

In dental practice the most common health condition treated is pain, however the study conducted by Guzmán-Álvarez et al. has stated infection to be the most frequent reason for prescription which is in accordance with the fact that patients visit dental clinics due to pain caused by infection. It is essential to know the origin and type of pain so that proper diagnosis and management can be done.⁵

The pharmacological aspects of non-steroidal anti-inflammatory drugs (NSAIDs) and a grip over their knowledge is a pre-requisite for judicious prescription. In the survey conducted, most of the students (51.5%) prescribed Ibuprofen which is in agreement with the previous studies in which the most commonly prescribed drug was ibuprofen.⁶ Ibuprofen is an over-the-counter (OTC) medication with analgesic, fever reducing and anti-inflammatory effects which works by reducing hormones that induce pain and inflammation in the body.⁷

Even though the students had good knowledge about prescribing ibuprofen as a pain reliever, out of 195 students, 59 (30.3%) selected acetaminophen (20 of third year, 25 of final year and 14 house officers). They were unaware that acetaminophen is a para aminophenol derivative with analgesic and anti-pyretic activity, but very little anti-inflammatory activity. Only 5.1% selected Mefenamic acid which is not a common choice in the practice of clinical dentistry. When inquired about the next best treatment option regarding the failure of pain relief with NSAIDs, 46.7% of the students reported that the best alternative would be the combination of acetaminophen and corticosteroids, only 9.2% selected corticosteroids alone.

As for antibiotics, 43.9% of the students chose Augmentin (amoxicillin and clavulanic acid) and 26.5% considered amoxicillin as the most commonly prescribed antibiotic. This is in accordance with the fact that pen-

TABLE 1: DIVISION OF RESPONDENTS AND NUMBER OF PRESCRIPTIONS

Number of prescriptions daily (N)	Category				p value (Fisher's Exact Test)
	3rd Year	Final Year	House Officer	Overall	
Less than 5	47	80	7	134	
10-20 prescriptions	1	11	44	56	
21-30	0	0	3	3	<0.01*
More than 30	0	0	2	2	
Total Respondents	48	91	56	195	

TABLE 2: QUESTIONS RELATED TO USE OF PAIN RELIEVERS AND RESPONDENT PERCENTAGES

Most Common NSAID prescribed	Overall Percentage of selected option (%)	Percentage division of selected option (%)			p value (Fisher's Exact Test)
		3rd Year	Final Year	House Officer	
a. Ibuprofen	51.8	15.8	52.5	31.7	0.06
b. Acetaminophen	30.3	33.9	42.4	23.7	
c. Naproxen	12.8	28.0	44.0	28.0	
d. Mefenamic Acid	5.1	50.0	20.0	30.0	
Treatment option if NSAIDS fail to relieve pain					
a. Opioids	24.1	23.4	59.6	17.0	0.09
b. Corticosteroids	9.2	22.2	27.8	50.0	
c. Acetaminophen	20.0	17.9	43.6	38.5	
d. Acetaminophen in combination with NSAID	46.7	28.6	45.1	26.4	
Safest pain-reliever option during pregnancy					
a. Acetaminophen	79.0	24.0	45.5	30.5	0.09
b. Naproxen	13.8	18.5	63.0	18.5	
c. Diclofenac	3.1	66.7	33.3	0.0	
d. Flurbiprofen	4.1	25.0	25.0	50.0	
Chemotherapeutic option to treat oral thrush					
a. Alvogyl	10.3	25.0	60.0	15.0	0.03*
b. Benzocaine gel	47.2	30.4	45.7	23.9	
c. Miconazole	21.5	14.3	35.7	50.0	
d. Fluconazole	21.0	22.0	53.7	24.4	

* indicates statistical significance

icillin is the first line of drug in treating odontogenic infections as it is a broad spectrum antibiotic and covers both aerobes and anaerobes.⁸ When inquired about alternative to penicillin in case of allergy, 21 students opted co-amoxiclav, which shows that they were unaware of the fact that it is also a penicillin ($p=0.02$).

The ability of bacteria to develop resistance to an antibiotic is called antibiotic resistance. This occurs when bacteria alter themselves in a way that decreases the effectiveness of drugs, chemicals, or other agents intended for the prevention or cure of infections. The bacteria survive and continue to multiply, causing immense harm.⁹ In this study, we also assessed the dosage and duration of antibiotic course. For the management of periodontitis, 59.7% respondents selected doxycycline 100 mg b.d. and only 22.1% respondents selected the o.d option.

Periodontal abscess is the third most frequent dental emergency and it is caused dominantly by gram negative anaerobic rods. While responding to the most suitable option for the management of periodontal abscess,

5.1% respondents chose Amphotericin-B. They lacked the knowledge that it is an anti-fungal medication and has no effect on bacteria and viruses.¹⁰

Oral thrush also known as oral candidiasis or denture stomatitis is caused by the colonization of a fungus, *Candida albicans*. It is considered normal flora but sometimes under certain conditions it can over grow and cause symptoms, specifically in immunocompromised individuals.¹¹ Ninety-two respondents selected benzocaine gel for the treatment of oral thrush, 20 opted alvogyl and 81 selected miconazole and fluconazole gels. A significant correlation was found between categories of respondents and this variable ($p=0.03$). Benzocaine gel is a local anesthetic commonly used as a topical pain reliever whereas alvogyl is a post extraction dressing for the treatment of dry socket.¹²

Dental pain during pregnancy can be caused by acute conditions such as injury, infection, hormonal changes and secondary to underlying medical disorders.¹³ When inquired about the safest pain reliever for pregnant females in their third trimester, 78.6% of

TABLE 3: QUESTIONS PERTAINING TO USE OF ANTIBIOTICS WITH RESPONDENT PERCENTAGES

Most common antibiotic prescribed	Overall percentage of selected option (%)	Percentage division of selected option (%)			p value (Fisher's Exact Test)
		3rd Year	Final Year	House Officer	
Amoxicillin	26.7	25.0	51.9	23.1	0.01*
Amoxillicin and clavulanic acid	44.1	25.6	34.9	39.5	
Metronidazole	28.7	21.4	60.7	17.9	
Cefadroxil	0.5	100.0	0.0	0.0	
Recommended dose of amoxicillin					
a. 500 mg 6 hourly	18.5	25.0	38.9	36.1	0.01*
b. 500 mg 8 hourly	36.4	38.0	39.4	22.5	
c. 625 mg 12 hourly	28.2	14.5	60.0	25.5	
d. 625 mg 6 hourly	16.9	12.1	48.5	39.4	
Alternative to penicillin in case of allergy					
a. Clindamycin	52.8	14.6	54.4	31.1	0.02*
b. Doxycycline	17.9	37.1	25.7	37.1	
c. Metronidazole	18.5	44.4	38.9	16.7	
d. Co-amoxiclav	10.8	19.0	57.1	23.8	
Most commonly prescribed antibiotic option for the management of periodontal abscess					
a. Penicillin	27.2	30.2	34.0	35.8	0.05*
b. Metronidazole	63.6	21.0	51.6	27.4	
c. Macrolides	4.1	37.5	25.0	37.5	
d. Amphotericin-B	5.1	30.0	70.0	0.0	
Time period of prescription for the recommended antibiotic for periodontitis					
a. 3 Days	38.5	26.7	48	25.3	0.30
b. 5-10 Days	57.4	22.3	45.5	32.1	
c. 1 Month	3.6	42.9	57.1	0.0	
d. 3 Months	0.5	0.0	0.0	100	

* indicates statistical significance

the respondents were well aware that the safest option is acetaminophen.

For a great number of respondents (56.1%), the most common error in prescribing was not inquiring the patient about any allergies ($p=0.04$). A considerable number of injuries are caused by adverse drug reactions and the side effects caused by drugs prescribed in the presence of known allergies can be a significant cause of patient harm.

For most students, source of prescription writing amounted to teachers (56.3%) and for a few students pharmacology course book was cited to be the main source (30.3%). A highly significant correlation was found between this variable and categories of respondents ($p<0.01$). To overcome the poor quality and in-

accurate prescription writing, a systematic approach consisting of important guidelines has been documented by the World Health Organization. When inquired about these, 50.5% respondents were oblivious/unfamiliar of any such guidelines.^{14,15}

CONCLUSION

This study shows that the knowledge of drug prescription among dental students of the mentioned colleges is moderate. Drug prescribing is an art and medical and dental students should have a good grasp on this. They should efficiently and systematically make prescriptions stating the patient's problem and therapeutic objective, and then choose the appropriate drug therapy. The students should also be aware of how to give information, instructions, and warnings

on the possible adverse effects of drugs with a proper follow-up of the treatment. Different educational programs and seminars should be carried out to inculcate the knowledge of these drug prescription guidelines among the students.

REFERENCES

- 1 Weinstock RJ, Johnson MP. Review of top 10 prescribed drugs and their interaction with dental treatment. *Dental Clinics*. 2016;60(2):421-34.
- 2 De Vries T, Henning R, Hogerzeil HV, Fresle D, Policy M, Organization WH. *Guide to good prescribing: a practical manual*. 1994.
- 3 Moura CSd, Naves Jos, Coelho EB, Lia EN. Assessment of quality of prescription by dental students. *Journal of Applied Oral Science*. 2014;22(3):204-8.
- 4 Jain A, Gupta D, Singh D, Garg Y, Saxena A, Chaudhary H, et al. Knowledge regarding prescription of drugs among dental students: A descriptive study. *Journal of basic and clinical pharmacy*. 2015;7(1):12.
- 5 Hersh E, T Kane W, G O'Neil M, Kenna G, P Katz N, Golubic S, et al. Prescribing recommendations for the treatment of acute pain in dentistry 2011. 22, 4-30; quiz 1 p.
- 6 Guzmán-Álvarez R, Medeiros M, Lagunes LR, Campos-Sepúlveda A. Knowledge of drug prescription in dentistry students. *Drug, healthcare and patient safety*. 2012;4:55.
- 7 Pozzi A, Gallelli L. Pain management for dentists: the role of ibuprofen. *Annali di stomatologia*. 2011;2(3-4 Suppl):3.
- 8 Ogle OE. Odontogenic Infections. *Dental Clinics*. 61(2):235-52.
- 9 Ventola CL. The antibiotic resistance crisis: part 1: causes and threats. *Pharmacy and Therapeutics*. 2015;40(4):277.
- 10 Herrera D, Roldán S, Sanz M. The periodontal abscess: a review. *Journal of clinical periodontology*. 2000;27(6):377-86.
- 11 Patil S, Rao RS, Majumdar B, Anil S. Clinical appearance of oral Candida infection and therapeutic strategies. *Frontiers in microbiology*. 2015;6:1391.
- 12 Syrjänen SM, Syrjänen KJ. Influence of Alvogyl on the healing of extraction wound in man. *International journal of oral surgery*. 1979;8(1):22-30.
- 13 Kennedy D. Analgesics and pain relief in pregnancy and breastfeeding. *Australian prescriber*. 2011;34(1).
- 14 Pollock M. Appropriate prescribing of medications: an eight-step approach. 2007;5: 1211
- 15 Organization WH. WHO model list of essential medicines: 17th list, March 2011.

CONTRIBUTIONS BY AUTHORS

- | | |
|---------------------------|---|
| 1 Hina Ashraf: | Author of article and Data Collection. |
| 2 Mehwish Pasha: | Co-author of article and Data Collection. |
| 3 Maleeha Nayyer: | Study conception and design. |
| 4 Ayesha Aslam: | Analysis and interpretation of data. |
| 5 Muhammad Kaleem: | Critical revision. |