

EVALUATION OF PRESCRIPTION DESIGN IN DENTAL UNIVERSITY HOSPITALS IN KARACHI, PAKISTAN

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ABSTRACT:

Aim: The aim of this research was to evaluate the prescribing pattern of dentists in dental teaching hospitals in Karachi, Pakistan.

Materials and method: 200 prescriptions written by dental students in their house job were analyzed and the presence or absence of all aspects of a well written prescription, the presence of certain errors in prescription and the number of antimicrobials, analgesics, mouthwashes and toothpastes prescribed were recorded for each patient prescription using a checklist based form. Results were computed and analyzed using SPSS version 17.

Results: Only 8 parameters out of 17 were stated in more than half of the prescriptions, the most common being the brand names of drugs prescribed and the least common being the drugs' generic names. The most common drug prescribed were the analgesics, antimicrobials being the second common. The most common error on the prescription was the absence of route of administration (188/200). 69% had no signature of the prescriber and 17% of the prescriptions were illegible.

Conclusion: The prescription writing skills of dental students and house officers in dental teaching hospitals in Karachi are far from perfect. More education needs to be given and implemented to the prescribers and they should strictly adhere to the guidelines. Awareness regarding the overall common errors needs to be shared and amended. There is a need to spread awareness about common prescription errors and their complications.

Keywords: prescription errors, dentists, university hospital



INTRODUCTION:

Prescription writing in dentistry plays a key role in the medical management of a patient. A clear, legible prescription on par with WHO standards is effective for avoiding many unnecessary complications due to misunderstanding and saves time, confusion and medico-legal problems. Increased health care expenses and decreased patient confidence in the health care system are the final outcomes of medication errors [1]. Complete information regarding the patient, the prescriber's details, proper

naming of the drug, its dosage and frequency are crucial in writing a proper prescription.

Local anesthetics, antibiotics and NSAIDs are the most commonly prescribed drugs in dentistry [2]. Since bacterial species, especially *Staphylococcus aureus*, are getting more resistant to antibiotics [3], care should be taken to ensure correct dosage and frequency and avoid overprescribing of these and other drugs. While writing a prescription, drug-drug interactions and contraindications

of the drugs being prescribed should also be borne in mind.

In 1962, Barker and McConnell in the USA estimated a rate of 16 medication errors per 100 doses, which was much higher than suspected [4]. The results of many studies have suggested that a majority of house officers miss out key information while writing a prescription, such as date and instructions for labelling [5]. The aim of this study, therefore, was to find out the lacking components of prescriptions being written in dental teaching hospitals so that attention can be given to those aspects and awareness can be made common about improving the lacking parts. Of the five years of the dental training programmes offered in Karachi, pharmacology is a compulsory subject for second-year undergraduate dental students and prescription writing is part of their curriculum. It is important to evaluate whether the prescription writing skills being learnt by students are being applied practically as well.

MATERIALS AND METHODS:

This was an anonymous, cross-sectional checklist based survey to analyse the prescribing patterns of dental personnel in dental teaching hospitals in Karachi. In accordance with the WHO guidelines for prescription writing, a checklist was formulated to assess the quality of the prescriptions included in the study. Every point in the checklist had to be marked Yes or No, indicating its presence or absence in the prescription respectively.

All aspects of patient information, the prescriber's details, drug information and dosage were considered in this way. The number of analgesics, antimicrobials, mouthwashes and toothpastes prescribed was also to be mentioned in the checklist and a list of significant prescription errors was given, from which the authors checked the errors in the prescription being assessed. Potential interactions between drugs were checked by the Drug Interaction Checker tool available on the Medscape site [6].

Checklist for the Assessment of Prescription Design among Dental Professionals in a Dental University Hospital (In a prescription sample, check whether the following are mentioned or not)

Patient & Prescriber's Details:

1. Patient's Name
2. Patient's Gender
3. Patient's Age
4. Prescriber's Name
5. Prescriber's Qualification
6. Hospital Address
7. Prescriber or Hospital's Phone Number
8. Prescriber's Signature
9. PMDC Registration Number

Details of the Drug(s) Prescribed:

10. Brand Name
11. Generic Name
12. Drug Strength
13. Dose:
Clearly mentioned
Correctly mentioned
14. Route of Drug Administration
15. Duration of Drug Use

16. Directions for Patients

17. Follow-up Recommendation

Number of Drugs Prescribed

Antimicrobials _____

Mouthwashes _____

Analgesics _____

Others _____

Prescription Errors:

1. Incorrect drug
2. Drugs with the same indication prescribed
3. Repeated Drug
4. Drugs which could possibly cause drug-drug interactions prescribed together
5. Less accepted name for a drug or abbreviated drug names
6. Excess use of abbreviations or symbols
7. Route of administration not mentioned for a drug
8. Incorrect dosage
9. Dose not mentioned for a prescribed drug
10. Higher dose of a drug than suggested by literature
11. Incorrect frequency of a drug prescribed
12. Prescriber's initials absent
13. Illegible handwriting

With a decided sample size of 200, the authors randomly analyzed prescriptions written by students who were at least in their third year of BDS and had completed their basic pharmacology course, and house officers in three dental teaching hospitals registered with the Pakistan Medical and Dental Council (PMDC) in Karachi, with informed consent from the prescribers. For every prescription, the checklist was filled accordingly. Data was analysed using

SPSS version 16. The results were expressed statistically and in the form of percentages.

RESULTS:

The results were calculated for a total of 200 prescriptions analysed in the study. All prescriptions analysed were written by third- or fourth-year BDS students, or house officers. Parameters that were most commonly included in the prescriptions analysed include brand names of the drugs prescribed (97%), correct dosage (94%) and duration of drug use (88%), followed by patient name (85.5%), drug strength (77.5%), hospital address (77%) and phone number (77%) and the patient's age (73.5%).

Less mentioned parameters which were absent in most prescriptions include generic names of drugs (1.5%), the prescriber's registration number (2%) and qualification (5.5%), advice for follow-up (5.5%), route of drug administration (6%), the prescriber's name (7.5%), the patient's sex (21.5%), the prescriber's signature (31%) and instructions for patients (43%). A detailed list of all information that should ideally be mentioned in a prescription is given in tables 1 and 2, along with the percentage of prescriptions that did and did not include each parameter.

Table 3 enlists in detail some significant errors with the percentage of prescriptions having each error. The route of drug administration and the

prescriber's signature were missing in most. 1% prescriptions contained drugs which could possibly interact together. Prescriptions were also checked for legibility, repetition, abbreviated drug names, and whether the drug, dosage and frequency were prescribed correctly.

Figure 1 shows the percentage frequency of the different items prescribed. A total of 425 items (analgesics, antimicrobials, mouthwashes and toothpaste) were prescribed in the 200 prescriptions assessed, out of which analgesics were the most common (168), closely followed by antimicrobials (143), mouthwashes (62) and toothpaste (28).

DISCUSSION:

This study shows the prescribing quality of dental students and house officers. In more than half of the prescriptions assessed, only 8 out of 17 parameters were mentioned, which may be due to lack of knowledge or simply may be the result of neglect. A study conducted by Moura et al to assess the prescription writing quality of dental students showed that failure of patient and prescriber identification were common [7], as supported by our study.

Brand names of drugs were commonly used versus the generic name, which was included in only 1.5% of the prescriptions, which is of significance since the brand name narrows down the choice of the patient where other cheaper analogous drugs might be available in the market instead.

Dentists should strictly adhere to guidelines for antibiotics prescription in order to avoid complications arising from an injudicious use of antimicrobials. This research shows that antimicrobials were prescribed in 143 out of a total of 200 prescriptions. It has already been concluded in a 2010 Jordanian study that dentists have inadequate prescribing practices and this is manifested by over-prescribing [8]. This suggests that many prescriptions included in our study may have had unnecessarily prescribed antimicrobials.

In dental practice, antimicrobials are prescribed for treating odontogenic (especially endodontic) infections, and as prophylaxis for spread of infection locally and systemically [9]. A previous study states that decreased awareness, lack of outcome expectancy, lack of agreement, previous practice inertia and external obstacles related to patients and healthcare system characteristics are the reasons that the present clinical guidelines for antibiotic prescription are not being followed [10]. Of all antibiotics, previous studies claim the amoxicillin/clavulanate association to be the most commonly prescribed in dentistry [9,11,12].

A limitation of this study is that the presence of some other important parameters was not assessed like date, diagnosis, the Rx symbol and refill information, all of which should be part of a prescription as well. The diagnoses were just considered to assess whether the drugs were prescribed correctly, but

whether they were mentioned on the prescriptions was not part of the study. Prescription errors were assessed in the samples and were marked in the checklist if present, but the specific error was not recorded for each case, leading to generalized results.

In order to make the prescription writing skills of dentistry students better, interventions like group seminars should be held, which have proven to be quite effective when done as part of a survey in Nigeria [13]. Nowadays, problem based

learning (PBL) has been internationally recognised as a teaching method in various medical schools [14], and could be helpful in training students to prescribe appropriate medications for each case.

CONCLUSION:

Dental students and house officers in dental teaching hospitals in Karachi lack the skills required for writing a standard prescription. More training, strict protocol and proper guidelines for prescription writing should therefore be given at an undergraduate level.

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TABLES AND FIGURES:

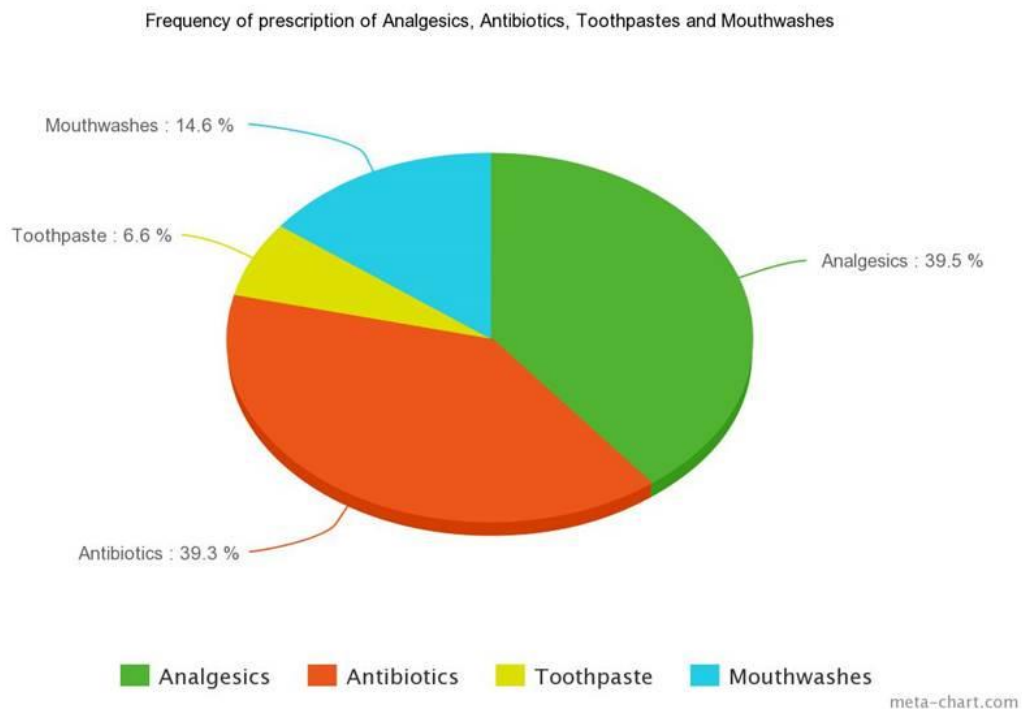


Figure 1: frequency of prescription of analgesics, antibiotics, toothpastes and mouthwashes

Table 1: A representation of patient and prescriber/doctor data on the 200 prescriptions analyzed

S. No.	Parameter	YES (%)	NO (%)
	Patient Information:		
1.	Patient's name	85.5	14.5
2.	Patient's gender	21.5	78.5
3.	Patient's age	73.5	26.5
	Prescriber/Doctor Details:		
4.	Prescriber's name	7.5	92.5
5.	Prescriber's qualification	5.5	94.5
6.	Hospital address	77	23
7.	Prescriber's or hospital's phone number	77	23
8.	Prescriber's signature	31	69
9.	PMDC registration number	2	98

Table 2: A representation of drug information on the 200 prescriptions analyzed

S. No.	Parameter	YES (%)	NO (%)
1	Brand name	97	3
2	Generic name	1.5	98.5
3	Drug strength	77.5	22.5
4	Dose:		
5	Clearly mentioned	91.5	8.5
6	Correctly mentioned	94.0	6.0
7	Route of drug administration	6.0	94.0
8	Duration of drug use	88	12
9	Directions for patients	43	57
10	Follow-up recommendation	5.5	94.5

Table 3: Percentage frequencies of various prescription errors observed in the 200 prescriptions analyzed

S. No.	Category of Prescription Error	Frequency (%)
1.	Incorrect drug	3
2.	Drugs with the same indication prescribed	3
3.	Repeated drug	2
4.	Drugs which could possibly cause drug-drug interactions when prescribed together	1
5.	Less accepted name for a drug or abbreviated drug names	9
6.	Route of administration not mentioned for a drug	94
7.	Incorrect dosage	6
8.	Dose not mentioned for a prescribed drug	8
9.	Higher dose of a drug than suggested by literature	4
10.	Incorrect frequency of a drug prescribed	12
11.	Prescriber's initials missing	69
12.	Illegible handwriting	17