The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-0-1387

DOI: 10.29309/TPMJ/2019.26.05.1387

EVALUATION OF DRUG-DRUG INTERACTIONS AMONG DENTAL PRESCRIPTIONS AT DIFFERENT CLINICAL SETTINGS OF SIALKOT, PUNJAB, PAKISTAN.

Danish Javed[1], Sana Zafar[2], Shakeel Ahmed[3], Khurram Anwar[4], Mudassar Iqbal Arain[5], Saira Shahnaz[6]

1. BDS, MSc Oral Pathology
Assistant Professor
Department of Oral Pathology
Islam Dental College Sialkot.
2. BDS, MSc Oral Biology
Associate Professor and HOD
Department of Oral Biology,
Islam Dental College, Sialkot.
3. MD, FCPS
Assistant Professor
Department of Oral and Maxillofacial Surgery
Islam Dental College Sialkot.
4. BDS, MSc
Assistant Professor
Department of Operative Dentistry
Isra Medical and Dental College,
5. Pharm.D, PhD.
Assistant Professor
Faculty of Pharmacy,
University of Sindh, Jamshoro.
6. M.Phil.
Lecturer
Faculty of Pharmacy
Ziauddin University Karachi.

Correspondence Address:
Dr. Danish Javed
Department of Oral Pathology
Islam Dental College Sialkot.
sciencepk62@gmail.com

Article received on:
22/11/2018
Accepted for publication:
09/02/2019
Received after proof reading:
22/05/2019

ABSTRACT: Drug plays a fundamental role in disease prevention and ultimately promotes healthy society. Inappropriate prescribing traditions are not only goes toward useless & unsafe treatment but also prolongation of illness and distress the patient and increased economic burden. This study can also be helped as a pharmaco-epidemiological extent for carrying out of a national preventive drug policy. To assess Drug-Drug interactions among dental prescriptions at different clinical settings of Sialkot, Punjab, Pakistan. **Study Design:** A descriptive observational study. **Settings:** A hospital based study was conducted in different clinical settings of Sialkot, Punjab, Pakistan. **Period:** Six months from January to June 2018 according to study criteria. **Materials and Methods:** The Sample size is 500 prescriptions were collected randomly in six months from January to June 2018 according to study criteria. A structured data form was used for collecting demographics, diagnosis, complications, present medications prescribed for each patient and find out number of prescriptions which shows drug-drug interactions and level of severity as well. MS Excel and descriptive statistics was used for find out the result of the study. **Results:** The current study finding shows that males have more prevalence i.e. 55.8% of dental problems compared to females (44.2%). Mostly patients were included in 51-60 age group (30.2%). 50.2% patients have pervious medication history and most common diagnosis was acute periapical infection (26.8%). Further mostly analgesics (26%) were prescribed followed by antibiotics (21.5%) with elevated body temperature (29.4%). Commonly six drugs per prescription prescribed (34.2%) least numbers of drugs prescribed per prescription is 2(8.2%). 30.6% prescriptions reported with drug-drug interaction in which 26.8% were prescribed in acute periapical infections. More frequently was observed between Glimepiride – Levofloxacin (25.5%) followed by levofloxacin-prednisolone (24.8%). **Conclusion:** It was concluded that the frequency of drug-drug interactions in prescriptions by dentist in private dental clinics of Sialkot is high but majority of drug interactions with other drugs were found to be of significant minor occurring at pharmacodynamics level.

Key words: Dental, Drug, Interaction, Pakistan, Prescriptions, Sialkot.

Article Citation: Javed D, Zafar S, Ahmed S, Anwar K, Arain MI, Shahnaz S. Evaluation of drug-drug interactions among dental prescriptions at different clinical settings of Sialkot, Punjab, Pakistan. Professional Med J 2019; 26(6):859-864.**DOI:** 10.29309/TPMJ/2019.26.05.1387

INTRODUCTION

Drug plays a fundamental role in disease prevention and ultimately promotes healthy society. Inappropriate prescribing traditions are not only goes toward useless and unsafe treatment but also prolongation of illness and distress the patient and increased economic burden. Thus, irrational use of medicines distresses the quality and safety of beneficial care. Unreasonable multiple drugs prescriptions known as polypharmacy may be due to management based on sign and symptoms rather than the proper diagnosis. Such type of polypharmacy may lead to decline in quality of drug utilization, waste of resources, rise of bacterial resistance, increased economic burden, increased adverse drug reactions, and drug drugs interactions.[1] Therefore, evaluation of drug-drug interactions are considered a necessary starting in forming an effective drug utilization stewardship program, with the leading objectives of upgrade the efficacy of treatment & reducing the microbial resistance; this study can also be helped as a pharmaco-epidemiological extent for

carrying out of a national preventive drug policy.[2] Systematic drug use have discovered current measures by incorporating the consequences of studies signifying active preventive programs and decreased miss use of drug.[3] The rational practice of prescribing is imperious in dental care, hence, a survey was conducted to evaluate the drugs prescription trends in primary dental care in Sialkot, to determine prescribing patterns, to recognise ultimate misuses or overuse of medicines and to assist the standards for the rational use of drugs. The aim of this study was to analyse clinical prescriptions record of dental patients attending private clinics of Sialkot. This was to evaluate the prescribing trends of different drugs and investigate drug-drug interactions which are prescribed in a prescription.

It is no surprise that the possibility for drug-drug and adverse drug interactions are a growing fear for all stages of patient health care system as well as in dental medicine, the additional complications are common food products such as grapefruit juice, which are used by many patients because of it has benefits for cardiovascular and cancer-preventing, it has been complicated in some of serious drug interactions.[4] polypharmacy in prescriptions is common and is well known reason in dental facilitate to increase number of drug-drug interactions (DDIs), multiple number of drugs prescribing usually surges the possibility of interaction between the drugs. The causes which greatly contribute in adverse interactions include: diet, polypharmacy, patient`s age and those having heart problems & other co-morbid.[6,7]

While most commonly prescribed drugs (analgesics, aesthesia / vasoconstrictors& antibiotics) by the dentist, its show many of the possible interactions which can take place with other drugs. A main point to be here is that most of these drug interactions have been arose when the patients have been using drugs for prolonged periods of time and misuse it. In specifically, the consequences of combining supra therapeutic doses of local aesthetics along with narcotic sedative has been disturbed the patients. Hence dentists should be aware and alert to these adverse interactions and recognise the reasons on which they mostly occur, in order to evaluate the risk posed by wrong drug prescribing to patients who are already used medication for other diseases.[5] The aim of this study was to analyze clinical prescriptions record of dental patients attending private clinics of Sialkot. This was to evaluate the prescribing trends of different drugs and investigate adverse drug interactions of drug which are prescribed in a prescription.

METHODOLOGY

Study Design

A hospital based descriptive observational study.

Study Site

The study was conducted in the different clinical settings of Sialkot, Punjab, Pakistan.

Study Sample

Sample size is 500 prescriptions were collected randomly in six months (Jan-Jun 2018) according to study criteria.

Collection of Data

500 prescription were collected and a data form was used for collecting data. This form contains various portions such as demographics, diagnosis, complications, present medications prescribed for each patient and find out number of prescriptions which show drug-drug interactions. The information were recorded in the prepared data form.

Data Analysis

MS Excel and descriptive statistics was used for find out the result of the study.

RESULTS

Gender Wise Distribution

Table-I demonstrates that males have more prevalence 55.8% to dental problems as compared to females (44.2%).

Gender	No. of Patients	Percentage
Male	279	55.8%
Female	221	44.2%
Total	500	100%

Table-I. Gender wise distribution

Age Wise Distribution

Mostly patients were included in 51-60 age group (30.2%).

Age Groups	No. of Patients	Percentage
Less than 10 years	31	6.2%
11-20	55	11%
21-30	43	8.6%
31-40	57	11.4%
41-50	62	12.4%
51-60	151	30.2%
>61	101	20.2%
Total	500	100%

Table-II. Age wise distribution

Pervious Medical History of Patients

Majority of the prescriptions have not any Information about medical history (40%).

Medical History	No. of Patients	Percentage
Yes	251	50.2%
No	49	9.8%
Not mentioned	200	40%
Total	500	100%

Table-III. Pervious medical history of patients

Frequency of Co-morbidity with Dental Problems

Most frequent co-morbid disease is hypertension (11.2%) followed by diabetes (10.2%).

Diseases	No. of Patients (500)	Percentage (100%)
Diabetes	51	10.2%
Hypertension	56	11.2%
Congestive Heart Failure	23	115%
Myocardial Infarction	18	3.6%

Table-IV. Frequency of co-morbidity wit dental problems

Most Frequently Diagnosed Dental Problems

Mostly patients reported with acute periapical infection (17.4%) followed by Pulpitis (15.6%).

Clinical Diagnosis	No. of Patients	Percentage
Acute periapical infection	87	17.4%
Pulpitis	78	15.6%
Chronic periodontitis	79	15.8%
Periapical or periodontal abscess	76	15.2%
Acute inflammation	61	12.2%
Dry socket	23	4.6%
Implant placement	35	7%
Inflammation of the sublingual gland	34	6.8%
Fracture of teeth	27	5.4%
Total	500	100%

Table-V. Diagnoses frequency

Frequency of Various Clinical Symptoms

Mostly Elevated temperature and systemic spread (29.4%) was reported in patients.

Clinical Symptoms	No. of Patients	Percentage
Elevated temperature and systemic spread	147	29.4%
Localized fluctuant swelling	120	24%
Gross/diffuse swelling	98	19.6%
Restricted mouth opening	70	24%
Difficulty in swallowing	65	13%
Total	500	100%

Table-VI. Reported various clinical symptoms

Number of Drugs Prescribed in Per Prescription

Drug-drug was mostly reported in Patients to whom four to six medicines (34.2%) were prescribed.

No. of Drugs	No. of Prescriptions	Percentage
2	41	8.2%
3	44	8.8%
4	73	14.6%
5	87	17.4%
6	171	34.2%
>6	84	16.8%
Total	500	100%

Table-VII. Number of drugs prescribed in per prescription

Prescribing frequency of different drug categories

The drugs which dentists use in daily practice can be divided into few groups: analgesics, local anesthetics, antimicrobials (Antibiotics, Antifungals, Antivirals), antifungals and antiseptics. Most frequently analgesics (26%) were prescribed.

Name of Category	No of Drug	Percentage
Antibiotics	551	21.5%
Analgesics	667	26%
Anesthetics	472	18.4%
Antifungals	331	12.9%
Antiseptics	263	10.3%
Miscellaneous Drugs	278	10.9%
Total	2562	100%

Table-VIII. Prescribing frequency of different drug categories

Frequency of Prescription with Drug-Drug Interaction

30.6% patients prescription were showed that their prescribing drugs can interact to each other.

Case	No. of Prescription	Percentage
Drug-drug interaction	153	30.6%
Appropriate	347	69.4%
Total	500	100%

Table-IX. Frequency of prescription with drug-drug interaction

Frequencies of Drug-Drug Interact in Different Diagnosis

Out of 153, 26.8% patients with acute periapical infection were reported.

Frequencies of Reported Drug-Drug Interactions

Out of 500 hundred, in 153 prescriptions drug - drug interactions were reported. This Table enlists widespread interaction, Glimepiride – Levofloxacin (25.5%) was the most prevalent interacting pair.

Clinical Diagnosis	No of Prescriptions	Percentage
Acute periapical infection	41	26.8%
Pulpitis	29	19%
Inflammation of the sublingual gland	24	15.7%
Periapical or periodontal abscess	21	13.7%
Fracture of teeth	12	7.9%
Chronic periodontitis	16	10.4%
Dry socket	7	4.6%
Implant placement	3	1.9%
Total	153	100%

Table-X. Frequencies of drug-drug interact in different diagnosis

Drugs Name	No. of Prescrip-tion	Perce-ntage	Potential Adverse Outcomes
Ibuprofen – Levofloxacin	14	9.2%	Seizures
Ciprofloxacin – Diclofenac	27	17.6%	Increased ciprofloxacin plasma concentrations
Aspirin – Atenolol	19	12.4%	Decreased antihypertensive effect
Diclofenac – Metronidazole	16	10.5%	Increased exposure of diclofenac
Glimepiride – Levofloxacin	39	25.5%	Hypoglycemia or hyperglycemia
Levofloxacin – Prednisolone	38	24.8%	Tendon rupture
Total	153	100%	

Table-XI. Frequencies of reported drug-drug interactions:

DISCUSSION

Right selection of drug is basic requirement for rational use of medicines in dentistry.[8] Drug interactions are major problem and a common factor of adverse effects, Outcomes from the adverse reactions for about 10 to 20 percentage of patients' admissions to the hospital moreover 1% hospital admissions result from drug-drug interactions.[9] An unpredicted change is significant interaction in patient occur as a result of inappropriate therapeutic drugs combination. Around about 3 to 5% of all adverse

reactions of drugs may outcomes from drug-drug interactions.[10] In this study, Prescriptions of 500 patients from different dental clinics were collected, in which 153 patients have to prescribe with those drugs which can interact to each other. Most commonly 6 drug were prescribed in 34.2% patients, which show polypharmacy trend in prescribing. Acute periapical infection are mostly reported in dental patients (26.6%) and common symptom was Elevated temperature and systemic spread (29.4%). The possibilities of adverse drug reactions increase in the existence of pervious medical history, comorbidities, and polypharmacy. Most frequently prescribed drug categories were analgesics (26%) and antibiotics (21.5%) because postoperative dental pain and infection are common problems in these patients. Analgesics and antibiotics mostly show drug-drug interactions in dentistry. Nonsteroidal anti-inflammatory drugs (NSAIDs) are mostly prescribed by dentist as analgesics for pain management. These NSAIDS can inhibit cyclooxygenase-1 (COX-1) & (COX-2) enzymes, which are implicated in the production of thromboxane's and prostaglandins (PG) thus, the drugs which are reliant on the activity and physiologic levels of these intermediaries may be overstated when NSAIDS are used with them.[11] Mostly drug interaction was observed in Glimepiride – Levofloxacin 25.5% followed by levofloxacin oral and prednisolone oral (25%) [Combination of this may be increase risk of tendon rupture. Among them, majority of the interactions were of moderate and minor.

CONCLUSION

The frequency of drug-drug interactions in prescriptions by dentist private dental clinics of Sialkot is high but majority of drug interactions with other drugs were found to be of significant minor occurring at pharmacodynamics level. NSAID group interaction with other drugs was more common. Implementation rational prescribing guidelines and knowledge can reduces the chances of drug-drug interactions in dental practice.

REFERENCES

1. Trostle J. **Inappropriate distribution of medicines by professionals in developing countries.** Soc Sci Med, 1996; 42: 1117–1120. 2.
2. Tawfik Y, Northrup R, Prysor-Jones S. **Utilizing the potential of formal and informal private practitioners in child survival: situation analysis and summary of promising interventions. Bureau for Africa, office of sustainable development.** (2002).
3. Mertens-Talcott SU, Zadezensky I, De Castro WV, Derendorf H, Butterweck V. **Grapefruit–drug interactions: Can interactions with drugs be avoided?** J Clin Pharmacol 2006: 46: 1390–1416.
4. Offerhaus O. **Rational use of drugs in Balkans: A WHO Workshop.** Essential Drugs Monitor. 1995: L20 (3):38-42.
5. Haas DA. **Adverse drug interactions in dental practice: Interactions associated with analgesics.** Part III in a series. J Am Dent Assosc. 1999; 130:397-407.
6. Kaliamurthy K, Kumar A, Punniyakotti S, Devanandan P. **Study of Drug-Drug interactions in general medicine department of a Tertiary Care Hospital.** J Appl Pharm Sci. 2015; 5(12):122-124. doi: 10.7324/JAPS.2015.501221.
7. Costa AJ. **Potential drug interactions in an ambulatory geriatric population.** Fam Pract. 1991; 8:234–236.
8. Offerhaus O. **Rational use of drugs in Balkans: A WHO Workshop.** Essential Drugs Monitor. 1995:L20 (3):38-42.
9. Jankel CA, Fitterman LK. **Epidemiology of drug-drug interactions as a cause of hospital admissions.** Drug Saf. 1993; 9(1):51-59.
10. **Adverse Drug Reactions and Drug-Drug Interactions: Consequences and Costs-By: AMFS Pharmacology Expert.** Available from: http://www.amfs.com/resources/ medical-legal-articles-by-our experts/350/adverse-drugreactions-and-drug-drug-interactions-consequences-andcosts. Accessed on March 2017.
11. Haas DA. **Adverse drug interactions in dental practice: Interactions associated with analgesics.** Part III in a series. J Am Dent Assosc. 1999; 130:397-407.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Danish Javed	Concept & Write up.	
2	Sana Zafar	Write up & Collection of data.	
3	Shakeel Ahmed	Analysis.	
4	Khurram Anwar	Analysis.	
5	Mudassar Iqbal Arain	Write up & Proof reading	
6	Saira Shahnaz	Proof reading	