

## Drug therapy in dental out patients

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### Abstract

**Introduction:** Pharmacotherapy and dental procedure are important factors to treat many dental diseases.

**Objectives:** To find out the prescription patterns in relation to type, dose, duration, dosage form, frequency, route, trade/generic name and indication of the drugs prescribed in dental out-patients.

**Materials and methods:** This study consisted of drug prescriptions of 200 dental patients attending different dental clinics in Kathmandu, Nepal. Data were collected by using pretested cutomised proforma by dental surgeons from June 2010 to September 2010. Data were compiled and Chi square test with Yates correction was applied whenever appropriate and level of significance was set at  $\leq 5\%$ .

**Results:** Two hundred patients received total number of 439 drug prescriptions. Out of 200 patients, 107 (53.5%) were males and 93 (46.5%) were females with age range 4-72 years old. Percentage of patients receiving three drugs, two drugs and one drug were 21%, 61% ( $P < 0.01$ ) and 16% respectively. 108 patients (54%,  $P < 0.01$ ) received antimicrobial agent (AMA) and along with other drug. Average no. of prescription per patient was 2.2. 354 drugs (86.6%,  $P < 0.01$ ) were prescribed by trade names and 354 (80.6%,  $P < 0.01$ ) drugs were prescribed in the form of tablets or capsules followed by syrup (5.7%). Out of 439 prescriptions, 258 (58.7%,  $P < 0.01$ ) were analgesic agents, 138 (31.5 %) antimicrobial agents (AMAs), 17 (3.9%) antiseptics and 10 (2.3%) desensitizing agents. 96.9% analgesic agents were from non-steroidal anti-inflammatory group. Extended spectrum penicillins were the most commonly prescribed (86.9%) followed by metronidazole (9.5%). Minimum to maximum number of days for pharmacotherapy were 1 to 21 and highest frequency was up to four times a day. Chronic irreversible pulpitis was the commonest diagnosis (28%) followed by chronic generalized gingivitis (27%).

**Conclusion:** Nonsteroidal analgesics (paracetamol, nimesulide and ibuprofen) were most commonly prescribed medicine followed by extended spectrum penicillin (amoxicillin) and then metronidazole. All the patients received pharmacotherapy. Medicines were mostly prescribed by trade names in solid dosage forms (tablet/capsule) via oral route. Highest frequency of drug administration was up to four times a day with duration 1-21 days. Chronic irreversible pulpitis was the most common diagnosis followed by chronic generalized gingivitis.

**Key words:** Dentistry, Drug, Pharmacotherapy, Prescription

### Introduction

Prevalence of dental diseases is quite high worldwide. Periodontal problems, dental caries and other soft tissue pathoses involving oral mucosa are quite prevalent among much population in both developed and developing countries. Adequate oral hygiene measures and use of fluoridated tooth pastes are not properly practiced though this is the mainstay in the prevention of many dental problems<sup>1</sup>. Most of the dental treatments are procedure oriented requiring both substantial amount of knowledge and skill. However,

only the dental procedure is not sufficient enough to treat many dental problems and it has to be accompanied by pharmacotherapy. Pharmacotherapeutic knowledge and skill of dental treatment are indispensable to increase the quality and success of dental treatment. Prescription of sugar-free medication, whenever possible, especially in paediatric patients is another concern to reduce the burden of dental caries and its complications<sup>2</sup>. On the contrary, injudicious use of drugs has led to ineffective and unsafe treatment, exacerbation or prolongation of

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illness, distress and harm to the patient as well as an additional burden of an expensive medical cost to the patients.<sup>3</sup> For example, non-selective and widespread use of antimicrobials leads to development of bacterial resistance and is a serious concern in the dental and medical field because whether we may land in a post- antibiotic era or a worldwide bacterial resistance to the most of the available antimicrobials in the very near future is a major concern in the world's medical arena. The epidemiological trend of antibiotic resistance observed so far, tends to indicate that we will continue to move in the opposite direction, towards an environment with ever-growing number of new infectious diseases and of more common bacteria developing antibiotic resistance, more bacteria becoming resistant from hospital setting to the community. The net result could be even higher morbidity, higher mortality, higher costs, and the potential for rapid spread of these bacteria and overall a decreasing number of useful antimicrobial agents (AMAs) to combat the infections they cause<sup>4</sup>. Objective of this study was to find out the prevalence of drug prescriptions in regard to type, dose, duration, dosage form, frequency, route and indication of the drugs prescribed in dental out-patients.

#### Materials and methods

This was a prospective study carried out from June 2010 to September 2010 in different dental clinics in Kathmandu. Dental surgeons were trained and given pre-tested customized proforma. Dental prescriptions of the dental patients attending dental clinics were analyzed for age, gender, no. of drugs for each patient, generic

or trade name, dosage form, dose, frequency, route, duration and indication. Data were analyzed by Chi square test with Yates correction whenever appropriate and level of significance was set at  $\leq 5\%$ .

#### Results

Two hundred dental patients and their drug prescriptions were included in this study. Out of 200 patients, 107 (53.5%) were males and 93 (46.5%) were females with age range 4-72 years old and total numbers of 439 drugs were prescribed. Percentage of patients receiving three drugs, two drugs and one drug was 21%, 61% ( $P < 0.01$ ) and 16% respectively. 108 patients (54%,  $P < 0.01$ ) received AMA and along with other drug (Table 1). Average no. of prescription per patient was 2.2. 354 drugs (86.6%,  $P < 0.01$ ) were prescribed by trade names and 354 (80.6%,  $P < 0.01$ ) drugs were prescribed in the form tablet or capsule followed by syrup (5.7%) (Table 2). Out of 439 prescriptions, 258 (58.7%,  $P < 0.01$ ) were analgesic agents, 138 (31.5 %) AMAs, 17 (3.9%) antiseptics and 10 (2.3%) desensitizing agents. 96.9% analgesic agents were from non-steroidal anti-inflammatory group (Table 3 & 4). Extended spectrum penicillins were the most commonly prescribed (86.9%) followed by metronidazole (9.5%) (Table 3 & 4). Minimum to maximum number of days for pharmacotherapy were 1 to 21 and highest frequency was up to four times a day. Different characteristics of pharmacotherapy such as names of drugs, dosage forms, doses, frequency and duration are presented in Table 3. Chronic irreversible pulpitis was the commonest diagnosis (28%) followed by chronic generalized gingivitis (27%) (Fig 1).

**Table 1:** Sex distribution and patterns of antimicrobial agent (AMA) prescription (total drug prescriptions = 439)

Title	Total no of patients n=200/ drugs	Percentage (%)
Male	107	53.5
Female	93	46.5
No of Pt who received drugs	200	100
Total no of AMAs prescribed	138*	31.5
Pt who received AMAs plus other drug	108*	54
Pt who received other drugs only	92	46
AMAs prescribed by generic name	30	21.7
AMAs prescribed by trade name	108*	78.3
AMAs used in the form of syrup	10	7.2
AMAs used in the form of tab/cap	128*	92.3
Pts who received one AMA	98*	49
Pts who received two AMAs	20	10
Pt who received three drugs	32	16
Pt who received two drugs	122*	61
Pt who received one drug	42	21

AMAs- antimicrobial agents, \*  $P < 0.01$ , mean prescription= 2.2/patient, age 4-72 yrs

**Table 2:** Percent wise distribution of trade, generic names and dosage forms of the drugs

Title	Total no of prescriptions N=439	Percentage (%)
Trade name	354*	80.6
Generic name	85	19.4
Tab/cap	391*	89.0
Syrup	25	5.7
Mouthwash/gargle	13	3.0
Gel/paste	10	2.3

\* P&lt;0.01

**Table 3:** Highest to lowest order of prescribed drugs with name, dose, dosage form, frequency and duration

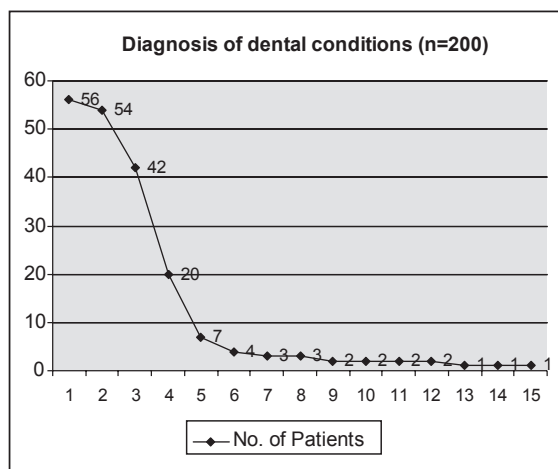
Name of the drug	No of drug prescription (%) n=439	Dose & dosage form	Frequency	Duration in days
Ibuprofen + paracetamol	126 (28.8)	½ tab- 1 tab/ /5ml-10ml syrup	sos, tid	3 -5
Amoxicillin	114 (25.9)	250mg-500mg/125ml/1tsp-2tsp cap/syrup	tid	5-7
Paracetamol	73 (16.7)	250 mg, 500mg tab, 5ml syrup	sos, tid	2 -5
Nimesulide	45 (10.3)	100mg	Sos,bid	2-5
Metronidazole	13 (2.9)	200mg-400mg tab	tid	5-7
Chlorhexidine	10 (2.3)	5ml -10ml mouthwash, gel	Bid, qid	7-14
Desensitizing agents	10 (2.3)	Mouthwash, paste	bid	14-21
Ibuprofen	9 (2)	200mg, 400mg tab	Sos, tid	3
Tramadol	5 (1.2)	50mg cap	tid	3-5
Betadine	5 (1.2)	10ml mouthwash	tid	10
Ampicillin 250mg + cloxacillin 250mg	4 (0.9)	1 tab	tid	5- 7
Doxycycline	4 (0.9)	100mg cap/tab	bid, od	9
Amoxicillin 250mg+clavulanic acid 125mg	3 (0.6)	1-2 tab	tds	5-7
Paracetamol 500mg+diclofenac 50 mg+ chlorzoxazone 500mg	3 (0.6)	1-2 tabs	tid	3-7
Topical analgesics	3 (0.6)	mouthwash, paste	sos, bid,tid	3-7
Triamcinolone± neomycin	3 (0.6)	paste	bid, tid	5-10
Paracetamol 450mg+ chlormezanone 100mg	2 (0.5)	1-2 tabs	tid	3-7
Listrine	2 (0.5)	10ml mouthwash	tid	10-14
Vitamin B-complex	2 (0.5)	5ml syrup, 1cap	bid, od	10 -15
Calcium	2 (0.5)	250mg tab, 5ml, 10ml syrup	od, bid, tid	10-20
Serratopeptidase	1 (0.2)	15 mg tab	tid	3-5

sos- if required, od-once a day, bid- twice a day, tid- thrice a day, tab- tablet, cap- capsule, tsp- teaspoon, mg- milligram

**Table 4:** Pharmacotherapeutic classification of the drugs with their frequency of prescription

Group	No of prescriptions N=439	Percentage (%)
Analgesics	258*	58.7
NSAID- Paracetamol, Ibuprofen, Nimesulide, diclofenac	250	96.9
Opioids- tramadol	5	1.9
Topical analgesics	3	1.2
Antimicrobial agents	138	31.5
Penicillins	120	86.9
Nitroimidazole	13	9.5
Tetracycline	4	2.9
Topical aminoglycoside	1	0.7
Antiseptics	17	3.9
Chlorhexidine	10	58.8
Betadine	5	29.4
Listrine	2	11.8
Desensitizing agents	10	2.3
Skeletal Muscle relaxants	5	1.2
Topical corticosteroids	3	0.6
Penicillinase inhibitor	3	0.6
Vitamin B complex	2	0.5
Calcium	2	0.5
Serratopeptidase	1	0.2

\* P<0.01



**Fig 1:** Dental diagnosis of the patients. 1= Chronic irreversible pulpitis, 2= Chronic generalized gingivitis, 3= Necrotizing pulpitis, 4= Acute/ Chronic periapical abscess, 5= Dentoalveolar abscess, 6= Over retained tooth, 7= Buccal space infection, 8= Rampant caries, 9= Traumatic tooth mobility, 10= Necrotizing pulpitis with vestibular abscess, 11= Chronic generalized periodontitis, 12= Partially edentulous arch, 13= Operculitis, 14= Recurrent aphthous ulcer, 15= Completely edentulous arches

## Discussion

This study was set to explore the prescription patterns and prevalence of pharmacotherapy in dental outpatients. In dentistry, cognizant and competent procedure oriented dental treatment along with accompanied drug therapy is the arrant of the successful dental treatment. This study showed that the entire patient attending dental out-patient department received drug therapy with mean prescription per patient being 2.2. Significantly higher number of patients (61%, P<0.01) received two drugs though polypharmacy is not evident in this study. Additionally, data in literature showed the mean prescriptions to be 3.72<sup>5</sup>, 2.3 and 1.4<sup>6</sup> in different studies which are not much different from present studies.

Based on this study analgesics were the most commonly prescribed drugs (58.7%, P<0.01) followed by antimicrobials agents (31.5 %). However, similar previous study showed that analgesics were the second most common (36.7%) after antimicrobials (44.9%)<sup>7</sup>. 19.4% (P<0.01) medicines were prescribed by generic names. Previous studies showed that 6.32% to 43.9 %<sup>8</sup> and 57.5%<sup>9</sup>, and 15.1%<sup>10</sup> in different disciplines of medicine and 5%<sup>7</sup> medicines in dentistry were prescribed by generic names. In Nepal's contest, whether prescription by generic name or trade name

is matter of great concern and debate as there are no established norms and standards to monitor the quality of medicines by the government. So, as of now, assurance of quality of prescribed medicines to the patients is incumbent on prescribing doctors and their clinical, scientific and practical knowledge until clear-cut treatment/prescription guidelines are not issued by department of drug administration or health ministry of Nepal.

Eighty-nine percent ( $P < 0.01$ ) medicines were prescribed in solid dosage forms (tablet and/or capsule) followed by syrup (5.7%). Fixed dose combination of paracetamol and ibuprofen was most commonly (28.8%) prescribed analgesic followed by paracetamol (16.7%) and nimesulide (10.3%). Among antimicrobial agents (31.5%), extended spectrum penicillins (mostly the amoxicillin) were the most common (86.9%) antimicrobial agent prescribed to the out-patient dental department. These finding suggest that pain control is the most important factor followed by infection control in out-patient dentistry. And, as the most common pathogens are gram positive bacteria, use of extended spectrum penicillins is justifiable though culture and sensitivity test was not carried out routinely in dentistry. This study showed that oral route and solid dosage form were the most common route and dosage form respectively. Duration of drug therapy was one to twenty one days and frequency was up to four times a day.

Chronic irreversible pulpitis was the commonest diagnosis (28%) followed by chronic generalized gingivitis (27%) (Fig 1). This finding is consistent with previous study which showed prevalence of diagnosis to be the diseases of pulp and periapical tissue (36.5%), gingivitis and periodontal diseases (28.5%)<sup>7</sup>. So dental caries and its corollaries and periodontal diseases are the major burdens for the dental professional to handle till date.

### Conclusion

Analgesics (paracetamol, nimesulide and ibuprofen) were the most common medicines prescribed in dental outpatients followed by extended spectrum penicillins (amoxicillin) and then metronidazole. Most medicines were prescribed by trade names in solid dosage forms through oral route. Duration of therapy was 1-21 days and highest frequency was four times a day for different medicines and their different formulations. Chronic

irreversible pulpitis was the commonest diagnosis followed by chronic generalized gingivitis which led to the visit of patients to the dental outpatient clinics.

### Limitations

Small sample size and only the out-patients were included in this study. Prescription audit including large sample size and both out-patients and in-patients along with consideration to the prescription errors is highly recommended for the complete picture of the prescribing patterns in dentistry.

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