

## STUDY OF DENTAL DISEASE PATTERN AND DRUG UTILIZATION EVALUATION AMONG PATIENTS VISITING DENTAL OUTPATIENT DEPARTMENT OF TERTIARY CARE CENTER

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### ABSTRACT

**Background:** Oral health has been an integral component of general health, with a serious impact on the quality of life and the overall well-being. Limited availability and accessibility of oral health services are risk factors for poor oral health and diseases. This study aimed to observe common dental disease pattern and to evaluate drug utilization pattern among patients visiting Dental Outpatient Department of Dhulikhel Hospital- Kathmandu University Hospital.

**Methods:** A descriptive, cross-sectional study was conducted from October 2018 to January 2019 in Dental Outpatient Department of Dhulikhel Hospital-Kathmandu University Hospital. Two hundred forty prescriptions were collected and analyzed. Descriptive statistical analysis was carried out to find out common dental disease pattern and to evaluate drug utilization pattern.

**Results:** Total 240 prescriptions were analyzed. Pulpitis 54 (22.5%) was the most common diagnosis, followed by periapical abscess 34 (14.16%). Out of 411 drugs prescribed, 166 (40.38%) were analgesics, 116 (28.22%) were antibiotics and 93 (22.62%) were topical agents. Combination of paracetamol with ibuprofen was most commonly prescribed analgesics 133 (80.12%) and combination of amoxicillin with clavulanic acid was most commonly prescribed antibiotics 51 (43.97%). Out of all drugs prescribed, fixed dose combination was given in 194 (47.20%). Only 260 (63.26%) drugs were given by generic name and 133 (32.36%) drugs were from National List of Essential Medicines-Nepal.

**Conclusions:** Awareness among dental doctors for prescribing drugs by generic name and from essential drug lists should be encouraged.

### INTRODUCTION

Oral health has been an integral component of general health.<sup>1</sup> Neglect in oral health frequently lead to serious general health problems, significant pain and interference with eating and over use of emergency room.<sup>2</sup>

Globally, oral diseases constitute a major public health problem.<sup>3</sup> Nepal, being one of the poorest countries, the cost of dental services prohibits the majority of the Nepalese population to access those services.<sup>4</sup> Apart from the use of dental services, drugs such as analgesics, antimicrobials, muscle relaxants and antiseptics are routinely prescribed in dental practice for many conditions.<sup>5</sup> However, World Health Organization (WHO) estimates that more than half of all medicines are inappropriately prescribed, dispensed or sold. Tackling the issue of irrational medicine use is considered to be essential not only to improve healthcare delivery towards ensuring patient safety, but also to allow optimal utilization of resources.<sup>6</sup>

The aim of this study was to find common dental disease pattern and to know drug utilization pattern among patients visiting Dental Outpatient Department (OPD) of Dhulikhel Hospital-Kathmandu University Hospital (DH-KUH).

### METHODS

A descriptive, cross sectional study was conducted in Dental OPD of DH-KUH, Kavrepalanchok, Nepal from October 2018 to January 2019. Ethical approval was obtained from the Institutional Review Committee of Kathmandu University School of Medical Sciences (124/18). Prescriptions of 240 patients visiting Dental OPD and receiving medications irrespective of their age, sex and diagnosis were included in the study. Informed verbal consent was taken from each participant prior to data collection.

Convenience sampling was used. Data was collected from prescriptions of patients visiting Dental OPD of DH-KUH and evaluated for demographic parameters, diagnosis, drugs prescribed including its dose, route of administration, frequency and duration of treatment. Number of drugs per prescription, prescription by generic/trade name, drug from National List of Essential Medicines (NLEM)-Nepal, monotherapy/Fixed Dose Combination (FDC) were also recorded.

Statistical package for Social Sciences (SPSS) version 20 was used for data entry and analysis. Descriptive tests were used and results were expressed as frequency and percentage.

## RESULTS

Prescriptions of 240 patients were analyzed during the study period. Among them, 109 (43.6%) were male, and 131 (52.4%) were female. Mean age of study participants was 34.03±1.70 years. Diagnosis of only the condition for which drugs were given was recorded. Pulpitis was the most common diagnosis 54 (22.5%) followed by periapical abscess 34 (14.16%) (Table 1).

**Table 1: Dental disease pattern**

Dental disease	n (%)
Pulpitis	54 (22.5)
Periapical abscess	34 (14.16)
Impaction/pericoronitis	29 (12.08)
Chronic generalized gingivitis	22 (9.17)
Chronic generalized periodontitis	19 (7.92)
Malocclusion	18 (7.50)
Traumatic ulcer	10 (4.17)
Dentine sensitivity	9 (3.75)
Myalgia	8 (3.33)
Physiological mobility	5 (2.08)
Trauma	4 (1.67)
Apical periodontitis	4 (1.67)
Others*	24 (10)
Total	240 (100)

\*allergic stomatitis, oral candidiasis, space infection, chemical burn, herpes labialis, lichen planus, leucoplakia

Total 411 drugs were prescribed in 240 prescriptions. Among them, 166 (40.38%) were analgesic agents, 116 (28.22%) antibiotics (Table 2).

**Table 2: Prescribed group of drugs**

Drug group	n (%)
Analgesics	166 (40.38)
Antibiotics	116 (28.22)
Topical agents	93 (22.62)
Gastroprotective agents	16 (3.89)
Muscle relaxants	10 (2.43)
Antihistaminics	3 (0.73)
Multiviatmins	3 (0.73)
Enzymes	2 (0.48)
Antifungal	2 (0.48)
Total	411 (100)

Combination of paracetamol and ibuprofen was the most commonly prescribed analgesics 133 (80.12%). Similarly, combination of amoxicillin and clavulanic acid was the most commonly prescribed antibiotics 51 (43.97%). Among all the topical agents, chlorhexidine gluconate 0.2% was the most commonly prescribed mouthwash 33 (35.48%) (Table 3).

**Table 3: Most commonly prescribed drugs**

Drugs	n (%)
<b>Analgesics</b>	
Paracetamol+ibuprofen	133 (80.12)
Paracetamol	18 (10.84)
Ibuprofen	10 (6.02)
Aceclofenac	2 (1.20)
Tramadol	2 (1.20)
Codeine+paracetamol	1 (0.60)
	Total: 166 (100)
<b>Antibiotics</b>	
Amoxicillin+clavulanic acid	51 (43.97)
Amoxicillin	35 (30.17)
Metronidazole	26 (22.41)
Doxycycline	3 (2.57)
Phenoxymethyl penicillin	1 (0.86)
	Total: 116 (100)
<b>Topical agents</b>	
Chlorhexidine gluconate	33 (35.48)
Deltagel/qudragel, hexigel, mucopain	26 (27.96)
Diclofenac gel	11 (11.83)
Desensitizing paste	10 (10.75)
Mouthwash (other than CHX)	9 (9.68)
Others topical gel*	4 (4.30)
	Total: 93 (100)

\* triamcinolone, acyclovir, polysporin

Out of all drugs prescribed, FDC was given for 194 (47.20%). Combination of paracetamol and ibuprofen 129 (66.49%) and amoxicillin with clavulanic acid 50 (25.77%) was most commonly prescribed FDC (Table 4).

**Table 4: Most commonly prescribed FDC**

FDC	n (%)
Paracetamol+ibuprofen	129 (66.49)
Amoxicillin+clavulanic acid	50 (25.77)
Chlorzoxazone+paracetamol	9 (4.65)
Multivitamins	3 (1.54)
Trypsin+chemotrysin	2 (1.03)
Codeine+paracetamol	1 (0.51)
Total	194 (100)

**Table 5: Data on prescribing pattern in Dental OPD**

Indicators	n (%)
Total number of prescriptions	240
Total number of drugs prescribed	411
Average number of drugs per prescription	1.71
Prescriptions of drugs by generic name	260 (63.26)
Prescriptions of drugs containing encounters with antibiotics	90 ( 37.50)
Prescriptions of drugs from National List of Essential Medicines-Nepal	133 (32.36)

Data on prescribing parameters are summarized in Table 5. Out of 240 prescriptions, 123 (51.25%) patients received 1 medication, 75 (31.25%) were given two medications, 32 (13.33%) were given three medications and 10 (4.17%) patient more than three medications.

## DISCUSSION

Oral diseases are among the highest prevalent health conditions affecting 3.5 billion people worldwide.<sup>7</sup> Dental caries and periodontal disease are the most important global oral health burdens. Other burdens include oral cancer, oral mucosal lesions, maxillofacial and dental trauma, developmental disorders and teeth wear.<sup>3</sup> Proper diagnosis of a dental condition and its management with dental procedure and use of drugs plays a pivotal role in dental care.<sup>5</sup> Irrational drug use is prevalent, especially in the developing countries, reasons being irrational prescribing, dispensing and administration of medications. Drug utilization studies seek to monitor, evaluate, and suggest modifications in prescribing practices with the aim of making medical care rational and cost effective and may be useful in maximum utilization of resources.<sup>8</sup>

This study was carried out to evaluate the pattern of presentation of oral conditions and drug utilization in patients who visited the dental OPD of DH- KUH. In this present study, pulpitis was the most common presentation (22.5%) for which patients were given medications, followed by periapical abscess (14.16%) and pericoronitis (12.08%). The result was similar to the national studies<sup>9,10</sup> in which dental caries (37%) and chronic irreversible pulpitis (28%) was the most common diagnosis. The data was also similar to international study<sup>11</sup> where dental caries and its sequelae (73.1%) was the most common diagnosis among patients seeking dental treatment. Dental caries, the most prevalent oral diseases, result from the activity of bacterial plaque. Fermentation of sucrose and other non-milk extrinsic sugars to lactic and other acids causes tooth decalcification and proteolysis, resulting in cavitation and caries. Untreated caries can progress through the dentine to the pulp, leading to pulpitis and necrosis of the pulp eventually. Inflammation can then spread around the tooth apex, eventually forming an abscess, granuloma, or cyst.<sup>12</sup>

Analgesics (40.38%) followed by antibiotics (28.22%) were the most commonly prescribed drug group. The results were similar to the study where analgesics and antibiotics were frequently group of prescribed drugs.<sup>9</sup> Odontogenic pain due to periapical and pulpal disease is considered as the most frequent pain in dental health settings. The majority of clinical indications of analgesic prescriptions relate to the treatment of acute and chronic dental pain and adjunctive intraoperative and postoperative pain.<sup>13</sup> Diseases of the dental pulp and periapical tissue are caused by microorganisms; however, not all cases of endodontically involved teeth require the administration of systemic antibiotics. The majority of endodontic infections do not require systemic antibiotic therapy when the cause of the infection has been properly managed by complete debridement of the pulp.<sup>14</sup>

Among the antibiotics, combination of amoxicillin and clavulanic acid was the most commonly prescribed drugs (43.97%), followed by amoxicillin (30.17%) and metronidazole (22.41%). This was similar to the study conducted by Roda et al,<sup>15</sup> in which combination of amoxicillin and clavulanic acid was the most common antibiotics prescribed, whereas in the study done by Sharma et al,<sup>16</sup> amoxicillin alone was the most commonly prescribed antibiotics in dental practice. Since control and prevention of infection is an important factor in outpatient dentistry and the most common pathogens are gram-positive bacteria, so the use of systemic antibiotics like amoxicillin is justified.<sup>17</sup> The inactivation of amoxicillin by beta-lactamases can be circumvented by the addition of clavulanic acid, a beta-lactamases inhibitor. But according to the retrospective chart study<sup>18</sup> which included different studies, reported there was no difference between amoxicillin and combination of amoxicillin with clavulanic acid combination in treating infections successfully. Antimicrobials are invaluable adjuncts in the management of orofacial infections. Although they are not a substitute for definitive treatment, their judicious use can shorten infection periods and minimize associated risks.<sup>19</sup> However, overuse of antibiotics leading to antibiotics resistance should also be kept under consideration.

Out of all analgesics prescribed, 80.12% of analgesics was given as combination of ibuprofen and paracetamol which was in higher level when compared to the study,<sup>16</sup> where the same combination was used in 42.7%. Combining these two non-steroidal anti-inflammatory drugs does not improve the efficacy of treatment as they act on the same enzyme and offer no synergism. Such irrational combinations expose patients to unnecessary risk of adverse drug reactions and needlessly increase the cost of therapy.<sup>20</sup>

In this study, chlorhexidine gluconate 0.2% was the most commonly prescribed topical agent (35.48%) which was similar to study<sup>21</sup> where antimicrobial effect of chlorhexidine was more when compared to other mouthwashes. Chlorhexidine is the most effective and most thoroughly tested antiplaque and anti-gingivitis agent known till today. It is effective in preventing and controlling plaque formation, breaking up existing plaque, and inhibiting and reducing the development of gingivitis.<sup>22</sup>

The mean number of drugs prescribed in the present study was 1.71 per prescription. Studies suggest this value ranging from 1.3 as reported by a study conducted in twelve developing countries<sup>23</sup> to 4.51 as reported by a study conducted at South-east Asian country.<sup>24</sup> In this study, percentage of encounters with an antibiotics prescribed was 37.50%. According to the study,<sup>23</sup> percentage of encounters with antibiotic prescription ranged from 23% in Bangladesh to 63% in Sudan. Overuse of antibiotics causes adverse events, contributes to antibiotic resistance, and unnecessary treatment costs.<sup>25</sup>

Percentage of drugs prescribed by generic name was found only in 63.26%, out of all drugs prescribed. This data differed from the national study<sup>10</sup> where drug prescription by generic name was nil and international study<sup>26</sup> where prescription of

drugs by generic name was high (93.3%). Use of generic name should be encouraged in developing countries like Nepal to make therapy cost-effective without compromising quality, limit commercial influence by pharmaceutical companies and reduce the potential for prescribing errors.<sup>27</sup>

In this study, drugs prescribed from National NLEM-Nepal was 32.36%, which is very less as compared to study done in Western Nepal which reported 75.6% on the same parameter.<sup>28</sup> Prescribing from EML, especially in developing countries like Nepal, is important as drugs are selected with according to local disease prevalence and they promote the availability, accessibility, affordability, quality, safety and rational use of medicines.<sup>29</sup>

Out of all drugs prescribed, FDC was prescribed in 47.20%. Combination of paracetamol with ibuprofen was given in 66.49% and combination of amoxicillin with clavulanic acid was given in 25.77%. It is widely accepted that most drugs should be formulated as single compound. FDC products are acceptable only when the dosage of each ingredient meets the requirement of a defined population group and when the combination has a proven advantage over single compound administered separately in therapeutic effect, safety or compliance. Irrational FDC expose patients to unnecessary risk of adverse drug reactions and also impose an unnecessary financial burden on consumers.<sup>30</sup>

The study was conducted in only one center with small sample size, hence the result cannot be generalized. Multicentric studies with large sample size are required to know the complete pattern of dental disease distribution and evaluation of drug utilization used for treatment of dental diseases. Convenience sampling method was used, which could have led to selection bias of research participants. This limitation could have been prevented by using random sampling.

## CONCLUSIONS

This study gave us an overall pattern of drug use in Dental OPD of DH-KUH. Drug utilization with brand names and FDC were frequent. The prescribing practices in this study are not satisfactory, as suggested by over prescription of antibiotics and lack of awareness of NLEM-Nepal. It is important to create awareness about the rational use of drugs among dental doctors, the importance of prescribing drugs with generic names and avoidance of FDC in unnecessary cases to increase cost-effectiveness and decrease adverse drug reactions of medications.

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