

Analgesic and Anti-Inflammatory Prescription Pattern in the Dental Clinic of the Bingham University Teaching Hospital, Jos, Nigeria

Toluwanimi Alexis Ogundeko ¹, Timothy Olugbenga Ogundeko ²,
Bamidele Victor Babatunde ², Ayuba Clagba Sanni ³, Olusayo Moritiwon ³,
Mamzhi Seljul C. Ramyil ², Paul Amos Bassi ⁴

¹ *Lagos State University College of Medicine*

P. M. B. 21266, 1-5 Oba Akinjobi Way, G.R.A., Ikeja, Lagos, Nigeria

² *Bingham University*

P. M. B. 005, KM 26 Abuja-Keffi Expressway Kodope, Karu, Nasarawa State, Nigeria

³ *University of Jos*

P. M. B 2084, Jos, Nigeria

⁴ *Nile University of Nigeria*

Plot 681, Cadastral Zone C-00, Research & Institution Area, Jabi Airport Bypass, Abuja FCT, 900001, Nigeria

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Corresponding Author:

Timothy Olugbenga Ogundeko

tim_ogundeko@yahoo.com

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Abstract. This retrospective cross-sectional study evaluated the prescription patterns of analgesic and anti-inflammatory drugs at the Dental Clinic of Bingham University Teaching Hospital (BhUTH), Jos, Nigeria, from January 2022 to July 2024. The review covered a total of 179 patient records, focusing on case classification (surgical vs. non-surgical), demographics, and prescribed medications. Non-surgical cases predominated (86.6%), with a nearly equal gender distribution, although males were more likely to undergo surgical procedures. Out of 183 prescriptions analysed, paracetamol accounted for 71.6%, followed by nonsteroidal anti-inflammatory drugs (NSAIDs), such as diclofenac (25.1%), and combination NSAID-prostaglandin formulations, including Arthrotec (3.3%). The strong preference for paracetamol reflects its perceived safety profile and effectiveness in managing mild to moderate dental pain. These findings reflect a conservative, evidence-based approach to dental pharmacotherapy, emphasising nonopioid analgesics for routine dental care at the Dental Clinic in BhUTH, Jos, Nigeria. Experts recommend providing regular updates on drugs used in pain management, as prescribers tend to focus on NSAIDs at the expense of other options.

Keywords: Dental pain; analgesics; NSAIDs; dentistry; prescription; BhUTH

INTRODUCTION

There is valuable evidence for a significant relationship between nonrational use of analgesics and diminution of drug therapy, increased adverse drug reactions and socioeconomic consequences [1, 2]. Nevertheless, the prescription of analgesic drugs for dental indications is often accompanied by challenges, which diminish the treatment success and increase the potential risk for serious adverse effects [3]. A significant amount of information requires operative intervention and should be addressed with analgesics

and antibiotics due to dental pain originating from acute or chronic pulpal infections [4]. Dental clinicians employ a comprehensive approach that involves the pharmacological, biological, and psychosocial aspects of pain management to ensure effective, low-risk pain treatment [3].

There is an irregularity among practitioners regarding the length, drug choice, frequency, and necessity of prescribing them based on the literature review [5]. Consequently, experienced dental clinicians select a safe and effective analgesic therapy, using individual drugs or various anal-

gesic combinations, to treat dental pain based on individual patient conditions. This selection in dental practice is not always simple due to numerous confounding factors related to the mechanism and clinical manifestation of pain [6]. In general, this difference in prescribing may be influenced by the varying practices of different practitioners across countries, as well as the less-reported side effects of medications and their effectiveness in various indications [7]. Analyses of prescriptions for analgesics help provide feedback on the safety and efficacy of these medications, thereby raising the standards of clinical pharmacotherapy [8]. Drug utilisation studies are useful quantitative tools for providing feedback on analgesic use and for identifying measures to improve the quality of dental pain therapy, particularly in light of the increasing rate of analgesic prescriptions [3]. Pain management is often guided by the 3 "D" principle of diagnosis, dental treatment, and drugs, as eradicating the cause is the primary task for a dental surgeon [9]. Nonpharmacological measures include health education for children and a psychological approach to alleviate the perception of fear and other behavioural problems in children, as well as breathing techniques, hypnosis, transcutaneous electrical nerve stimulation, guided imagery, acupuncture, relaxation, and other methods to relieve pain [10]. Several conditions may affect the success of analgesic treatment in dental patients. Dental professionals should carefully consider the placebo effect. Initially, dental doctors should address the potential renal and hepatic toxic effects, including gastrointestinal disturbances, which may impact the pharmacokinetic and safety profile [3]. Several factors play a crucial role in selecting analgesic drugs for dental pain treatment, including pathophysiological pain mechanisms, patient age, route of administration, and patient-related factors [3].

Paracetamol (Nonopioid analgesics) is widely used in dental pain as an antipyretic analgesic along with nonsteroidal anti-inflammatory medications (NSAIDs) [11]. For opioids, a low dose of tramadol is considered the second choice in this group of patients after acetaminophen [12]. In the treatment of mild to extreme dental pain, opioid analgesics are often rarely used [13, 14]. However, recently, different studies reported a drop of 5.6% in the prescribing of opioids [15, 16]. In cirrhotic patients, NSAIDs should be avoided or used with extreme caution due to the increased risk of gastrointestinal bleeding and

risk of hepatotoxicity, acute hepatic decompensation or risk of renal failure [3]. In individuals using over-the-counter (OTC) NSAID analgesics, increased caution is warranted – particularly among older adults or those living with rheumatoid arthritis – who are also taking NSAIDs, low-dose aspirin, ACE inhibitors, or diuretics. The shortest duration of treatment is required, and the lowest effective doses of NSAIDs are crucial in their efficacy and safety [17]. Analyses of prescriptions for analgesics help provide feedback on the safety and effectiveness of these drugs, thereby raising the standards of clinical pharmacotherapy [8]. With dental services currently altered, dentists are being asked to provide advice, analgesia, and antibiotics in situations where they would usually offer operative care [18].

Therefore, the purpose of this study was to evaluate the pattern of analgesic and anti-inflammatory prescriptions in the Dental Clinic of the Bingham University Teaching Hospital in Jos, Nigeria.

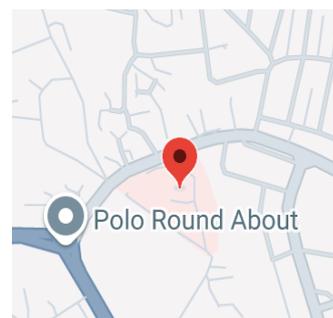


Figure 1 – Google map location of BHUTH [19]

METHODS

Study design. This was a cross-sectional, hospital-based retrospective analysis of analgesic and anti-inflammatory prescription patterns in the Dental Unit of the Bingham University Teaching Hospital (BhUTH), Jos, Nigeria, between January 2022 and July 2024.

Data collection and analysis. Data, including the age and sex of patients, cases (surgical and non-surgical), and drugs (analgesic and anti-inflammatory) prescriptions of a total of 179 clients accessing treatment at the Dental Unit of the Bingham University Teaching Hospital (BhUTH), Jos, Nigeria between January 2022 and July 2024. The categorisation of cases aligned with general medical and dental classification systems where surgical procedures involve incisions, anaesthesia, or significant tissue manipulation, while non-

surgical procedures involve surface-level or less invasive techniques. Cases requiring special procedures, including tooth extractions involving incisions and other technical interventions, were considered surgical. Dental Curettage (Subgingival Curettage), which involved specialised techniques, was also considered a surgical procedure. Oral and Maxillofacial surgeries were also registered under surgical cases. Procedures such as Scaling and Polishing, Normal (Simple) tooth extractions, and Root Canals were classified as non-surgical, as reported by authors [20]. The data collected were analysed using descriptive statistics in the form of charts and tables.

RESULTS AND DISCUSSION

In terms of case distribution, our study shows that, out of a total of 179 cases, surgical cases account for 24 (13.4%), while non-surgical cases comprise 155 (86.6%). Additionally, the gender distribution was 93 males (52%) and 86 females (48%), respectively. Moreover, the Surgical cases' gender breakdown was 16 (66.6%) males and 8 (33.4%) females, as shown in Table 1.

Table 1 – Cases Handled in the Dental Clinic of BhUTH

Case	Males	Females	Total
Surgical	16 / 17,2 %	8 / 9,3 %	24 / 13,4 %
Non-surgical	77 / 82,8 %	78 / 90,7 %	155 / 86,6 %
Total	93 / 100 %	86 / 100 %	179 / 100 %

Non-surgical dental cases dominate, accounting for the majority (86.6%). These likely include common conditions like caries, periodontal issues, and minor infections. Males were more likely to undergo surgical interventions, potentially indicating a gender difference in the severity of dental conditions at presentation or health-seeking behaviour. The overall male-to-female ratio is slightly skewed in favour of males (52% vs. 48%).

Looking at drug prescription patterns, from a total of 183 prescriptions, our study showed Nonopioid analgesics (e.g., paracetamol): 131 (71.6%), NSAIDs (e.g., Ibuprofen, diclofenac, ketoprofen, celecoxib): 46 (25.1%) and NSAIDs + Prostaglandin (e.g., Arthrotec): 6 (3.3%). The most prescribed drug was paracetamol (acetaminophen), with 131 prescriptions – Table 2 & Figure 2. Consequently, there is a strong prefer-

ence for paracetamol, likely due to its favourable safety profile, efficacy in managing mild to moderate pain, and minimal gastrointestinal side effects. Surprisingly, despite its long history as a painkiller, the mechanism of action of acetaminophen is still not completely understood [21]. NSAIDs account for about a quarter of prescriptions, with diclofenac being the most common among them. Moreover, Selective COX-2 inhibitors (e.g., celecoxib) and combination NSAIDs with prostaglandins (e.g., Arthrotec) are used sparingly, possibly reserved for patients at a higher risk of NSAID-induced gastric irritation. The use of Bonjela gel and ketoprofen is infrequent, suggesting that they are not commonly prescribed in local practices (Table 2).

Table 2 – Prescription distribution by generic name, drug class and sub-class in DC-BhUTH

Drug (Generic name)	Class	Frequency
Paracetamol (acetaminophen)	Nonopioid analgesics	131
Ibuprofen	NSAIDs	11
Diclofenac	NSAIDs	32
Ketoprofane	NSAIDs	1
Celecoxib (Celebrex)	NSAIDs	1
Bonjela gel	NSAIDs	1
Athrotec (diclofenac sodium/misoprostol)	NSAIDs and prostaglandin	6

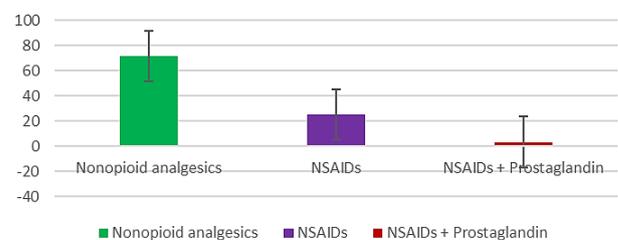


Figure 2 – Percentage (%) Prescription pattern based on drug class in DC-BhUTH

Our study aligns with various reports highlighting the effectiveness of paracetamol and NSAIDs, particularly Ibuprofen, in managing pain in dental and medical practices. Acetaminophen, also known as N-acetyl-para-aminophenol (APAP) or paracetamol in many countries, is a nonopioid analgesic and antipyretic agent utilised for treating pain and fever [22]. The drug of choice from the NSAIDs group for the treatment of mild odontogenic pain is Ibuprofen 200 mg or naproxen 200–225 mg individual dose. In patients with persistent mild dental pain, the combination of

Ibuprofen or naproxen with paracetamol is more effective than individual NSAID agents. Where NSAIDs are contraindicated, the appropriate choice is 500–1000 mg of paracetamol [3]. Non-steroidal anti-inflammatory drugs (NSAIDs) are drugs commonly prescribed in dental practice for the management of pain and swelling. Of these substances, paracetamol and Ibuprofen are the most widely used. Their mechanism of action is based on the inhibition of cyclooxygenase, thereby inhibiting prostaglandin synthesis. All of these drugs share a similar mechanism of action, resulting in similar side effects. The most frequent range from mild (e.g., nausea or vomiting) to serious gastric problems (such as gastric bleeding or perforation) [23]. In patients with mild dental pain, the first lines of analgesics are the non-steroidal anti-inflammatory drugs (NSAIDs). NSAIDs can be prescribed in over-the-counter doses and, in some cases, in combination with other painkillers such as paracetamol [24].

CONCLUSIONS

The data reflect a conservative approach to dental pharmacotherapy, with a high reliance on

well-established analgesics. Paracetamol is the backbone of dental pain management at the prescription in the Dental Clinic of the Bingham University Teaching Hospital, Jos, Nigeria. The limited use of surgical interventions may indicate a higher prevalence of manageable dental conditions or delayed presentation of severe cases. Additionally, the clinic demonstrates gender inclusivity in its care, with a relatively balanced male-to-female patient ratio. Regular updates on drugs used in the management of pain are recommended as there is a tendency for the prescriber to concentrate on the particular use of NSAIDs at the detriment of others.

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