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Original Research Article

Assessment of Pain Management Practices and Analgesic Prescription Patterns among Dental Practitioners in Indian Settings

Manjula S[1*], Krishna Kumar M[2]

[1]Sr. Vice President, Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India
[2]Sr. General Manager, Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India

***Corresponding Author:** Manjula S
Sr. Vice President, Department of Medical Services, Micro Labs Limited, Bangalore, Karnataka, India

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Abstract: ***Objective*:** To evaluate the patterns of pain presentation, management strategies, and medication preferences among dental practitioners, with a specific focus on analgesic prescription practices in various dental conditions. ***Methods*:** A cross-sectional study was conducted among dental practitioners using the 24-item questionnaire to gather expert opinions on pain patterns, patient demographics, treatment timelines, and drug prescription practices. Descriptive statistics were used for analysis, with results visualized through pie and bar charts created in Microsoft Excel. ***Results*:** This study involved 69 clinicians and most of them (62.32%) identified dental pulpitis as the most common source of pain, with 50.72% reporting that 51-75% of their patients presented with pain complaints. For third molar pain, 37.68% of clinicians noted impacted teeth as the most frequent cause. Regarding treatment, aceclofenac was the most prescribed analgesic following surgical procedures and root canal treatments (92.75%). The preferred combination for managing pain lasting less than 5 days was aceclofenac + paracetamol + serratiopeptidase, favored by 78.26% of clinicians. The survey also found that patients typically experienced pain for 4-7 days before seeking care for dental pulpitis, and many patients were unaware of the complications related to third molar impactions (50.72%). ***Conclusion*:** Aceclofenac is the primary analgesic for dental pain management among surveyed clinicians, commonly used across various procedures. While single-agent therapy with aceclofenac is preferred, combination therapy with paracetamol and serratiopeptidase is frequently used for more complex or severe cases. This reflects a tiered approach to pain management, adjusting treatment based on procedure and patient needs.

Keywords: Dental Pain, Root Canal Treatment, Aceclofenac, Paracetamol, Serratiopeptidase.

INTRODUCTION

The World Health Organization (WHO) Global Oral Health Status Report 2022 highlights that nearly 3.5 billion individuals around the world are impacted by oral diseases, with a significant 75% of those affected residing in middle-income countries. Furthermore, approximately 2 billion subjects are estimated to suffer from caries in their permanent teeth, while 514 million children experience caries in their primary teeth. According to the Global Burden of Disease 2021, untreated dental caries in permanent teeth stands as the most prevalent health issue globally [1].

Dental diseases pose a significant public health challenge in India, with dental caries impacting 50–85% and periodontal diseases affecting 60–90% of the population [2]. A systematic review and meta-analysis examined the pooled prevalence of dental pain among children and adolescents. An analysis of 97 studies conducted through June 2019 revealed prevalence rates ranging from 1.33% to 87.8%. The highest prevalence was reported in studies from Africa (50.1%), followed by India (40.4%), China (41.3%), and Iran (42.6%) [3]. Dental pain significantly affects children's daily lives, disrupting sleep, eating, school performance, recreation, and increasing absenteeism. It also impacts families through interrupted routines, strained relationships, emotional distress, and financial burdens, with lower socioeconomic groups experiencing greater challenges [4].

Pain management is a critical aspect of dental practice, as it plays a vital role in improving clinical outcomes and patient satisfaction. Many patients seek dental care primarily to address pain caused by dental or periodontal conditions. Additionally, dental procedures can be inherently painful, with postoperative discomfort often lasting for several days. To effectively manage and prevent pain, particularly pain associated with inflammation or surgery, dentists must prescribe appropriate analgesics [5]. Among the various analgesic options available, nonsteroidal anti-inflammatory drugs (NSAIDs) and aniline analgesics are the most used in dental practice [6]. The choice of analgesics and additional medications, such as muscle enzyme combinations, plays a crucial role in patient comfort and treatment success.

Aceclofenac, a phenylacetic acid-derived NSAID, provides strong anti-inflammatory and analgesic effects by selectively inhibiting COX-2, reducing prostaglandin production. It offers efficacy comparable to diclofenac, particularly for conditions like dental pain, while ensuring better gastrointestinal tolerance and minimal impact on platelet function [7, 8]. Paracetamol is a widely used non-opioid analgesic with antipyretic properties, effective for pain relief and fever reduction with minimal side effects. Unlike NSAIDs, it has weak anti-inflammatory activity and primarily acts centrally, possibly by inhibiting the COX-3 enzyme or modulating the oxidative state of cyclooxygenase. Its unique mechanism sets it apart from traditional NSAIDs [9].

Serratiopeptidase is an enzyme that breaks down toxins and inflammatory debris without affecting healthy tissue. It reduces swelling, activates fibrinolysis, and regulates inflammation by modifying cell adhesion molecules. Its analgesic effects arise from cleaving bradykinin, a pain mediator. The enzyme also accelerates inflammation resolution by breaking down fibrin, thinning inflammatory fluids, and inhibiting bradykinin to alleviate pain [10].

This study aims to provide insights into the current practices of dental pain management by surveying dental practitioners about their clinical experiences and preferred treatment approaches. Understanding these patterns is essential for establishing evidence-based guidelines and improving the standard of care in dental pain management.

METHODOLOGY

We carried out a cross-sectional study among dental practitioners in managing dental pain in the major Indian cities from June 2023 to December 2023.

Questionnaire

The questionnaire booklet named CORAL-D (Clinical opinion and perspectives on Analgics for Pain management in Dentistry) study was sent to the Dentists who were interested to participate. The CORAL-D questionnaire booklet consisted of 24 comprehensive questions that addressed various aspects of dental practice, including pain presentation patterns, patient demographics, clinical presentation timelines, treatment approaches, drug prescription patterns, patient awareness, and educational methods. The study was conducted after receiving approval from Bangalore Ethics, an Independent Ethics Committee which was recognized by the Indian Regulatory Authority, Drug Controller General of India. Survey questions was developed using the methods designed to collect perspectives from the dental practitioners. Reliability as determined by a split-half test (coefficient alpha) was adequate but should be improved in future versions of the questionnaire. A study of criterion validity was undertaken to test the questionnaire and to develop methods of testing the validity of measures of Dental Practitioners Perspectives. However, the extraneous variable in this includes the clinicians experience, usage of the newer drugs etc. The two criteria used were the doctors' perspectives from the clinical practice and the assessment of an external assessor and statistician.

Participants

An invitation was sent to leading Dentists in managing dental pain in the month of March 2023 for participation in this Indian survey. About 69 Dentists from major cities of all Indian states representing the geographical distribution shared their willingness to participate and provide necessary data. Dentists were requested to complete the questionnaire without discussing with peers. A written informed consent was obtained from each Dentists prior initiation of the study.

Statistical Analysis

The data were analysed using descriptive statistics. Categorical variables were presented as percentages to provide a clear insight into their distribution. The frequency of occurrence and the corresponding percentage were used to represent the distribution of each variable. To visualize the distribution of the categorical variables, pie, and bar charts were created using Microsoft Excel 2013 (version 16.0.13901.20400).

RESULTS

The survey involved 69 practitioners, and 62% of clinicians identified dental pulpitis as the most common presentation of pain in their practice. Nearly 51% reported that 51–75% of their patients present with pain complaints in routine settings. A total of 77% of clinicians stated that dental pulpitis or pain due to root canal treatment (RCT) is equally

common in both genders. Additionally, 56.52% of clinicians reported that 11–25% of their OPD patients complain of dental pulpitis caused by dental caries. Approximately 48% of dentists indicated that patients with dental pulpitis due to dental caries typically experience pain for 4–7 days before seeking dental care. Around 38% identified an impacted tooth as the most common source of third-molar pain in their clinical practice. Nearly half (50.72%) of dental practitioners reported that 6–15% of their patients are aware of third molar impactions and associated complications.

A total of 49.28% of clinicians reported that 11–20% of their patients present with tooth fractures. Similarly, 35% of the clinicians identified hard food as the most common cause of tooth fractures in their practice, closely followed by falls (33.33%). Approximately 40% of the dental practitioners reported that only 3–5% of their patients are aware of the importance of preserving a fractured or avulsed tooth following blunt trauma.

Additionally, 51% of clinicians reported that less than 10% of their patients use cold packs for traumatic injuries before visiting the dentist. For patient education, 43% of clinicians preferred mass education through social media or individual one-on-one sessions to raise awareness about dental infections. Regarding post-surgical tooth extraction care, 41% of clinicians recommended muscle relaxants for 11–25% of their patients. Approximately 75% of clinicians identified chlorzoxazone as their most commonly preferred muscle relaxant.

Most respondents (92.75%) reported prescribing aceclofenac as the most common analgesic following the surgical extraction of impacted third molars or other surgical procedures (Figure 1). A similar proportion of clinicians (92.75%) indicated prescribing aceclofenac as the most common analgesic within 24 hours of an RCT procedure. Approximately 93% also preferred aceclofenac as the analgesic of choice for managing orofacial pain associated with the periodontium (Table 1).

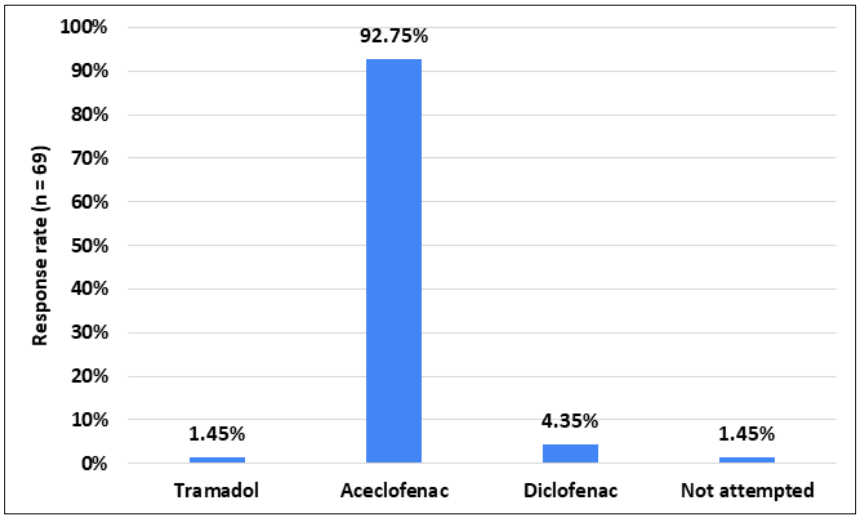

Figure 1: Distribution of response to most commonly prescribed analgesics post-surgical extraction

Table 1: Distribution of response to most commonly prescribed analgesics

Analgesics	Response rate (n = 69)
For RCT within 24 hours	
Aceclofenac	64 (92.75%)
Diclofenac	3 (4.35%)
Etoricoxib	1 (1.45%)
Not attempted	1 (1.45%)
For periodontium-related orofacial pain	
Aceclofenac	64 (92.75%)
Diclofenac	3 (4.35%)
Etoricoxib	1 (1.45%)
Not attempted	1 (1.45%)

A total of 62% of the respondents reported that 11–25% of their patients undergoing surgical procedures, such as post-surgical extraction of impacted third molars, require combination treatment. Additionally, 78% of the clinicians preferred the combination of aceclofenac, paracetamol, and serratiopeptidase for managing pain lasting less than five days (Table 2). Approximately 38% of the experts reported prescribing serratiopeptidase to 11–25% of patients following root canal treatment procedures.

Table 2: Distribution of response to preferred combination for pain management (<5 days)

Preferred combination for pain management	Response rate (n = 69)
Aceclofenac + paracetamol+ serratiopeptidase	54 (78.26%)
Aceclofenac + paracetamol + chlorzoxazone	9 (13.04%)
Aceclofenac + paracetamol	5 (7.25%)
Not attempted	1 (1.45%)

Around 46% of the clinicians reported that 11–25% of their patients undergoing RCT require combination treatment (Figure 2). A significant proportion (75.36%) of clinicians preferred the combination of aceclofenac, paracetamol, and serratiopeptidase for patients undergoing RCT (Table 3). Additionally, 62.32% of clinicians favored using this combination for a duration of five days in patients with dental pulpitis pain (Figure 3). About 55% of clinicians reported prescribing this combination to 11–20% of patients experiencing temporomandibular joint (TMJ) stiffness (Figure 4).

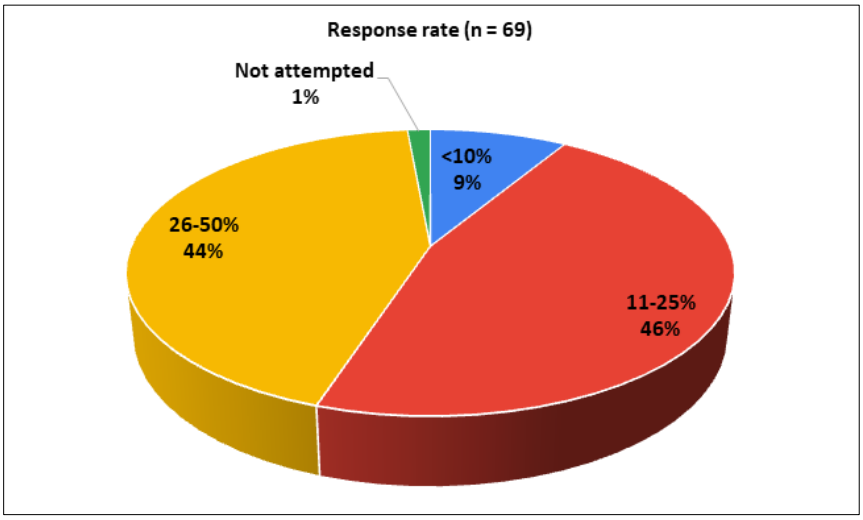

Figure 2: Distribution of response to proportion of patients requiring combination treatment post-RCT

Table 3: Distribution of response to preferred combination for patients undergoing RCT

Combination	Response rate (n = 69)
Aceclofenac + paracetamol+ serratiopeptidase	52 (75.36%)
Aceclofenac + paracetamol+ chlorzoxazone	4 (5.8%)
Aceclofenac + paracetamol	12 (17.39%)
Not attempted	1 (1.45%)

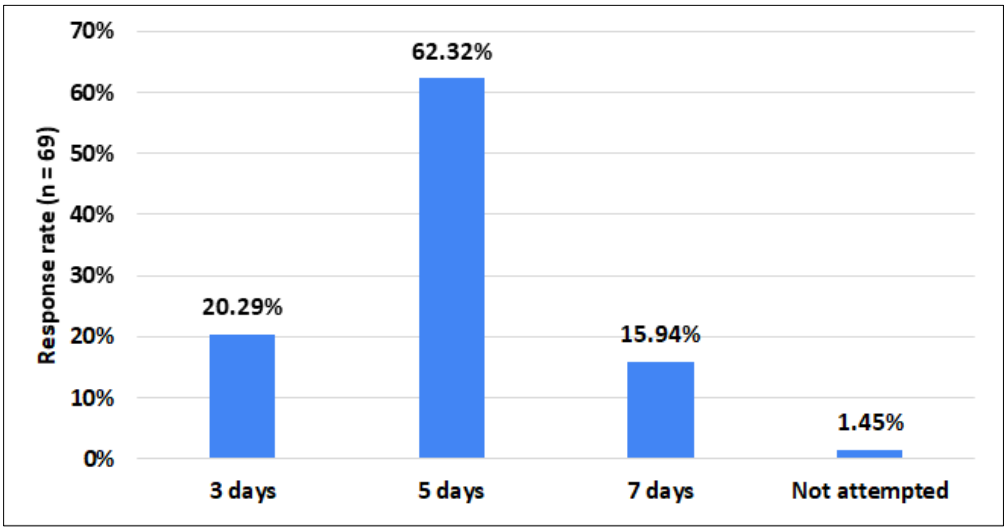

Figure 3: Distribution of response to duration of aceclofenac + paracetamol + serratiopeptidase use for dental pulpitis pain

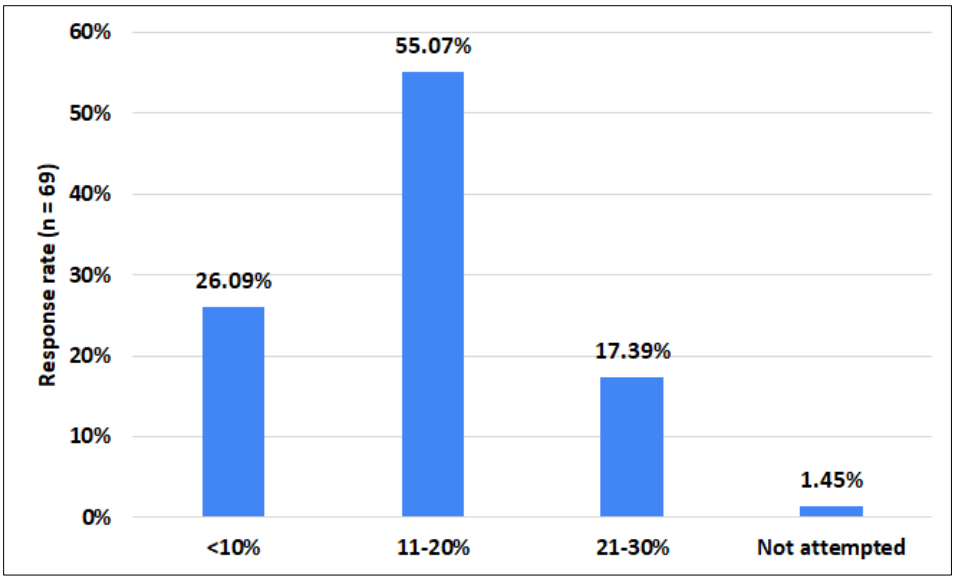

Figure 4: Distribution of response to proportion of patients with TMJ stiffness prescribed aceclofenac + paracetamol + serratiopeptidase

DISCUSSION

The study reveals a strong preference among dental practitioners for aceclofenac as the primary analgesic across multiple dental procedures and conditions in Indian settings. The notably high proportion of clinicians choosing aceclofenac for post-surgical extraction of impacted third molars or other surgical procedures, RCT, and periodontal pain management suggests its established efficacy in addressing various types of dental pain.

A comparative study by Chunduri *et al*., highlighted that aceclofenac is a highly effective and superior analgesic for managing moderate to severe acute pain following third molar surgery. It demonstrated a faster onset of action, and a longer duration of pain relief compared to diclofenac, while also exhibiting a better tolerability profile [7]. Jyothsna *et al*., demonstrated that aceclofenac 100 mg BD is a more effective and safer option than diclofenac sodium 50 mg TID for managing post-extraction dental pain. Aceclofenac showed a statistically significant reduction in pain intensity within the first 8 hours after surgery and achieved complete pain relief by day 5, outperforming Diclofenac. Additionally, aceclofenac exhibited a superior gastrointestinal safety profile, making it a preferred choice for pain management in the immediate postoperative period following third molar extraction [11].

Clinicians predominantly opt for a triple combination therapy of aceclofenac, paracetamol, and serratiopeptidase, particularly in cases lasting under 5 days. While single-agent therapy with aceclofenac is the primary preference, the majority of the clinicians reported that 11–25% of their patients require combination therapy. This suggests that a significant proportion require more comprehensive pain management approaches. The high preference for aceclofenac, paracetamol, and serratiopeptidase therapy in root canal cases indicates clinicians' recognition of the potentially severe pain associated with this procedure. The study also provides insights into pain management strategies for specific conditions such as dental pulpitis and TMJ stiffness. The preference for a 5-day duration of aceclofenac, paracetamol, and serratiopeptidase therapy in pulpitis cases (majority of clinicians) reflects a standardized approach to managing this common condition. The more selective use of combination therapy in TMJ stiffness cases, with most clinicians prescribing it to only 11-20% of patients, suggests a more targeted approach based on individual patient needs.

A study conducted by Pavithra *et al*., involving 85 patients with acute dental pain caused by irreversible pulpitis found that aceclofenac 100 mg exhibited a more effective analgesic response compared to ibuprofen 400 mg in this patient population [12]. In a study by Mehlisch *et al*., the analgesic effects of paracetamol (1 g), aspirin (650 mg), and placebo were tested in a double-blind, randomized trial involving 162 dental surgery patients experiencing moderate to severe pain. Over six hours, both paracetamol and aspirin provided significantly better pain relief compared to placebo ($P < 0.05$). Paracetamol notably excelled, achieving greater reductions in maximum pain intensity ($P < 0.05$), improved overall pain relief ($P < 0.03$), and better global evaluations ($P < 0.02$), especially among patients with severe pain. These results underscore superior effectiveness of paracetamol in treating post-surgical dental pain [13]. In a multicenter, double-blind, placebo-controlled trial of 174 patients undergoing Caldwell-Luc antrotomy for chronic empyema, those treated with serratiopeptidase (10 mg, given pre- and post-surgery) showed significantly less buccal swelling up to the fifth postoperative day ($P < 0.01$ to $P < 0.05$). The peak swelling was also notably smaller in the serratiopeptidase group. No

adverse effects were reported, suggesting that serratiopeptidase is a safe and effective treatment for reducing post-surgical inflammation [14].

Murthykumar *et al*., demonstrated that a combination of aceclofenac, paracetamol, and serratiopeptidase is frequently prescribed as an analgesic and anti-inflammatory treatment for managing postoperative pain after implant surgery [15]. Pant *et al*., suggested that a combination of aceclofenac, paracetamol, and serratiopeptidase is an effective and well-tolerated option for managing postoperative pain and inflammation. The study findings showed significant improvements in mean pain scores, which decreased from 2.66 at baseline to 1.36 after 48 hours and to 0.8 by the study's end [16].

This comprehensive survey study provides valuable insights into dental pain management practices and prescription patterns among dental practitioners. The findings offer crucial benchmarking data for standardizing treatment protocols, particularly in analgesic prescriptions and combination therapy approaches. The study's examination of patient presentation patterns, awareness levels, and treatment timing preferences significantly contributes to understanding current clinical practices. However, the study presents several notable limitations that should be considered when interpreting its findings. The relatively small sample size of practitioners may limit the generalizability of the results to broader dental practice settings. While the cross-sectional design offers valuable insights, it provides only a snapshot view without temporal trends. Additionally, the reliance on self-reported data through predetermined percentage ranges may have introduced recall bias and limited the precision of reported frequencies. Further research could explore the comparative efficacy of these treatment approaches and their impact on patient outcomes, particularly focusing on the role of combination therapy in specific dental conditions.

CONCLUSION

Aceclofenac emerges as the cornerstone of dental pain management among surveyed clinicians, with widespread use across various dental procedures. While single-agent therapy with aceclofenac is the primary choice, clinicians regularly employ combination therapy with paracetamol and serratiopeptidase for more complex cases or severe pain. This pattern of prescription suggests a tiered approach to pain management in dental practice, with treatment escalation based on procedure type and patient needs.

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DECLARATIONS

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Conflict of Interest: None declared.

Ethical Approval: This study was approved by the Independent Ethics Committee.

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