



Original Research

Pain management in pediatric pulpectomy: A retrospective analysis of analgesic prescriptions for 6 to 12-year-old children

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ABSTRACT

Background: Pain is a common sign that follows the majority of pulpectomy treatments. NSAIDs (non-steroidal anti-inflammatory medications) are among the analgesics used most frequently to treat pain. They give long-lasting analgesia with a brief onset. Furthermore, it is advised to finish endodontic procedures in a single visit because this lowers the likelihood of leakage through the temporary cement and flare-up rates.

Aim: To evaluate the most often recommended analgesics for children aged 6 to 12 following a pulpectomy procedure

Materials and Methods: A total of 1066 patient records, ranging in age from 6 to 12 years, undergoing pulpectomy procedures were gathered from the OPD data of a Private Dental College and were entered into an excel spreadsheet. The data was assessed based on the patient's age and gender using SPSS software for the analysis, and results were formulated

Result: Of the 1066 records evaluated, it was noted that dentists preferred to prescribe Ibugesic Plus to 20.20% of children under the age of six. 37.50% of children in the age of 6 years got a single-visit primary pulpectomy procedure. Furthermore, 30.34% of the girls took Ibugesic Plus, and 39.04% of the total children had a single primary pulpectomy.

Conclusion: Analgesics that are typically chosen for people in the 6–12 age range are Ibugesic Plus. Furthermore, the primary pulpectomy single-visit operation is the most commonly suggested treatment for these age groups.

Keywords: *Analgesics, Ibugesic Plus, Pulpectomy, NSAIDs*

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INTRODUCTION

Pain is defined as a painful emotional and sensory experience associated with an established or probable tissue injury by the internal association for the study of pain. One of the main causes of dental pain is pulp inflammation caused on by tooth decay or dental trauma. Children feel and interpret pain differently than adults do. Assessing pain in children can be tricky because they can express discomfort when they are not in pain or may not report pain when they are. Untreated pain increases fear and anxiety, which intensifies the experience of pain. The process of perceiving pain is intricate. Numerous earlier research investigations have looked at the connection between dental fear and anxiety (DFA) and pain. Intense pain during pulp therapy can be upsetting for the kid, parents, and dentists. Sometimes systemic analgesic treatment is required in addition to local anesthetic delivery to assist reduce pain. These analgesics can be given in conjunction with a dental procedure that the kid may find painful, either before or after the procedure

When used with local anesthetics, systemic analgesic medications can effectively reduce pain, particularly in teeth that have inflamed tissues. This theory was supported by multiple adult investigations. Pain and edema are among the most frequent issues that individuals with pulpectomy treatments face. Any type of surgical trauma sustained during the procedure is the cause of these issues.¹ In addition to restoring the tooth's functional integrity, oral health care professionals' first and most important duty is to alleviate pain. The most common techniques involve the use of analgesics, such as NSAIDs (non-steroidal anti-inflammatory medicines). Many studies have supported the use of NSAIDs in various pulpectomy procedures because they have a shorter onset and longer duration of analgesia.² Numerous studies have demonstrated the significant negative effects of NSAID therapy, including a high rate of morbidity and mortality.

When used with local anesthetics, systemic analgesic medications can have a synergistic effect on pain relief, particularly in teeth that have irreversible pulpitis. In certain situations, particularly during pulp excavation, achieving adequate dental anesthetic may be challenging due to irreversible pulpitis in the primary dentition, which can result in spontaneous pain. Although systemic analgesics are effective in the treatment of adult pulpitis, no research has evaluated the effectiveness of these medications following pulpectomy in children with irreversible pulpitis, although pulp therapy is a common and uncomfortable procedure for kids.

Carefully evaluating the patient's risk factors and then putting preventive measures in place can help avoid the majority of these adverse consequences.³ Nonsteroidal anti-inflammatory medications (NSAIDs) decrease pain and edema by preventing prostaglandin synthesis and reducing the activity of the cyclooxygenase [COX-1 and COX-2] enzyme.⁴ By blocking cyclo-oxygenase, they have analgesic and anti-inflammatory effects by lowering the production of arachidonic acid metabolites like prostaglandins and thromboxanes.⁵

Dental caries and trauma are two of the most common aetiological factors that result in pulpal involvement and invasive endodontic treatments.⁶ The ideal number of visits needed to finish root canal therapy was several. On the other hand, using intracanal drugs in between treatments reduces or eliminates germs within the root canal system.⁷ Endodontic operations are increasingly being completed in a single visit because it reduces the likelihood of intra-appointment leakage through temporary cement, minimizes the need for several dental appointments and operational procedures, and lessens the frequency of flare-ups.

The study's objective is to evaluate the most often prescribed analgesics for children aged 6 to 12 following a pulpectomy treatment that may require one or more visits.

MATERIALS & METHODS:

Inclusion criteria:

- Children underwent class 2 restoration in primary molars with recurrent night pain
- Healthy cooperative kids, regardless of gender, ethnicity, or socioeconomic background, between the ages of 6 and 12 who had at least one carious primary tooth that had undergone pulpectomy
- Clinical and radiological evidence of primary teeth with nonvital pulps and apical periodontitis with sufficient coronal tooth structure.
- Complete data records of patients available in the OPD data-retrieving system

Exclusion criteria:

- Carious teeth without pulpal involvement
- Congenital defects
- Previously restored teeth with any pain or swelling
- Teeth with pain indicated for extraction

Sample preparation

This retrospective analysis was conducted in a private dental facility in Chennai with a single center. The dental hospital management system (DIAS) provided the data between 2016 to 2022. 1066 specifics about kids between the ages of 6 and 12 who specifically had pulpectomy surgery were gathered. The Institutional Review Board granted ethical clearance for this investigation.

The demographic included in the statistics was diverse, with the majority being South Indian males and girls. Every case sheet was examined, and a second examiner double-checked it. Age and gender are independent variables, while analgesics and the number of pulpectomy visits are dependent variables. SPSS program Version 19 was used to analyze the data. Chi-square tests and descriptive statistics were run. A p-value of less than 0.05 was regarded as statistically significant.

Statistical analysis

Data was expressed as Mean \pm Standard deviation, Chi square test was done to assess the significance of the age and gender-wise difference. P Value $<$ 0.05 was considered to be statistically significant at a 95% confidence interval. SPSS®24 (IBM Corp. NY, USA) and MS Excel® (Microsoft Corp. USA) were used for calculation purposes.

RESULTS

Out of the 1066 records gathered, it was shown that 20.20% of 6-year-olds took Ibugesic Plus in comparison to other analgesics such as P125, P250, and Ibuclin Jr (As shown in figure 1).

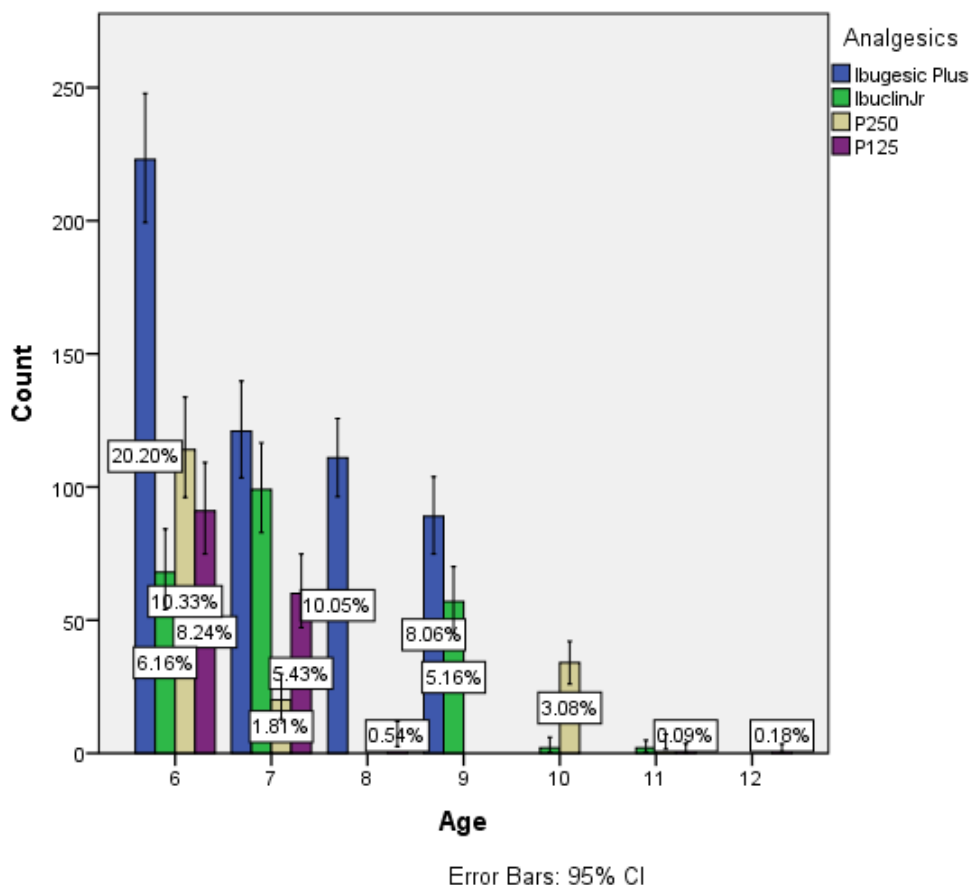


Figure 1 shows a bar graph that shows the relationship between the number of analgesics taken and the patients' ages, which range from 6 to 12 years after the initial pulpectomy treatment that was completed in one or more visits. The age distribution of patients using analgesics is represented by the X axis, while the Y axis shows the total number of patients using analgesics following therapy. Ibugesic Plus is represented by blue, Ibuclin Jr. by green, P250 by yellow, and P125 by purple. Twenty-two percent of six-year-olds took Ibugesic Plus. After the initial pulpectomy treatment, the majority of patients were prescribed Ibugesic Plus instead of other analgesics like Ibuclin Jr, P125, and P250. After doing a chi-square test, it was shown that the correlation was statistically significant. P-value: 0.00(<0.05). Hence it is statistically significant, proving that there was an association with age and the prescribed medications after the primary pulpectomy procedure.

It has been demonstrated in recent research that selective COX-2 inhibitors, when used as analgesics, are more effective than traditional NSAIDs and have higher cardiovascular and gastrointestinal adverse effects (30). According to Tripathi K D, the strength and dosage of dexamethasone during the first 24 hours of the combination's analgesic impact were sufficient to increase the efficacy of diclofenac K. It can be comprehended that such drugs are preferably administered preoperatively, extending the coverage up to 24

- 48 hours after the procedure. As shown in figure 2, it can be noted that 37.50% of the 6-year-old age group had done a primary pulpectomy single visit rather than multiple visits.

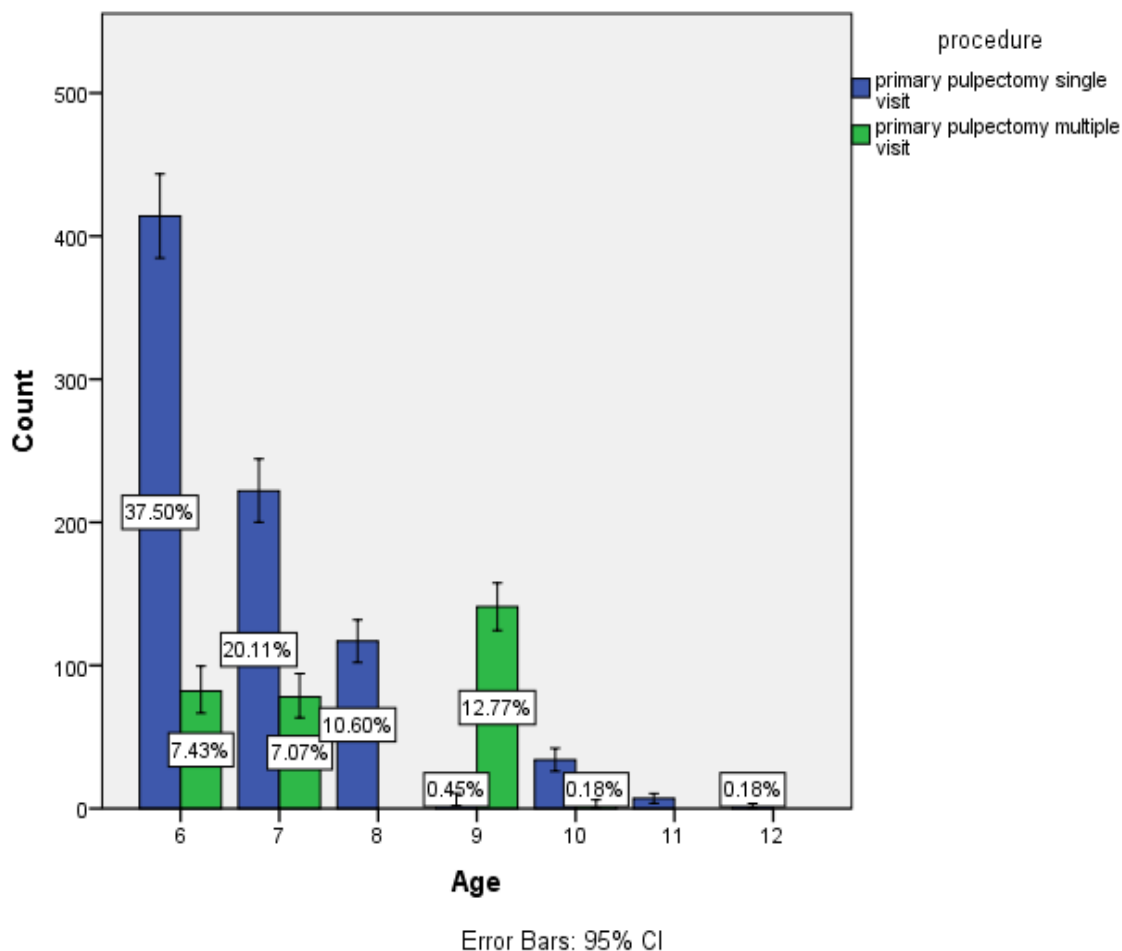


Figure 2 shows a bar graph that shows how the patients' ages are related to the main pulpectomy surgery, which can be completed in one or more visits. The patients' ages, which range from 6 to 12, are represented by the X axis, while the total number of patients who had the primary pulpectomy treatment is represented by the Y axis. "Primary pulpectomy procedure done in multiple visits" is shown by green, whereas "primary pulpectomy procedure done in single visit" is represented by blue. 7.43% of the 6-year-old age group required numerous visits for the pulpectomy surgery, compared to 37.50% who underwent primary pulpectomy in a single visit. After doing a chi-square test, it was shown that the correlation was statistically significant. P value: 0.00(<0.05)

As shown in figure 3, 39.04% of the total girls, the primary pulpectomy single visit is performed. Understanding that 30.34% of all males and just 16.12% of all girls ingested Ibugesic Plus as shown in figure 4.

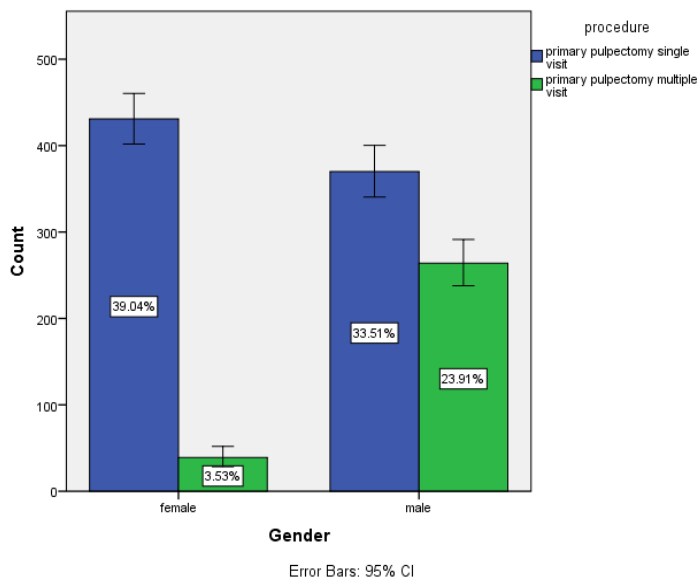


Fig. 3. A bar graph showing the relationship between the patient's gender and the main pulpectomy surgery performed throughout one or more visits. The boys and girls who had the surgery are represented by the X axis, and the total number of patients is represented by the Y axis. Primary pulpectomy procedure done in multiple visits" is shown in green, whereas "primary pulpectomy procedure done in single visit" is represented by blue. It was observed that most boys between the ages of 6 and 12 were prescribed to have primary pulpectomy procedures completed in a single visit. Furthermore, more females had primary pulpectomy procedures completed in a single visit as opposed to several trips. After doing a chi-square test, it was shown that the correlation was not statistically significant.

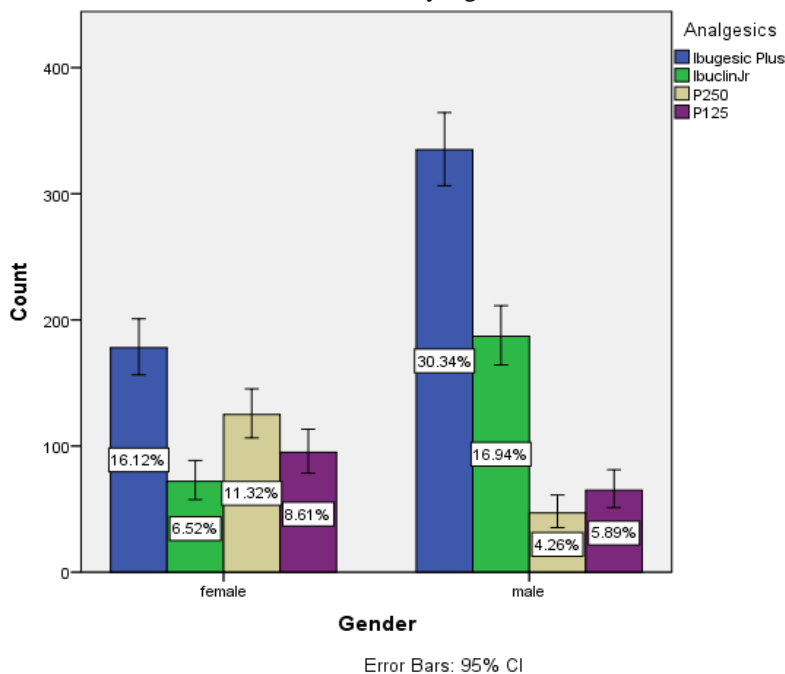


Figure 4 shows a bar graph that illustrates the relationship between the gender of patients, aged 6 to 12, and the amount of analgesics they drank. The Y axis shows the overall number of people who use analgesics, while the X axis shows the gender of the patients. Ibugesic Plus is represented by blue, Ibuclin Jr. by green, P250 by yellow, and P125 by purple. Boys were found to ingest Ibugesic Plus at a rate of 30.34% compared to girls following primary pulpectomy. After doing a chi-square test, it was shown that the correlation was not statistically significant.

DISCUSSION

Even in non-emergency situations, pain management is a crucial issue that needs to be addressed. The onset, intensity, pattern, location, and quality of pain should all be carefully evaluated (Friedberg Barry et al. 2016). In addition to taking into account the patient's psychological state, dental procedures should consider the potential degree and length of pain that the patient may experience (The assessment and management of acute pain in infants, children, and adolescents, 2001). Pharmacologic treatment and non-pharmacologic techniques are also options for managing pain.⁸ When deciding whether to delay the last necessary therapy, pharmaceutical pain management ought to be taken into account. In pain management, analgesics like ibuprofen and paracetamol have shown their worth. Because of its greater analgesic efficacy, higher therapeutic index, less toxicity in the case of an overdose, and eight hours of action, ibuprofen is recommended above paracetamol (Mahesh R et al. 2019).⁹

To manage procedure-related pain, anxiety, and distress with a low risk of side effects, non-pharmacologic interventions can be used either in isolation or in conjunction with pharmaceutical interventions (Wilson et al. 1997; Sessle 2014; Landier) as well as Tse (2010)). To improve pain management, the American Pain Society (APS) and the American Academy of Pediatrics (AAP) advise healthcare providers to create a calm and pain-free environment during procedures (Pain Management in Infants, Children, Adolescents and Individuals with Special Health Care Needs, 2018).¹⁰

One of the limitations of this study was the lack of data regarding the differential diagnosis in cases of pulp-related complications such as reversible and irreversible pulpitis. A few of the study's shortcomings include its retrospective design, which leaves room for bias in the accuracy of the data that was recorded.^{11,12} Furthermore, the study did not consider the differences in how different children perceive and report pain, which could impact the results.¹³ Further investigations utilizing more extensive sample sizes and meticulous data-gathering techniques are required to corroborate these findings and delve deeper into efficacious pain mitigation approaches.¹⁴ Based on this data the guidance for management of pain patients was developed and designed to be easily adopted even in non-specialized dental clinics to organize the decision-making process and provide the child with the optimal treatment option.¹⁵

It is recognized that children from low-income families tend to receive episodic or emergency dental care. At the same time, those from higher-income households will visit the dentist more regularly for preventive check-ups (Edelstein et al. 2002).¹⁶ However, one of the limitations of this study is that no information on socio-economic conditions was collected. Further studies should assess the socio-economic profile of patients attending dental emergency services and differences in dental service use between social classes.¹⁷

We suggest the following tactics to enhance pain management in pediatric pulpectomy based on our findings:

Standardization of Pain Management Protocols: Consistent and efficient pain management across various practices can be ensured by creating and following standardized protocols for pain management.¹⁵

Customized Pain Treatment Plans: By adjusting pain treatment techniques to each patient's unique

requirements, results and patient satisfaction can be raised.¹⁸

Education and Training: Dental practitioners' capacity to properly manage pain can be improved by providing them with continual education and training on the newest methods and protocols for pain management.¹⁹

In addition to offering complete pain relief, encouraging the use of non-pharmacological therapies can enhance the patient experience overall. Improving patient outcomes and experiences during pulpectomy requires effective pain management. This retrospective review emphasizes the importance of standardizing protocols, integrating non-pharmacological therapies, and the use of non-opioid analgesics in the management of postoperative pain. Dental professionals can improve the standard of care given to young children having pulpectomy by addressing these issues. Improving patient outcomes and experiences during pulpectomy requires effective pain management.^{20,21}

CONCLUSION

This retrospective review indicates that, among children aged 6 to 12, Ibugesic Plus is the most popular painkiller when compared to P125, P250, and Ibuclin Jr and emphasizes the importance of standardizing protocols, integrating non-pharmacological therapies, and the use of non-opioid analgesics in the management of postoperative pain. Dental professionals can improve the standard of care given to young children having pulpectomy by addressing these issues. There was no correlation found between the patient's gender and the analgesics prescribed.

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CONFLICTS OF INTEREST

There are no conflicts of interest

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