

## Various Analgesics Prescribed Following Third Molar Removal - A Retrospective Analysis On 891 Patients Over 10 Months

Research Article

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### Abstract

Pain and swelling are two of the most common problems experienced by patients who have undergone surgical removal of impacted third molars. These problems result from inflammation following on surgical trauma. The primary obligation and ultimate responsibility of oral health care providers is not only to restore function, but also to relieve pain. The aim of this study was to assess the various analgesics prescribed following third molar surgery. A retrospective study was conducted using the patient records from Saveetha Dental College, Chennai from June 2019 - April 2020. The study population included case records of patients who had undergone third molar extraction, selected by non-probability purposive sampling. Data was collected and then subjected to statistical analysis. Microsoft Excel 2016 (Microsoft office 10) data spreadsheet was used to collect data and later exported to SPSS IBM (version 20.0). Descriptive statistics and chi square test were employed with a level of significance set at  $p < 0.05$ . About 40% of patients included in this study were between 16 to 45 years of age and 60% of patients were between 45 to 70 years of age. 56.43% were males and 43.57% were females, showing that there is a higher incidence of third molar extraction in males. The proportion of various analgesics prescribed were, aceclofenac - 28.68%, diclofenac - 2.95%, ketorolac - 10.54%, paracetamol - 25.89%, paracetamol and aceclofenac combination - 31.63%, tramadol - 0.31%. The prescription of paracetamol and aceclofenac combination was higher and tramadol was the least prescribed among all the other analgesics. There was no statistically significant correlation between tooth number, age, gender and the type of analgesic prescribed ( $p > 0.05$ ).

**Keywords:** Analgesics; Extraction; Impaction; Pain; Third Molar.

### Introduction

Third molar surgery is one of the most frequently performed interventions in the field of oral and maxillofacial surgery [35]. It involves severe laceration and tissue trauma to soft and hard tissues surrounding it. It can be very traumatising for the patients and postoperative pain management is a vital issue [36]. Although inflammatory response is good for healing but an exacerbated response can cause all of the above mentioned complications. To overcome these complications, clinicians mostly prescribe analgesics [7].

During surgery, tissue damage, inflammation and other noxious stimuli can trigger a range of changes in the peripheral nervous system [8]. It has been well documented that non steroidal anti-inflammatory drugs (NSAIDs) are effective in relieving postoperative pain [9]. The NSAIDs affect the site of injury by acting peripherally and administration of NSAIDs reduces this tissue damage. The NSAIDs inhibit the production of arachidonic acid metabolites such as prostaglandins and thromboxanes, which mediate the inflammatory process. These metabolites are produced locally at the site of cell injury and as such do not migrate to

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distant sites. In addition, NSAIDs alter peripheral nociceptors by reducing the local concentration of these allogeic chemicals, which are activated by peripheral tissue injury [13].

Postoperative pain and swelling are usually controlled by administering drugs to patients before and after surgery in order to decrease the natural inflammatory response [33]. However, nonselective NSAIDs are associated with increased surgical bleeding and important gastrointestinal (GI) effects, including ulceration [15]. Cyclooxygenase-2 (COX-2) selective inhibitors effectively treat pain and inflammation in both acute and chronic conditions, while presenting a minimal inhibitory effect on COX-1 at full therapeutic doses. Because of this selective inhibition, side effects are minimal. On the other hand, higher costs might decrease its use [15]. Complications of extraction such as dry socket can be treated with ZOE paste [12]. In another study, Irrespective of the year of study, the majority of the students showed a negative attitude toward HIV/AIDS patients and only a few among the interns showed a positive approach toward treating HIV patients [19].

The effectiveness of various analgesics that have been prescribed to relieve post operative pain after third molar surgery has been studied in previous literature [26, 27, 5]. In another study, ketorolac 10 mg is more effective than paracetamol 500mg as an analgesic after dental extractions [32, 21]. Oropharyngeal airway volume has shown the highest post-surgical reduction though statistically insignificant [10, 6].

Various significant studies have been performed by our team with regards to the current trends in literature. They include emphasizing the importance of training regarding biomedical waste management (BMW) as the lack of proper and complete knowledge [30] about management impacts practices of appropriate waste disposal [19]. A standard protocol regarding the training as well as preventive measures for IE should be formulated for the dental students and the knowledge acquired must be transferred into practice [20]. The etiology and pattern of maxillofacial injuries reflect the trauma patterns within the community and can thus provide a guide to help design programs toward prevention and treatment [2, 1, 28]. In another study, buccal fat pad graft proved to give better results as the interposition material as it has good patient acceptance, rapid epithelization, minimal donor site morbidity and minimal intra and postoperative complications [29, 17]. The ability to use Botox as an adjuvant and primary mode of the treatment for various maxillofacial disorders offers exciting treatment options for dentists and patients in the future [16, 22].

Currently the focus is on epidemiological retrospective studies. The aim of this study was to assess the various analgesics prescribed following third molar surgery.

## Materials and Methods

### Study design and setting

This pilot retrospective study examined the case records of 891 patients, 574 males and 320 females who underwent treatment from June 2019 - April 2020 at a private dental college in Chennai. Ethical approval was obtained from the Institutional Ethics Committee of the University (SDC/SIHEC/2020/DIASDA-

TA/0619-0320). The study population included patients who had undergone third molar extraction, selected by non-probability purposive sampling. Pediatric patients, completely edentulous patients and denture wearers were excluded from the study.

### Data collection

Case records of patients who had undergone third molar extraction were reviewed and analysed. Relevant data such as patient age, sex, tooth no., analgesic prescribe were recorded. Repeated patient records and incomplete records were excluded. The final dataset consisted of 645 patients of Indian origin who had undergone third molar surgery. Data was verified by an external reviewer.

### Statistical analysis

Data was recorded in Microsoft Excel 2016 (Microsoft office 10) and later exported to the Statistical Package for Social Science (SPSS IBM version 20.0) and subjected to statistical analysis. Descriptive statistics and chi square test were employed with a level of significance set at  $p < 0.05$ .

## Results And Discussion

The study population was grouped based on their age as follows: 16 to 45 years - 40%, 45 to 70 years - 60%. [Figure 1]. About 56.43% were males and 43.57% were females, showing that there is a higher incidence of third molar extraction in males [Figure 2]. The proportion of various analgesics prescribed were, aceclofenac - 28.68%, diclofenac - 2.95%, ketorolac - 10.54%, paracetamol - 25.89%, paracetamol and aceclofenac combination - 31.63%, tramadol - 0.31% [Figure 3].

Paracetamol was the most commonly analgesic prescribed after extraction of 18 (2.64%). Paracetamol + Aceclofenac combination was highly prescribed following extraction of 28 (1.86%), 38 (15.81%) and 48 (12.56%). However, chi square test showed that there was no significant association ( $p > 0.05$ ) [Figure 4].

Among patients between 16 to 45 years, aceclofenac was prescribed to 11.45%, diclofenac was prescribed to 0.93%, ketorolac was prescribed to 5.58%, paracetamol was prescribed to 8.99%, paracetamol + aceclofenac was prescribed to 12.71% and tramadol was prescribed 0.31% of the patients. Among patients between 45 to 70 years, aceclofenac was prescribed to 17.21%, diclofenac was prescribed to 2.02%, ketorolac was prescribed to 4.95%, paracetamol was prescribed to 16.9% and paracetamol + aceclofenac was prescribed to 18.91% of the patients. Chi square test showed that there was no significant association between age and the prescription of various analgesics following third molar extraction ( $p > 0.05$ ). Thus, the most commonly prescribed analgesic was paracetamol + aceclofenac combination in patients aged between 16 to 45 years and also in patients aged 45 to 70 years, followed by aceclofenac, paracetamol, ketorolac, diclofenac and tramadol [Figure 5].

In females, aceclofenac was prescribed to 12.87%, diclofenac was prescribed to 1.71%, ketorolac was prescribed to 5.74%, paracetamol was prescribed to 8.99% and paracetamol + aceclofenac was prescribed to 14.26% of the patients. Among males, aceclofenac

Figure 1. Bar graph representing the age distribution of patients. X axis represents the age of patients and Y axis represents the percentage of patients included in this study. About 40% of patients included in this study were between 16 to 45 years of age and 60% of patients were between 45 to 70 years of age.

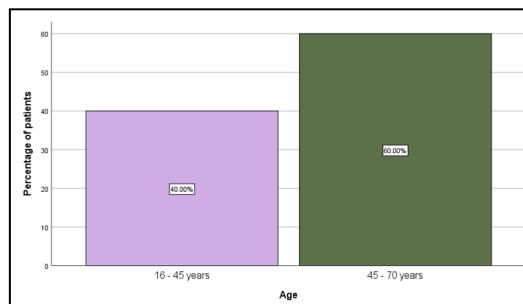


Figure 2. Bar graph representing the Gender distribution of patients. X axis represents the gender and Y axis represents the percentage of patients included in this study. About 56.43% were males and 43.57% were females.

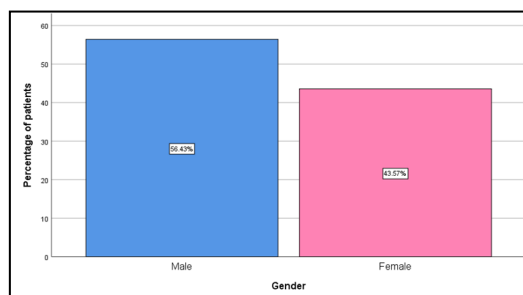


Figure 3. Bar graph representing the various analgesics prescribed to patients following third molar extraction. X axis depicts the analgesics prescribed and Y axis depicts the percentage of patients included in this study. Paracetamol + Aceclofenac combination was prescribed to the majority of the patients.

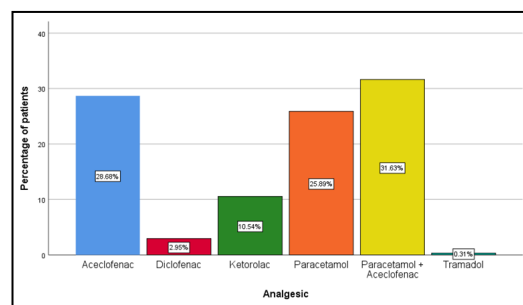
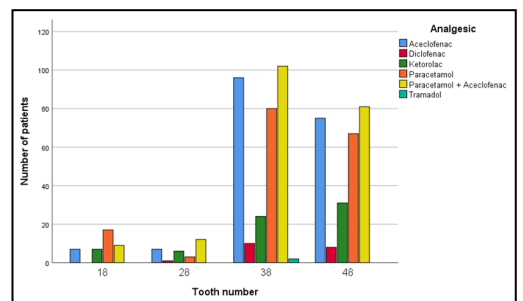


Figure 4. Bar graph representing the association between tooth number and the prescription of various analgesics following third molar extraction. X axis represents the tooth number and Y axis represents the number of patients included in this study. Chi square test showed that there was no significant association. Pearson Chi square value = 22.353; p-value = 0.099 (p>0.05, \*statistically insignificant). Thus, among the various analgesics, paracetamol and paracetamol + aceclofenac combination was the most prescribed.



was prescribed to 15.81%, diclofenac was prescribed to 1.24%, ketorolac was prescribed to 4.81%, paracetamol was prescribed to 16.9%, paracetamol + aceclofenac was prescribed to 7.36% and tramadol was prescribed to 0.31% of the patients. Chi square test showed that there was no significant association between gender and the prescription of various analgesics following third molar extraction (p>0.05). Thus, the most commonly prescribed analgesic was paracetamol + aceclofenac combination in females,

followed by aceclofenac, paracetamol, ketorolac and diclofenac. In males, paracetamol was commonly prescribed, followed by aceclofenac, paracetamol + aceclofenac combination, ketorolac, diclofenac and tramadol [Figure 6].

In this study, there is a male predilection in the number of patients who underwent third molar extraction. This is similar to a study on Saudi Arabian population by Manoj Kumar et al, which

Figure 5. Bar graph representing the association between age and the prescription of various analgesics following third molar extraction. X axis represents the age of patients and Y axis represents the number of patients included in this study. The most commonly prescribed analgesic was paracetamol+aceclofenac combination in both age groups. However, Chi square test showed that there was no significant association. Pearson Chi square value = 10.242; p-value = 0.069 ( $p > 0.05$ , \*statistically insignificant).

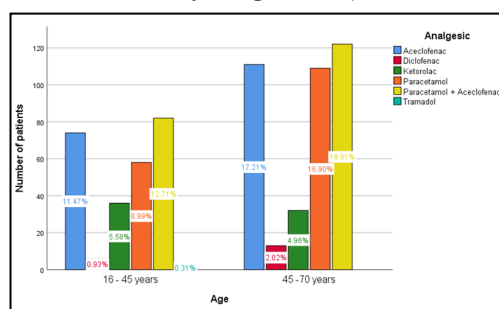
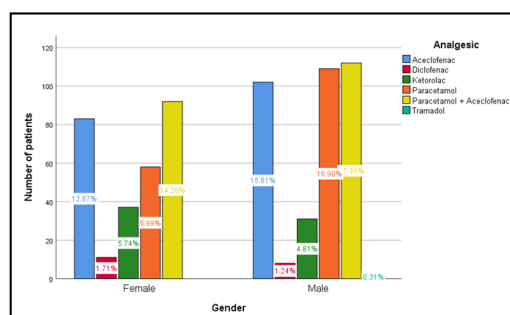


Figure 6. Bar graph representing the association between gender and the prescription of various analgesics following third molar extraction. X axis represents the gender of patients and Y axis represents the number of patients included in this study. The most commonly prescribed analgesic was paracetamol + aceclofenac combination in females. In males, paracetamol was commonly prescribed. However there was no significant association. Pearson Chi square value = 12.008; p-value = 0.078 ( $p > 0.05$ , \*statistically insignificant).



showed a significant difference between males (65%) and females (35%) with impacted third molars [18]. There was a male preponderance in the prevalence of third molar impaction in a study Je et al [11]. A study by Bataineh AB et al concluded that 57.7% of male patients and 42.3% of female patients had undergone third molar extraction, showing a higher incidence of third molar removal in males [4].

In contrast to this study, there is a higher prevalence of third molar impaction among females when compared to males in a study by Quek S.L [31].

There is a higher prevalence of third molar extraction in the age group of 20-35 years in the current study. A study by Kautto A et al, showed significant differences in surgical extractions were more common than routine extractions ( $P < 0.001$ ) below the age of 40 years [24, 14]. The mean age of patients undergoing third molar extractions is 24.41 with a standard deviation of 6.12 years in a study by Obiechina AE et al [25]. There were no contradictory findings in other literature.

In the present study, the prescription of paracetamol and aceclofenac combination is higher and tramadol being the least prescribed among all the other analgesics. A study by Shigeru Maeda et al, concluded that flurbiprofen was the main analgesic used for extraction of wisdom teeth under general anesthesia in patients [21]. A recent study has demonstrated that Tramadol was found to be more effective postoperatively than preoperatively [23]. Bamgbose BL et al described that the analgesic effect, potency and dosage of dexamethasone within the first 24 hrs adequate

to enhance the efficacy of diclofenac K in dexamethasone and diclofenac combination [3].

There was no statistically significant correlation between tooth number, age, gender and the type of analgesic prescribed in this study.

Even though a few studies were contradictory in regard to gender prevalence, the overall consensus was in agreement with the results of this study.

The results of this study have to be interpreted with the geographic limitation of the study population and the sample size selected. Hence it cannot be generalized to other adult populations of geographic and cultural variation.

## Conclusion

Within the limits of this study, the prescription of paracetamol and aceclofenac combination was higher and tramadol was the least prescribed among all the other analgesics. There was no statistically significant correlation between tooth number, age, gender and the type of analgesic prescribed. Analgesics produce significant pain relief and improve the quality of a patient's life in the immediate postoperative period. Proper prescribing practices as well as physician and patient education can help manage tolerance issues, adverse events, as well as common and uncommon side effects.



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