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Commonly prescribed analgesics, post implant surgery - A retrospective study

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ABSTRACT

Postoperative pain management comes with any treatment done in dentistry. Pain is considered as a complex experience that's invoked by an external stimulus. Safe and reliable methods of managing acute dental pain can be done with the administration analgesics. Common analgesics include Diclofenac sodium, Ketrolac, Tramadol, Paracetamol, etc. Dental implants are biologically and restoratively driven. A retrospective study was done in an institutional setting. The data for the study were retrieved from the college's patient record management software. All patients who underwent implant surgery at a given time frame of June 2019 - March 2020 were taken into consideration. The patients PID, Name, Age, Gender and Analgesic prescribed were retrieved and tabulated. The data was then analysed using software (SPSS). Results: A total of 592 patients were involved in this study, 351 being male patients and 241 female patients. Majority of the patients who participated in this study were between 39.9 $\pm$ 12.58 years of age. The commonly prescribed analgesics included: Aceclofenac Paracetamol + Serratiopeptidase (93.2%), Acetaminophen + Hydrocodone (5.2%) and Piroxicam (20mg) (1.5%). Piroxicam was prescribed the least in the age group of 17-30 years. Conclusion: The most prescribed analgesic for patients who had undergone implant surgery was a combination of Aceclofenac, Paracetamol and Serratiopeptidase.

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INTRODUCTION

Effective pain management is of utmost importance in any invasive treatment. It has significant psychological benefits to the patients. The goal is to eliminate or reduce the pain and discomfort with minimum side effects. Pain is considered as a complex experience that is invoked by an external stimulus. It is usually experienced in case of trauma (Abhinav *et al.*, 2019a) surgeries, dental or medical procedures, diseases, etc. It is inevitable, especially in procedures that are invasive. It is an unfortunate consequence of tissue damage that is caused by a sur-

gical procedure or inflammation. Poorly managed pain could lead to discomfort and prolonged rehabilitation (Garimella and Cellini, 2013). Anxiety during treatment could also cause pain. It is said that anxiety is a predictor of pain (Kumar, 2017). So it is always important to control the patient's anxiety by reassuring them during the entire course of the treatment.

A safe and reliable means of providing relief from pain would be to prescribe analgesics. They are commonly known as "painkillers". They are substances that work in different ways to relieve different types of pain experienced in the body. Preemptive analgesia is also a popular method of providing pain relief. They are also known as preoperative analgesics. They prevent the production of mediators that are responsible for nervous stimulation. These forms of pain management are used for acute dental pain, as in the case of dental extractions (Thenarasu *et al.*, 2018). Analgesics are classified into opioid and non-opioid drugs (Becker, 2010). Non-opioid analgesics include Acetaminophen and Non- Steroidal Anti-inflammatory Drugs (NSAIDs). They provide a low incidence of side effects and have lesser chances of substance abuse, at conventional dosage for the treatment of acute dental pain (Forbes *et al.*, 1989).

Few of the most common analgesics prescribed for acute dental pain include Diclofenac sodium, Ketorolac, Tramadol, Paracetamol, etc. The most frequent side effect could be related to gastrointestinal toxicity and is contraindicated in patients who have nephropathy, erosive or ulcerative conditions of GI mucosa, anticoagulant therapy, allergies, nausea, vomiting, etc. A minimum of 3 days post-operative pain is normal in any surgical procedure. Pain and discomfort during the healing phase are also sometimes common (Patil *et al.*, 2017).

Dental implants are surgical fixtures or artificial tooth roots that are placed into the jaw bone. In present times, where tooth loss has become one of the most reported complaints by patients, dental implants have become a popular choice of treatment (Hong and Oh, 2017; Patturaja and Pradeep, 2016). It has been used as a gold standard for the replacement of missing teeth (Rasidi, 2016). They are safe and reliable, as its long term prognosis is good. Proper instrumentation and a clean surgical site are of utmost importance in every dental treatment. To ensure a good prognosis.

Comprehensive rehabilitation in diseases such as Periodontitis, where there is tooth loss due to bone loss and weak periodontal attachment, dental implants can be placed after proper treatment planning (Ramesh *et al.*, 2017). As dental implant procedure is an invasive one, post-operative pain is one of the few complications that will occur. The patient must be well aware and informed about it prior to the surgery. Dental implants are a comprehensive treatment that would require proper history taking, diagnosis and treatment planning to ensure its success. The technique used for the placement and treatment is also important factors that affect the prognosis. A multidisciplinary approach must be taken while planning. Dentists prescribe appropriate analgesics that would help in reducing the pain and discomfort for the patient (Fukuda *et al.*, 2012). Persistent severe pain after three days of dental implant placement would likely be due to infections or damage to the nerve while placement (Delcanho and Moncada, 2014).

Previous studies had been conducted by our team which include clinical trials (Vidhya and Nesappan, 2016; Ashok *et al.*, 2014), in vitro studies (Nesappan and Ariga, 2014; Abhinav *et al.*, 2019b), surveys, reviews (Gupta *et al.*, 2010; Abhinav *et al.*, 2019b), pilot studies (Anbu *et al.*, 2019) and Randomised Control Trials (Venugopalan *et al.*, 2014; Balaji and Gajendran, 2018). The present study is a retrospective study that aims to assess the most commonly prescribed analgesic in a teaching institution, post implant surgery. This study will provide knowledge regarding the dentist's awareness on the best drug of choice to reduce post-operative pain (Janani and Gajendran, 2018; Madhavan and Gajnedran, 2018).

MATERIALS AND METHODS

A retrospective study was conducted in the department of Implantology at Saveetha Dental College and Hospital, Chennai, South India. Ethical approval was obtained from the Institutional Ethical Committee-SDC/SIHEC/2020/DIASDATA/0619-0320. The study included all the participants who had undergone implant placement between June 2019 to March 2020. The digital case sheets of the patients were analyzed and the data was retrieved (Wahab *et al.*, 2017; Pandurangan *et al.*, 2020). Patients with missing data were excluded from the study. The variables recorded were age, gender and type of analgesic prescribed. The patients were grouped into three age ranges:17-30 years, 31-50 years and 51 years and above (Ganapathy *et al.*, 2017; Kannan and Venugopalan, 2018). Cross verification of the data was done by the second reviewer to avoid any missing or repetitive data.

Statistical analysis

Data were analyzed using SPSS software (IBM SPSS Statistics, Version 24.0, Armonk, NY: IBM Corp).

Descriptive statistics were used for the data summarization. Association between age and gender and analgesic was seen for using the chi-square test. P value <0.005 was considered to be statistically significant.

RESULTS AND DISCUSSION

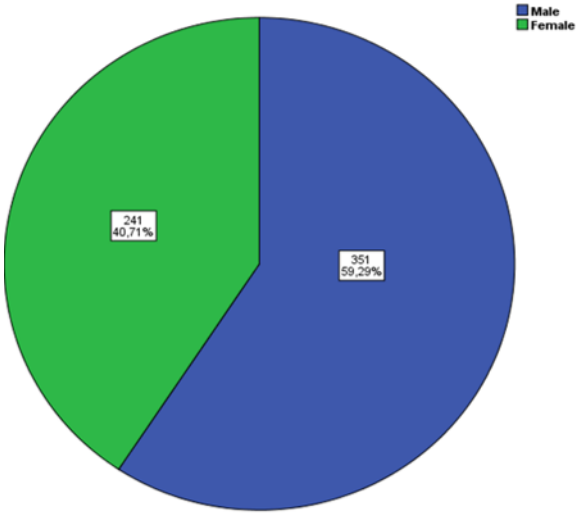

Figure 1: Pie chart represents the gender distribution in patients who have undergone dental implant treatment

Age, Gender and Analgesic prescribed distribution in the study

A total of 592 patients details were included in this study, out of which 351 were male and 241 were female patients (as seen in Figure 1). They were categorized into three groups based on their age and they were: 17-30 years (170 patients), 31-50 years (300 patients), 51 years and above (122 patients). More number of patients were seen in between the age of 31-50 years, which is statistically significant (p-value =0.000). The distribution of age and gender is seen in Table 1. The highest percentage of patients were seen within the age group of 31-50 years. (Chi-square test,p value=0.000).

There were 3 analgesics that were commonly prescribed post implant surgery in this study and they were: combinations of Aceclofenac, Paracetamol, Serratiopeptidase; Acetaminophen (650mg) and Hydrocodone and Piroxicam (20mg). Out of the three analgesics, the combination of Aceclofenac, Paracetamol, Serratiopeptidase was prescribed most frequently to patients, 93.2% (552 patients) were prescribed with it. 31 patients (5.2 %) were prescribed the combination of Acetaminophen (650ml), Hydrocodone and 9 patients (1.5%) were prescribed Piroxicam (20mg). The results are seen in Figure 2 . X-axis represents the three analgesics prescribed; Y-axis, the number of patients in each category. The number of patients prescribed with the Aceclofenac, Paracetamol and Serratiopeptidase (blue- 93.2%) was more than that of Acetaminophen (650mg), Hydrocodone (green-5.2%), and Piroxicam (20mg) (grey-1.5%).

Age and analgesics prescribed

The most commonly prescribed analgesic was a combination of Aceclofenac, Paracetamol, Serratiopeptidase (552 patients). Acetaminophen (650mg), Hydrocodone was prescribed most in the 31-50 age group (14 patients) and least in the 17-30 age group (8 patients). Piroxicam was prescribed the least. 5 patients were prescribed with it for the age group of 51 years and above and 1 patient within the age groups of 17-30 years. There was no statistically significant difference between age and the analgesic prescribed. (Chi-square test,df=4,p value=0.073)(Figure 3). X-axis represents the 3 age groups; Y-axis represents the number of patients in each category. The combination of Aceclofenac, Paracetamol and Serratiopeptidase was the most preferred analgesic to be prescribed within all age groups, and Piroxican (20mg) was the least preferred. Chi square test; P value - 0.073 (p> 0.05 (Not significant))

Gender and Analgesics prescribed

There were more patients who were male. The commonly prescribed analgesic for both male and female patients was a combination of Aceclofenac, Paracetamol, Serratiopeptidase (male- 55%, female- 38%), Piroxicam (20mg) was prescribed the least in both males and females (males- 1%, females- 1%). (Chi-square test, df=2, p value= 0.949) (Figure 4). X-axis represents the gender; Y-axis represents the number of patients in each category. The combination of Aceclofenac, Paracetamol and Serratiopeptidase was the most preferred analgesic to be prescribed for both genders, and Piroxican (20mg) was the least preferred. Chi square test; P value - 0.949 (> 0.05 (Not significant)).

From the results seen in the present study, there were significantly more patients with missing teeth in the age groups of 31-50 years. Male patients were also higher in number. The most commonly prescribed analgesic was seen to be a combination of Aceclofenac Paracetamol and Serratiopeptidase by the dentists. Proper prescription of analgesics is important as it reduces post operative pain and discomfort for the patient.

Dental implants and its use in replacing missing teeth has become one of the largest advances in dentistry in the last few decades. It restores nor-

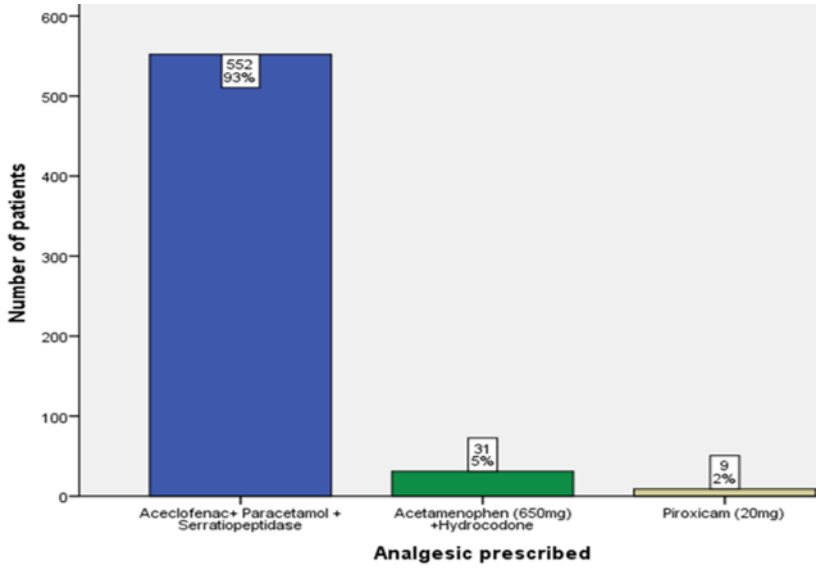

Figure 2: Bar graph represents the commonly prescribed analgesics

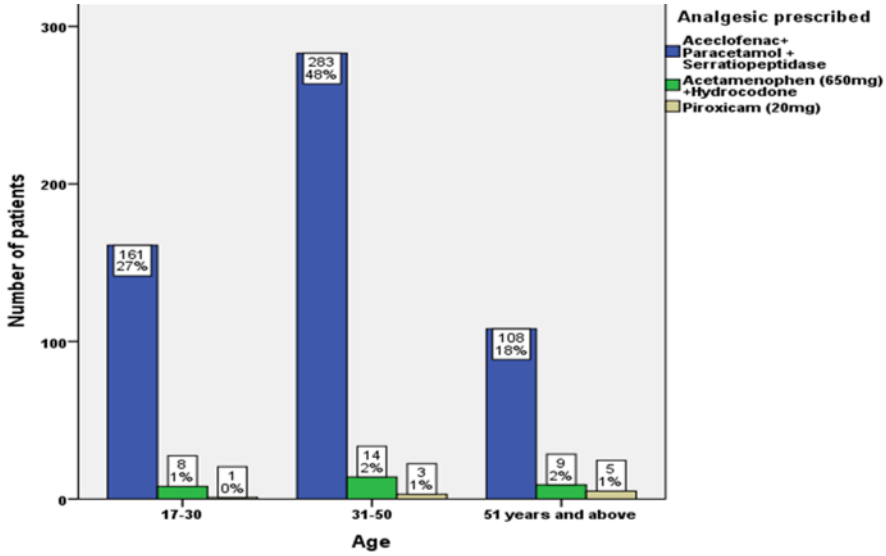

Figure 3: Bar graph represents the association between age and Analgesic prescribed.

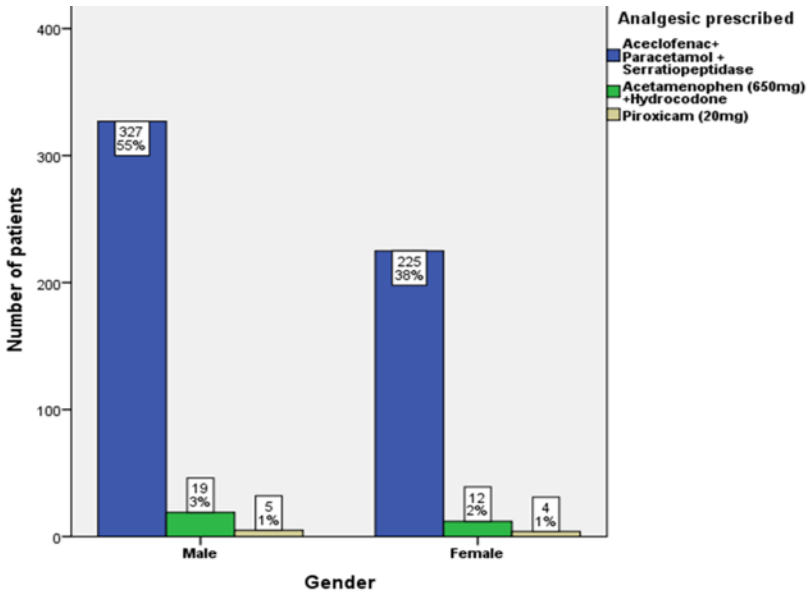

Figure 4: Bar chart shows the association between gender and Analgesics prescribed

Table 1: The age and gender distribution (percentage) in the study

Gender	Age (n=592)			Chi-square value	P-value
	17-30 Years	31-50 Years	51 years and above		
Male (%)	33.9	40.2	25.9	38.685	.000*
Female (%)	21.2	66	12.9		
Total (%)	28.7	50.7	20.6		

mal contour, function, esthetics, comfort, speech and health (Rao and Bhat, 2015). Zirconia implants have been considered for their aesthetics, lack of galvanic reactions and their lesser risks for inflammation as compared to titanium implants (Ahmed *et al.*, 2017). With any invasive procedure, post operative pain is inevitable. There have been studies that state that patients experience different levels of pain post-treatment. Mean pain scores were stated to be the highest 24 hours after the procedure was done (Al-Khabbaz *et al.*, 2007; Rao and Bhat, 2015). Controlling and reducing this pain is one of the most important aspects of post operative management to ensure that fewer chances of complications arise.

It is a known fact that males are more active and indulge in more risk-taking things that could lead to trauma, compared to females. So, it would only make sense if they were more prone to tooth loss in comparison as well. In the present study, the number of male patients who had undergone implant treatment was higher in comparison to females. The number of males in the study was seen to be 351 and females were 241. A cross-sectional study conducted in Andhra Pradesh had stated that 64.29% of the males in their study had missing teeth (Begum *et al.*, 2016). Females are more conscious about their appearance and also psychosis of losing teeth as a sign of aging will lead to them maintaining good oral hygiene and so fewer cases with edentulous areas.

Tooth loss could be due to multiple reasons: caries, gingival health, trauma, etc. many of these issues affect the older age groups. In the present study, dental implants were placed mostly on patients who were within the age group of 31-50 years. A cross-sectional study by Chandrasekhar *et al.* (2013) stated that the odds of tooth loss in older patients were 1.2 times higher than in youngsters.

In the present study, the three main analgesics that were taken into consideration were combinations of Aceclofenac, Paracetamol, Serratiopeptidase, Acetaminophen, Hydrocodone and Piroxicam (20mg). The most commonly prescribed was the combination of Aceclofenac, Paracetamol, Serratiopeptidase (93.2%) and the least prescribed was Piroxicam (20mg) (1.5%). There have been studies that survey analgesics preference. One such study states that a combination of Ibuprofen with Paracetamol was most common, followed by diclofenac for post-implant pain management (Datta *et al.*, 2015). NSAIDs such as Ketorolac has been proved to provide better analgesic effects when compared to Paracetamol for dental pain main management. Studies have shown the better efficacy of pain management in patients who were prescribed Ketorolac when undergoing dental treatments (Rao and Kumar, 2018). Along with analgesics, a prescription of an antibiotic is commonly done as well to ensure no postoperative infection occurs (Kumar and Sneha, 2016; Abhinav *et al.*, 2019a; Kumar *et al.*, 2015).

Pain threshold is different for each individual. typically, older people perceive as being more sensitive to pain than youngsters (Scipio *et al.*, 2011). In the present study, the combination of Aceclofenac, Paracetamol, Serratiopeptidase was prescribed mostly for age groups of 31-50, 51 years and above. In a study conducted in a teaching hospital, the age was taken into consideration while prescribing analgesics. It was seen in the study that the patients who received the analgesic drugs were mostly seen in 41 years and above (Menezes *et al.*, 2016).

Study limitations

The study had a small sample size with an unequal number of males and females. There was also an unequal distribution of patients within the age groups. The study was limited to a specific locality and cannot be generalised to a wider population. There was no follow-up data to check for the efficacy of the analgesic.

Future scope

Future studies can involve the pain assessment scale, which can help us evaluate the patient's pain pre and post-consumption of the analgesic. It can also include the dosage which the patient intakes.

An increase in the sample size and area of study can also be suggested.

CONCLUSION

Within the limits of the study, a combination of Aceclofenac, Paracetamol and Serratiopeptidase was the preferred choice of analgesic to prescribe to patients after implant surgery.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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