

# Analgesic efficacy of ibuprofen compared to paracetamol in the management of post-extraction pain

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## ABSTRACT

**Aim:** The purpose of this study is to compare the efficacy of ibuprofen and paracetamol in the treatment of post-extractive dental pain. **Objective:** The objective of this study was to segregate post-extraction patients into two groups where one group will be prescribed paracetamol and the other group with ibuprofen. **Materials and Methods:** Patients reporting to Saveetha Dental College and Hospital with the chief complaint of pain and advised extraction were included in the study. Each participant was given a brief explanation of the study, and an informed consent was obtained from each participant before inclusion in the study. The extraction of the tooth was done, and the drug paracetamol was administered to half of the patients and the drug ibuprofen to the remaining patients. **Result:** The result of the study showed that patients taking ibuprofen had less dental pain compared to the patients on paracetamol. Ibuprofen scored 91.4% compared to 83% of paracetamol in Score 0. Ibuprofen scored 85.6% compared to 69% of paracetamol in Score 1. In Score 2, ibuprofen was 66.6% and paracetamol 52.4%. In Score 3, ibuprofen got 60% and 44.6% for paracetamol. **Conclusion:** From the result of this study, it is clearly evident that a patient who received ibuprofen had less dental pain when compared with a patient who received paracetamol. This will help clinicians in prescribing medication after dental extraction.

**KEY WORDS:** Analgesics, Ibuprofen, Paracetamol, Post-extraction pain

## INTRODUCTION

Ibuprofen is a nonsteroidal anti-inflammatory drug (NSAID) which is used to relieve post-operative pain.<sup>[1]</sup> Like other NSAIDs, mechanism of action is by inhibition of the cyclooxygenase enzyme, resulting in reduced prostaglandin synthesis, which is responsible for pain and inflammation.<sup>[2]</sup> Ibuprofen also inhibits thromboxane synthesis in platelets and thus inhibits the secondary phase of platelet aggregation.<sup>[3]</sup> Since platelets can be involved in the inflammatory process, this action may contribute to the efficacy of ibuprofen.<sup>[4]</sup>

Ibuprofen has a long half-life, but due to its slower absorption in the gastrointestinal tract, its onset of action is also slow.<sup>[5]</sup> When administered orally, it takes >30 min to produce relief of pain.<sup>[6]</sup> Therefore,

ibuprofen has a practical benefit in the management of post-operative pain.

Paracetamol is a mild analgesic. It is used for the relief pains and is a major ingredient in numerous cold and flu remedies.<sup>[7]</sup> In combination with opioid analgesics, paracetamol can also be used in the management of more severe pain such as post-surgical and cancer pain.<sup>[2]</sup> Although paracetamol is used to treat inflammatory pain, it is not generally classified as an NSAID because it exhibits only weak anti-inflammatory activity.<sup>[8]</sup>

Therefore, clinician should be mindful about the efficacy of drug in post-extracted dental pain.<sup>[9]</sup> Therefore, the present study investigated about the comparison of the efficacy of ibuprofen and paracetamol in the treatment of post-extracted dental pain.

## MATERIALS AND METHODS

Patients reporting to Saveetha Dental College and Hospital with the chief complaint of pain and advised

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extraction were included in the study. Each participant was given a brief explanation of the study, and informed consent was obtained from each participant before inclusion in the study. A total of 30 patients were included in the study, and the gender was not taken into account for this study.

Each patient must understand the questionnaire given to them and given their consent to be a part of the study. The patients then underwent dental extraction. The extractions must be done using similar techniques without any complications. The patients are then given their post-operative instructions along with the medication and the questionnaire. The patients are asked to mark the questionnaire based on the level of pain after taking the medication.

The drug paracetamol along with antibiotic (amoxicillin) was given to 15 patients. Moreover, ibuprofen along with amoxicillin was given to the other 15 patients. After 3 consecutive days, they were asked to give their scoring mention in the questionnaire [Figure 1].

The score indicates 0 (no hurt), 1(hurts little bit), 2 (hurts little more), 3 (hurts even more), 4 (hurts whole lot), and 5 (hurts worst). Higher scores indicate worse and lower scores indicate better efficacy of drug in the treatment of post-extracted dental pain.

## RESULT

A total of 30 healthy patients were included in this study. Gender has no relationship with the score. Patients have less dental pain while taking ibuprofen when compared to patients having paracetamol. The scores are calculated in percentage and are mentioned in Table 1.

Tables 2 and 3 show the efficacy of ibuprofen and paracetamol in 3 consecutive days.

## DISCUSSION

NSAIDs have been used for >25 years to treat rheumatological disease.<sup>[10]</sup> They were then introduced to relieve pain after tooth extraction and to provide post-operative analgesia.<sup>[11]</sup> They act by inhibiting

the action of cyclooxygenase enzyme which, in turn, blocks the pain pathway. When used alone, they are effective in relieving minor-to-moderate pain such as that seen after maxillofacial, minor orthopedic, or some ambulatory surgical procedures and postpartum pain.<sup>[12]</sup> NASIDs have additional anti-inflammatory activity, lacking in opioids, which plays an important role in relieving post-operative pain and inflammation.<sup>[13]</sup>

The ibuprofen appears to show that it is an effective analgesic for treating moderate or severe post-operative pain. A rank order of the efficacy of different analgesics compared with paracetamol exists which allows comparison between different analgesics.<sup>[14]</sup> This has been published previously in its entirety<sup>[15]</sup> and for third molar extraction studies only (Barden 2004). It is also available on the World Wide Web.<sup>[16]</sup> This rank order shows that ibuprofen has a lower score (better) when compared to paracetamol.<sup>[17]</sup>

Post-operative patients do genuinely develop fever for a number of reasons; some related to the anesthetic

**Table 1: Correlation of study sample of patient who received ibuprofen and paracetamol**

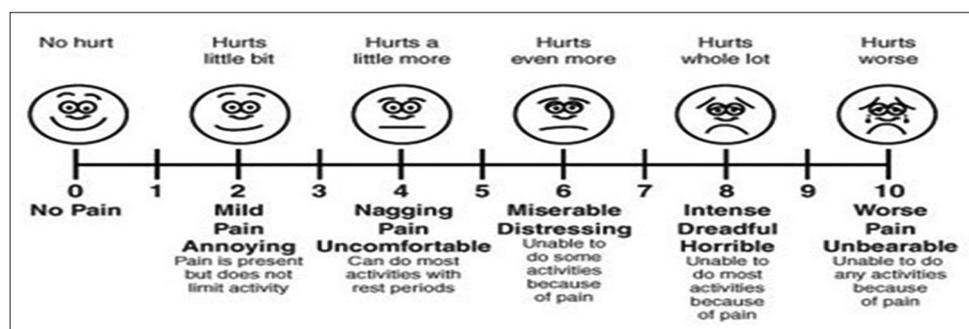
Score	Ibuprofen (%)	Paracetamol (%)
0	91.40	83
1	85.60	69
2	66.60	52.40
3	60	44.60

**Table 2: Scores(%) for efficacy of ibuprofen in three consecutive days**

Days	0	1	2	3	4	5
Day 1		71.30%	20%	7.60%		
Day 2	24.66%	60%	13.30%			
Day 3	92.30%	6.60%				

**Table 3: Scores (%) for efficacy of paracetamol in three consecutive days**

Days	0	1	2	3	4	5
Day 1		24.60%	54.30%	20%		
Day 2	32.30%	46.60%	20%			
Day 3	80%	20%				



**Figure 1:** Pain scale

techniques and surgical handling and others due to infective complications.<sup>[18]</sup> Ibuprofen also has antipyretic properties<sup>[19]</sup> and would have acted to reduce the number of participants experiencing fevers. Thus, it would be misleading to look for fever as an adverse effect.<sup>[20]</sup>

From the result of this study, it is clearly evident that a patient who received ibuprofen has less dental pain when compared with a patient who received paracetamol. This will help clinicians in prescribing medication after dental extraction.

Ibuprofen is a NSAID which is used to relieve post-operative pain. Like other NSAIDs, mechanism of action is by inhibition of the cyclooxygenase enzyme, resulting in reduced prostaglandin synthesis, which is responsible for pain and inflammation.<sup>[21]</sup> Paracetamol is a mild analgesic. It is used for the relief pains and is a major ingredient in numerous cold and flu remedies. In combination with opioid analgesics, paracetamol can also be used in the management of more severe pain such as post-surgical and cancer pain.

Although care has to be taken while prescribing ibuprofen, the drug can cause adverse effects in individuals with certain medical conditions. Patients who give a history of asthma, hypertension, cardiac failure, frequent bleeding, systemic mastocytosis, stroke, blood clot, and pregnant must not be prescribed ibuprofen.<sup>[22]</sup>

Paracetamol also called acetaminophen is a relatively safe drug which is safe to use during pregnancy. It does not directly block the cyclooxygenase inhibitors but reduces the secretion of the enzyme. It acts primarily by modulating the endogenous cannabinoid system in the brain through paracetamol metabolite AM404. Although excess usage of paracetamol leads to liver failure, paracetamol is a mild analgesic. It does not have significant anti-inflammatory action. Therefore, the efficacy of paracetamol when compared to ibuprofen in control of pain after extraction is reduced.

## CONCLUSION

From this study, it is clearly evident that a patient who received ibuprofen has less dental pain when compared with a patient who received paracetamol associated with antibiotics (amoxicillin). This will help clinicians in prescribing medication after dental extraction.

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