Original Article – Comparative Study

Analgesic efficacy of acetaminophen for controlling postextraction dental pain

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ABSTRACT

Background: Considering the clinical safety of acetaminophen over other nonsteroidal anti-inflammatory drugs, this clinical trial was formulated to assess the analgesic efficacy of acetaminophen for controlling postextraction dental pain when compared to commonly prescribed ibuprofen. **Aim:** The aim was to assess the analgesic efficacy of paracetamol/acetaminophen in postextraction dental pain. **Settings and Design:** Double-blind, randomized prospective clinical trial. **Materials and Methods:** A total of 30 patients requiring bilateral maxillary and mandibular premolar extraction for their orthodontic treatment were included in the study to evaluate the efficacy of acetaminophen in controlling postextraction dental pain. **Statistical Analysis Used:** Unpaired *t*-test. **Results and Conclusions:** Clinically, both the postoperative analgesics exerted similar pain control with minor variations of recorded visual analog scale scores by the patients in both the groups. It may be concluded from the findings of this study that paracetamol at a dosage of 500 mg thrice a day (1.5 g) is sufficient to achieve reliable pain control following exodontia provided the surgical trauma caused to the investing tissues is minimal.

Keywords: Acetaminophen, analgesic, dental pain, ibuprofen, paracetamol

INTRODUCTION

Acetaminophen or paracetamol is chemically N-acetyl-p-aminophenol, and is classified as an analgesic and antipyretic. The safer clinical profile of acetaminophen within permissible dosage has promoted the drug as "over the counter" for pain and fever. Paracetamol is the analgesic of choice for patients in whom other nonsteroidal antiinflammatory drugs (NSAIDs) are contraindicated.[1] Considering the clinical safety of acetaminophen over other NSAIDs, this clinical trial was formulated to assess the analgesic efficacy of acetaminophen for controlling postextraction dental pain when compared to commonly prescribed ibuprofen.

MATERIALS AND METHODS

A prospective double-blind, randomized clinical trial setting was used for the presented study. Medication used in the study is commercially available per-oral tablets, approved for use by the regulatory authorities in India and listed in the National Formulary of India 2011. A random selection of 30 patients who had reported to the outpatient department requiring bilateral maxillary and mandibular premolar extraction for their orthodontic treatment were included in the study, after written informed consent. All 30 candidates were medically fit for an oral surgical procedure under local anesthesia (mean age = 16.1 ± 3.32, Hi = 25.0 Low = 12.0; 19 males and 11 females). All the patients were undertaken for dental extraction for the first and fourth quadrant at their first appointment followed by extraction of the second and third quadrant after a week (second appointment). All the care was taken to cause minimal trauma to the investing tissues of the tooth. Thirty patients included for the study were divided into two groups by random sampling and were given coded envelopes containing the analgesic medication for use in the postoperative period with a visual analog scale (VAS) score card. Study group-I received ibuprofen 400 mg (9 tablets) and study group-II received

paracetamol 500 mg (9 tablets). All the patients were instructed about the VAS score card entry and the medication preoperatively. All the filled VAS score cards and the coded envelopes were collected back from the patients at the end of their medication schedule of 3 days, and the data were tabulated, compiled, and analyzed statistically by the data analyst (unpaired *t*-test). The chief investigator (operating surgeon) was blinded for the medication and study groups, which was managed by the nursing technicians of the operatory.

RESULTS

The overall mean VAS scores for 3 days was comparatively less for study group-I. Although there was no statistically significant pain control in one group over the other [Table 1]. Clinically, both the postoperative analgesics exerted similar pain control with minor variations of recorded VAS scores by the patients in both the groups. The mean VAS scores (±standard deviation) in group-I on day 1, day 2, day 3 were 1.16 ± 0.648, 0.60 ± 0.49, and 0.23 ± 0.43, respectively. For group-II VAS scores on day 1, day 2, day 3 were 1.20 ± 0.6, 0.70 ± 0.59, 0.36 ± 0.49, respectively. Statistically, the two study groups demonstrated no significant difference in the analgesic efficacy of the two study drugs [day-wise comparisons done using unpaired *t*-test - Table 2]. No adverse events/adverse drug reactions were encountered in the study patients.

DISCUSSION

In vivo studies with paracetamol or acetaminophen have shown its similarity with the selective cyclooxygenase-2 inhibitors except its limited ability to suppress inflammation. Although there remains evidence that it does decrease swelling after oral surgery in humans and suppresses inflammation in rats and mice.[2] It is considered as an alternate to other NSAIDs, and safe substitute in patients where there is relative or absolute contraindication of various other available NSAIDs. It has been considered as a relatively safe analgesic by the physicians in patients with asthma, gastric/peptic ulcers and also in altered physiological states like pregnancy.[3-5] This study evaluated the analgesic efficacy of paracetamol after a dental extraction in comparison with ibuprofen, a commonly prescribed NSAID following exodontia. The statistical analysis and comparative VAS data on first 3 postoperative days clearly show that paracetamol is definitely an alternate to other NSAIDs in managing pain following dental extraction. A limitation of this study remains in the fact that all the patients underwent elective orthodontic extractions where there was no preexisting infection and the surgical trauma caused to the investing tissues was minimal. Recovery in both the patient groups was uneventful with predictable pain control. Although few authors have found a statistically significant benefit with 1000 mg (in comparison with doses < 1000 mg), the higher dose giving greater benefit for pain relief and intensity, in our study we were able to achieve clinically effective pain relief at the dosage of 500 mg TDS.[1,6] Keeping this individual dosing of paracetamol minimal may have its benefits in preventing overdose reactions.[7] This study was limited to noninfected elective exodontia cases with minimal surgical trauma, although there have been reports of paracetamol being a safe, effective drug for the treatment of postoperative pain following the surgical removal of lower wisdom teeth.[8]

Table 1: VAS scores in the two study groups

	Ibuprofen			Acetaminophen		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
Mean±SD	1.16±0.648	0.60±0.49	0.23±0.43	1.20±0.61	0.70±0.59	0.36±0.49

VAS: Visual analog scale; SD: Standard deviation

Table 2: Comparison of pain control

Comparison of pain control between ibuprofen and acetaminophen using unpaired *t*-test

Postoperative day	Day 1	Day 2	Day 3
t value	−0.205	−0.705	−1.12
SD	0.629	0.549	0.461
Probability of this result	0.84	0.48	0.27

SD: Standard deviation

CONCLUSION

Paracetamol is a safe, effective drug for the treatment of postexodontia pain. It may be concluded from the findings of this study that paracetamol at a dosage of 500 mg thrice a day (1.5 g) is sufficient to achieve reliable pain control following exodontia provided the surgical trauma caused to the investing tissues is minimal. Finding of this study is based on the cases included for this study where elective orthodontic extractions were done with no preexisting infection.

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