ANALGESIC EFFICACY OF PARACETAMOL VS KETOROLAC AFTER DENTAL EXTRACION

Running Title: Paracetamol vs. Ketorolac after Dental Extraction

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ABSTRACT

Aim

To evaluate the analgesic efficacy of paracetamol(500mg) andketorolac(10mg) after dental extraction.

Materials and Method

Patient seeking dental extraction in Saveetha Dental College were included in this study. Each participant was given a brief explanation of the study, and informed consent was obtained from each participant before inclusion in the study.20 patients were randomized into two treatment groups (each with 10 patients: group A received Paracetamol 500 mg and group B received Ketorolac 10 mg, orally. The durations of analgesia and pain intensity were recorded at the time interval of 10 minutes, 1 hour, 3 hours, and 6 hours. The pain intensity is recorded using the visual analog system (VAS).

Results

The duration of analgesia was longer in the Ketorolac group when compared with the Paracetamol group. Patients who received Ketorolac had lower pain intensity compared with patients who received Paracetamol.

Conclusion

Ketorolac 10 mg is more effective than paracetamol 500mg after dental extraction when used as analgesic.

***KEYWORDS*: Dental pain, ketorolac, paracetamol, extraction**

INTRODUCTION

Dental extraction is the most common procedure carried out by oral surgeons, and it is a common model for evaluating the efficacy of analgesics for acute dental pain relief [1]. It is often associated with swelling, pain, and trismus [2].The pain of tooth extraction is likely to be the most severe pain that an individual experiences during his or her life. [3] Many individuals rate the pain of tooth extraction as very severe or intolerable. The pain of tooth extraction varies among individuals, and each extraction of an individual may be quite different. Management of post-extraction pain relieves suffering and leads to earlier mobilization, shortened hospital stay, reduced hospital costs and increased patient satisfaction.[4,5,6] Pain associated with surgical removal of teeth ranges between moderate and severe during the first 24 hours after surgery, with the major pain intensity occurring between 6 and 8 hours when a conventional local anesthetic is used [7].

Dental pain is largely inflammatory, and evidence based medicine has shown that non-steroidal anti-inflammatory drugs (NSAIDs) are the best analgesics for dental pain.[8] The analgesic, anti-inflammatory, and antipyretic effects of NSAIDs are a result of the ability of these agents to inhibit cyclo-oxygenase (COX) enzymes, which catalyze the conversion of arachidonic acid to prostaglandins, which are fatty acids involved in the generation of pain, fever, and inflammation. [9] Ketorolac is a proven and commonly prescribed NSAID with analgesic, anti-inflammatory, and antipyretic properties it has been shown to be effective in treating a variety of acute and chronic pain and inflammatory conditions.[10] Ketorolac has been used widely in pain control and has good analgesic effectiveness after extraction. Ketorolac exerts its action via inhibition of prostaglandin synthesis by inhibiting COX-1 and COX-2 with relative equi-potency.[11]

Paracetamol also known as acetaminophenol or APAP, chemically named N-acetyl-p-aminophenol, is a widely used over-the-counter analgesic (pain reliever) and antipyretic (fever reducer). Paracetamol is classified as a mild analgesic. Combined with opioid analgesics, paracetamol can also be used in the management of more severe pain such as post-surgical and cancer pain. Though paracetamol is used to treat inflammatory pain, it is not generally classified as an NSAID because it exhibits only weak anti-inflammatory activity. [12-13] The main mechanism proposed is the inhibition of cyclooxygenase (COX), and recent findings suggest that it is highly selective for COX-2. Because of its selectivity for COX-2, it does not significantly inhibit the production of the pro-clotting thromboxanes. Although it has analgesic and antipyretic properties comparable to those of aspirin

or other NSAIDs, its peripheral anti-inflammatory activity is usually limited by several factors, one of which is the high level of peroxides present in inflammatory lesions. [14-15]

MATERIALS AND METHODS

Patient seeking dental extraction were included in this study. They were reported to Saveetha Dental College and Hospitals for extraction. Each participant was given a brief explanation of the study, and informed consent was obtained from each participant before inclusion in the study. 20 patients were randomized into two treatment groups (each with 10 patients) by using a series of random numbers: group A received Paracetamol 500 mg and group B received Ketorolac 10 mg, orally.To be included in the study, patients has some following criteria: Each patient should understand the pro forma given to them.Patients were asked to report in scoring.Each patient must be about to have dental extraction.Each patient should understand and give the score to questionnaires.Each patient must be eligible and no contraindication should exist. Gender had no relationship with the scores. A total number of twenty healthy patients were selected. The drug paracetamol and ketorolac is given to 10 patients respectively,along with antibiotic(Amoxicillin).

ASSESSMENTS

The duration of analgesia of the administered drugs after surgery was evaluated as the time from the end of the surgery until the intake of the first rescue analgesic medication became necessary for the patient. A 10-mm visual analog scale (VAS) was used to asesss pain. The VAS consisted of an interval scale ranging from 0, representing no pain or discomfort, to 10, representing maximum pain or discomfort. Clinical assessments were done using the VAS at 10 minutes, 1 hour, 3 hours, and 6 hours after surgery. The patient was given a copy of VAS for the assessment of pain for 10 minutes, 1 hour, 3 hours and 6 hours. The patient was instructed to take the rescue analgesic medication at least 6 hours apart. The duration of which the rescue analgesic medication was taken is recorded.

Visual Analog Scale (VAS)

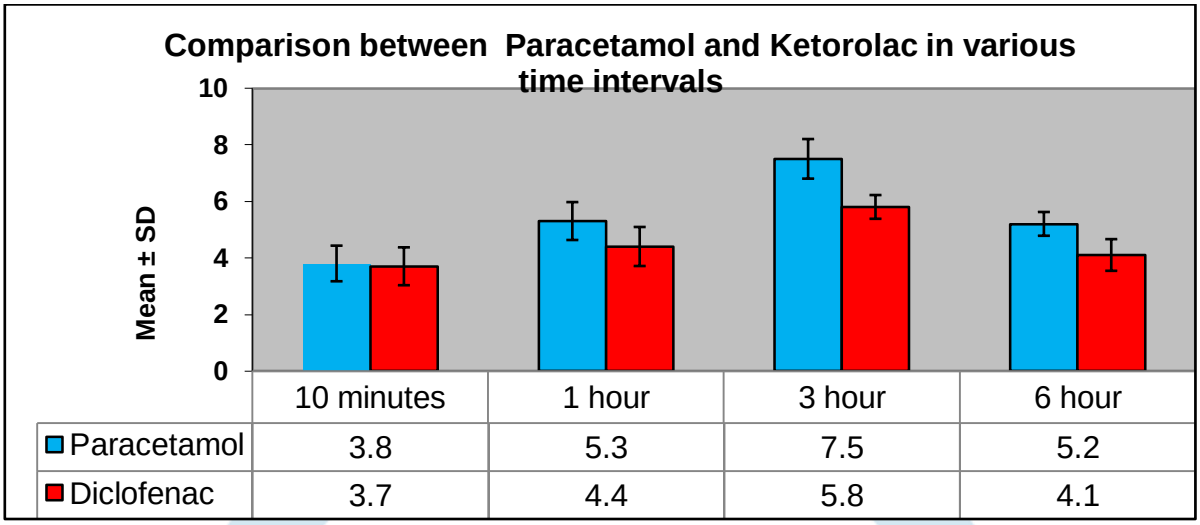
RESULT

A total number of 20 patients were selected randomly for this study. These 20 patients are diagnosed for an extraction of teeth without any surgical complication. Gender has no relationship with the score. Their pain intensity and the intake of rescue medication is recorded and analysed to evaluate the analgesic effect of each drug. According to the study done, Patient who were given Ketorolac (10mg) show a higher analgesic effect compare to Paracetamol (500mg). Patient has less dental pain while taking ketorolac when compared with patient having paracetamol. The scores are calculated and mentioned as below.

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean	P Value
10 minutes	Paracetamol	10	3.81	.632	.202	0.71
	Ketorolac	10	3.70	.675	.211	
1 hour	Paracetamol	10	5.32	.677	.211	0.009
	Ketorolac	10	4.43	.689	.231	
3 hours	Paracetamol	10	7.40	.717	.214	< 0.0001
	Ketorolac	10	5.60	.412	.143	
6 hours	Paracetamol	10	5.20	.412	.133	0.0006
	Ketorolac	10	4.30	.548	.182	

Graph



DISCUSSION

This study shows that the administration of ketorolac is more effective than paracetamol in the control of pain after dental extraction. The mean duration of analgesia obtained by the administration was longer in patients who received ketorolac compared with those who received paracetamol. Ketorolac provides effective postoperative analgesia when administered either orally or parenterally [16]. Preliminary studies suggested that oral ketorolac possesses potent analgesic activity in the postoperative period [17]. When ketorolac was administered in an intravenous-oral sequence after ambulatory surgery, it produced fewer side effects than the combination ofacetaminophen and codeine [18].

NSAIDs have been used for more than 25 years to treat rheumatological disease. They were then introduced to relieve pain after tooth extraction and to provide post-operative analgesia. [19] When used alone, they are effective in relieving minor to moderate pain such as that seen after maxillofacial, minor orthopaedic or some ambulatory surgical procedures and postpartum pain NASIDshave additional anti-inflammatory activity, lacking in opioids, which plays an important role in relieving post-operative pain and inflammation. [20]

Ketorolac appear to show that it is an effective analgesic for treating moderate or severe postoperative pain. A rank order of the efficacy of different analgesic compared with paracetamol exists which allows comparison between different analgesics. This has been published previously in its entirety [21]and for third molar extraction studies only. This rank order shows that ketorolac has a lower score (better) when compared to paracetamol Its efficacy is comparable to that of other NSAIDs, for example ibuprofen and diclofenac. [22]

Postoperative patients do usually develop fevers for a number of reasons; some related to the anaesthetic techniques and surgical handling, others due to infective complications. [23]Ketorolac also has anti-pyretic propertiesand would have acted to reduce the number of participants experiencing fever.Thus it would be misleading to look for fever as an adverse effect. [24]

Forbes et al. [25] reported better analgesia and a decrease incidence of side effects with ketorolac, 10 mg compared with codeine 60 mg plus acetaminophen 600 mg and paracetamol 500mg in post operative oral surgery. Wong et al. [26] reported a lower incidence of nausea and somnolence in the patients receiving ketorolac 10 mg and paracetamol 500mg. Ketorolac does not depress central respiratory drive [27] or produce adverse effects on gastrointestinal function [28]

McQuay et al. [29] reported that 1 gram of oral acetaminophen was similar to 10-20 mg of ketorolac taken orally for pain relief after orthopedic surgery.Zhou et al. [30] reported that 2 g of propacetamol (prodrug of paracetamol) has a shorter analgesic onset time than 15 mg or 30 mg of ketorolac in patients after total knee or hip replacement surgery (8 minutes with 2 g of propacetamol and 14 and 10 minutes in 15 mg and 30 mg of ketorolac, respectively).

Varrassi et al. [31] reported that 2 g of propacetamol showed a similar analgesic effect to that of 30 mg of ketorolac in a gynecological operation.

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

CONCLUSION

This study shows that ketorolac is better compared to paracetamol as analgesia. Patient given ketorolac showed a lower pain intensity and showed a longer time of analgesia compare to patient given paracetamol.

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