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Research Article

COMBINATION OF IBUPROFEN AND PARACETAMOL VERSUS MEFENAMIC ACID AND PARACETAMOL ON THE POST OPERATIVE PAIN FOLLOWING A PERIODONTAL SURGERY– A CLINICAL STUDY

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ABSTRACT

Pain is a common feature of the early postsurgical stage. Numerous studies have been conducted to investigate the effect of non-steroidal anti-inflammatory drugs (NSAIDs) to control postoperative pain after periodontal surgery. There has been a trend over recent years for combining a nonsteroidal antiinflammatory drug (NSAID) with paracetamol (acetaminophen) for pain management. The purpose of this study was to compare analgesic efficacy of two NSAIDS, ibuprofen and mefenamic acid in combination with paracetamol in the management of post operative pain after periodontal surgery. Total of 30 patients were included in the study and divided into 2 groups. Group A – Ibuprofen (400mg) + Paracetamol (375mg). Group B - Mefenamic acid (500mg) + Paracetamol(450mg). Postoperative pain was assessed during the first 8 hours and on the following 3 days using the four-point verbal rating scale (VRS-4) and visual analog scale (VAS). There was relatively equal pain control in group A and group B according to VRS-4 and VAS. There was no significant difference between both the groups. Paracetamol in combination with ibuprofen and mefenamic acid was equally efficient in the control of pain following a periodontal surgery.

Keywords: Post Operative Pain, Paracetamol, Ibuprofen, Mefenamic Acid, Periodontal Surgery.

INTRODUCTION

Surgical periodontal procedures are an integral component of the recent approach to the treatment of periodontal diseases[1]. Postoperative pain after periodontal surgical procedures is a common occurrence. Post operative pain management (POP) after surgery is one of the important factors in patient satisfaction and adherence to ongoing treatment phases. The perception of pain is highly subjective and therefore varies considerably among individuals[2]. Many factors may influence pain intensity, such as the nature, duration, and extent of the surgery[1] and psychological aspects, such as stress and anxiety[3]. The pain experience has been shown to peak in the first twenty-four hours following the procedure, and to decrease rapidly in subsequent days as shown by Seymour[4]. Control of postoperative pain is thus a required part of periodontal therapy. Curtis et al. 1985 indicated that these pain levels may be anticipated to vary, depending on the category of the periodontal surgical procedure[1].

According to one study 70% of patients perceive some degree of pain following periodontal surgery, although most were only mild to moderate range; 44.1% people reported moderate pain; and 4.6% reported severe pain.1 A total of 79% of the patients related pain after open-flap debridement surgery, 89% after gingivectomy, and 93% after open-flap surgery with osseous resection[5].

It has been shown that non-steroidal anti-inflammatory agents have a significant benefit in the control of postoperative pain after periodontal or oral surgical procedures[6-8]. Numerous studies have been conducted to investigate the effect of non-steroidal anti-inflammatory drugs (NSAIDs) to control postoperative pain and inflammation after periodontal surgery, with generally favorable results[9-14]. Of these substances, paracetamol and ibuprofen are the most widely used. Paracetamol is a centrally acting NSAID that has analgesic and antipyretic actions and devoid of anti-inflammatory activity while ibuprofen is a centrally as well as peripherally acting drug which has analgesic, antipyretic and anti-inflammatory activities. Ibuprofen was found to have analgesic efficacy better than paracetamol[15-17]. Combination of paracetamol and ibuprofen was more effective than ibuprofen alone in managing postoperative pain[18]. Mefenamic acid is an

NSAID most often used for treating pain of dysmenorrhoea, as well as mild to moderate pain including headache, dental pain, postoperative and postpartum pain.

There are very few studies done to evaluate the combination of mefenamic acid and paracetamol in managing post operative pain. Therefore in this study a combination of ibuprofen and paracetamol versus mefenamic acid and paracetamol was used to find the efficacy in controlling post operative pain following periodontal surgery.

The purpose of this study was to compare analgesic efficacy of two NSAIDs, ibuprofen and mefenamic acid in combination with paracetamol in the management of post operative pain after periodontal surgery.

MATERIALS AND METHODS

Thirty patients with the age group of 25-55 years were selected in the Department of Peridontology, H.K.E.S's S. N Dental college with generalized moderate to severe chronic peridontitis and/or mucogingival problems who need some surgical periodontal treatment and were operated. Ethical clearance was taken from the ethical clearance committee at H.K.E Society's S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga, Karnataka. A brief introduction about the study was given to the concerned authority about the purpose and nature of the study and prior permission was obtained. All patients were informed of the purpose of this study and signed an informed consent form.

Patients with a history of systemic disease, such as diabetes mellitus, hypertension, or gastric ulcer; females who were pregnant or lactating; and patients allergic to any of the formulations used in the study, using analgesics or anti-inflammatory drugs, or at risk for infective endocarditis were excluded from the study. Thirty patients were randomly divided into 2 groups. Group A (15 patients) who received Ibuprofen (400mg) + paracetamol (375mg); Group B (15 patients) who received Mefenamic acid (500mg) + paracetamol (450mg) post operatively following periodontal surgery.

Patients were instructed to complete a pain diary every hour for the first 8 hours after the surgery and three times a day on the following 3 days. Two methods of measuring clinical pain intensity were used in this study. The visual analog scale (VAS), which consists of a 10-cm line anchored by two extremes: ''no pain'' and ''pain as bad as it could be.'' Patients were asked to make a mark on the line that represents their level of perceived pain. In the four-point verbal rating scale (VRS-4), the patient is asked to choose one of four options: no pain, some pain, considerable pain, or pain that could not be more severe[23]. All participants received rescue medication and were instructed to take this medication as needed, writing in the diary each time the medication was used.

STATISTICAL ANALYSIS

Student t test was used to find the statistical significance differences between the mean and standard deviation of the pain scores using the visual analog scale and verbal rating scale of group A and group B.

RESULTS

Distribution of different surgical procedures (Figure 1&2)

In Group A 66.7% were treated with open flap debridement, 20 % with mucogingival surgery, 13.33% with regenerative/resective surgery. In Group B 73.33% were treated with open flap debridement, 13.33% were treated with mucogingival and regenerative/resective surgery.

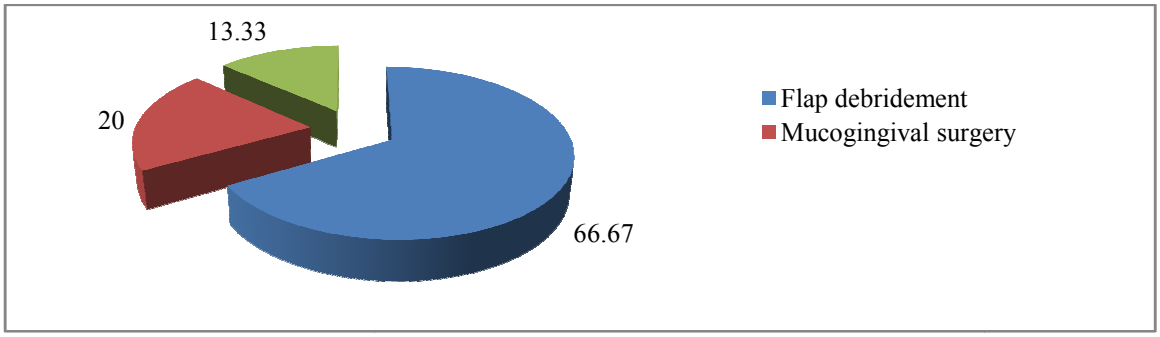

Figure 1: Distribution of Different Surgical Procedures of Group A (In Percentage)

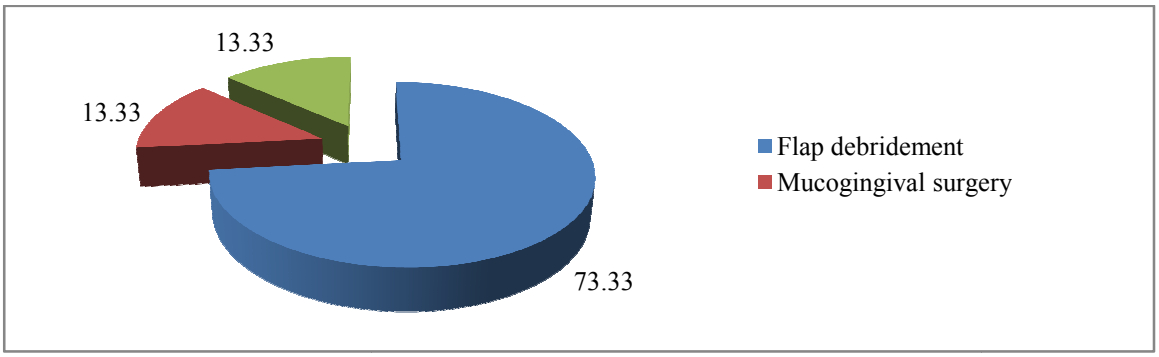

Figure 2: Distribution of Different Surgical Procedures of Group B (In Percentage)

In table 1, the mean and standard deviation for the pain scores using VAS for group A and group B are shown. There was no statistical significance between both the groups except in the 1st hr.

Table 1: Mean and Standard Deviation for Pain Scores Using VAS for Group A and Group B

	GROUP A		GROUP B		T value
	MEAN	SD	MEAN	SD	
1st Hr	6.00	1.21	6.80	1.11	1.82NS
2nd Hr	5.93	0.99	6.93	0.93	2.15
3rd Hr	5.80	0.75	6.93	0.85	3.74
4th Hr	6.00	0.63	7.40	0.61	5.96
5th Hr	6.40	0.61	7.40	0.49	4.77
6th Hr	6.60	0.49	7.53	0.49	4.99
7th Hr	6.77	0.40	7.67	0.47	5.43
8th hr	7.07	0.25	7.60	0.49	3.63
1st day morning	7.07	0.25	7.87	0.34	7.09
1st day afternoon	7.30	0.44	8.00	0	5.96
1st day night	7.63	0.46	8.03	0.12	3.11
2nd day morning	7.93	0.25	8.30	0.40	2.91
2nd day afternoon	8.00	0	8.40	0.42	3.59
2nd day night	8.03	0.12	8.67	0.43	5.24
3rd day morning	8.27	0.40	8.97	0.29	5.29
3rd day afternoon	8.37	0.46	8.97	0.29	4.11
3rd day night	8.43	0.44	9.07	0.36	4.16

In table 2 and figure 3, the mean and standard deviation for the pain scores using VRS-4 for group A and group B are shown. There was no statistical significance between both the groups at any time. None of the patients reported the highest degree of pain in the VRS-4 (pain that could not be more severe) at any time.

Figure 4 shows the means for pain score using VAS for group A and group B for flap debridement. The diagram presents that with flap debridement the intensity of the pain at 8th hour did not exceed the value 3.0 according to the scale VAS (value 3.0 corresponds to a moderate pain) and during the studied 3-days period it considerably decreased. On the fourth day of intervention the registered pain value was 1.0 (which corresponds no pain).

Figure 5 shows the means for pain score using VAS for group A and group B for mucogingival surgery. During the first 8 hours the pain is most expressive. Until the fourth hour after the intervention the values are up to 4 (which corresponds to moderate pain and discomfort). On the fourth day of intervention the registered pain was 1.0 (which corresponds to no pain).

Figure 6 shows the mean for pain score using VAS for group A and group B for regenerative/resective surgery. At the 3rd hour the pain intensity was about 3.5 (corresponds to moderate pain) and gradually reduced by the fourth day where the value corresponds to 1.0 which means no pain.

Table 2: Mean and Standard Deviation for Pain Scores Using VRS-4 for Group A and Group B

	GROUP A		GROUP B		T value
	MEAN	SD	MEAN	SD	
1st Hr	2.60	0.49	2.73	0.44	0.76NS
2nd Hr	2.53	0.49	2.60	0.49	0.36NS
3rd Hr	2.27	0.44	2.33	0.47	0.39NS
4th Hr	1.93	0.25	2.00	0	1.00NS
5th Hr	1.87	0.34	1.80	0.40	0.48NS
6th Hr	1.60	0.49	1.73	0.44	0.76NS
7th Hr	1.27	0.44	1.27	0.44	0NS
8th hr	1.13	0.34	1.27	0.44	0.89NS
1st day morning	1.13	0.34	1.20	0.4	0.48NS
1st day afternoon	1.13	0.34	1.13	0.34	0NS
1st day night	1.13	0.34	1.07	0.25	0.59NS
2nd day morning	1	0	1	0	-
2nd day afternoon	1	0	1	0	-
2nd day night	1	0	1	0	-
3rd day morning	1	0	1	0	-
3rd day afternoon	1	0	1	0	-
3rd day night	1	0	1	0	-

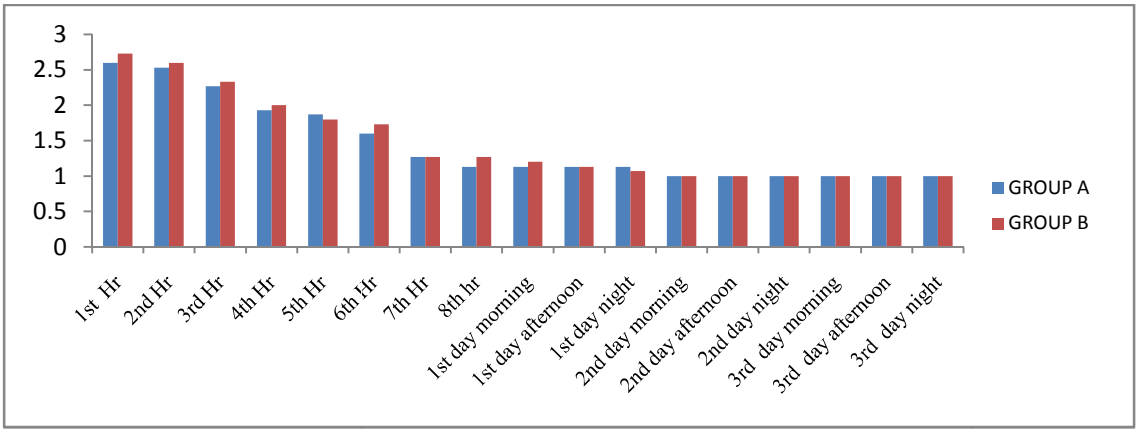

Figure 3: Means for Pain Score using VRS-4 For Group A and Group B

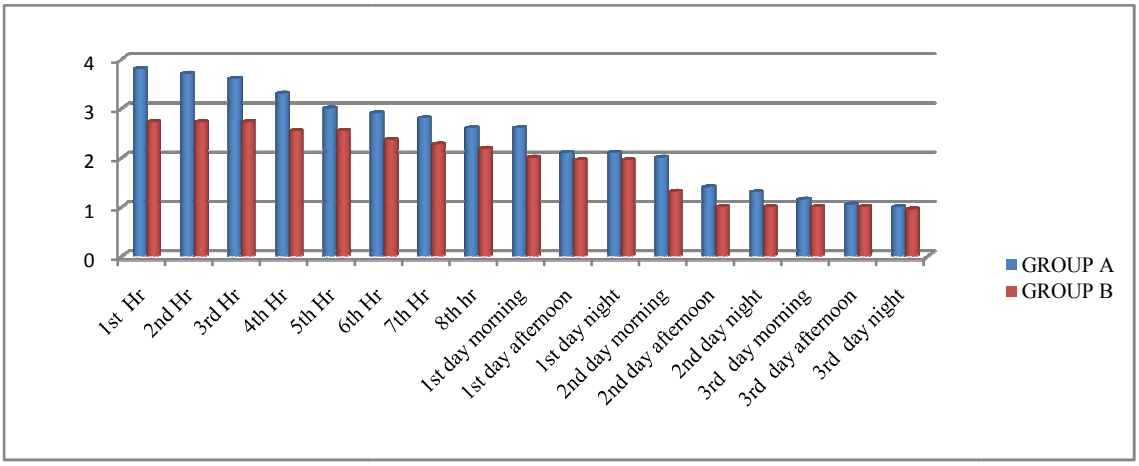

Figure 4: Means for Pain Score Using VAS for Group A and Group B for Flap Debridement

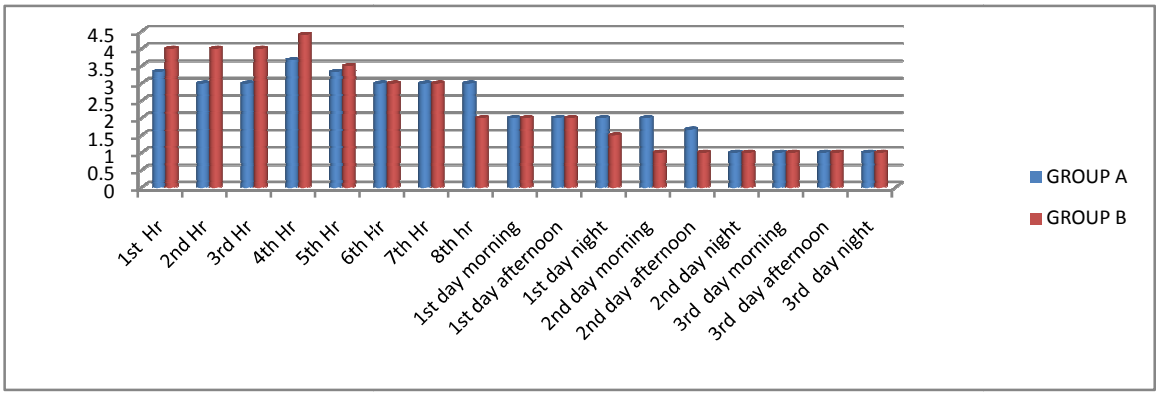

Figure 5: Means for Pain Score Using VAS for Group A and Group B for Mucogingival Surgery

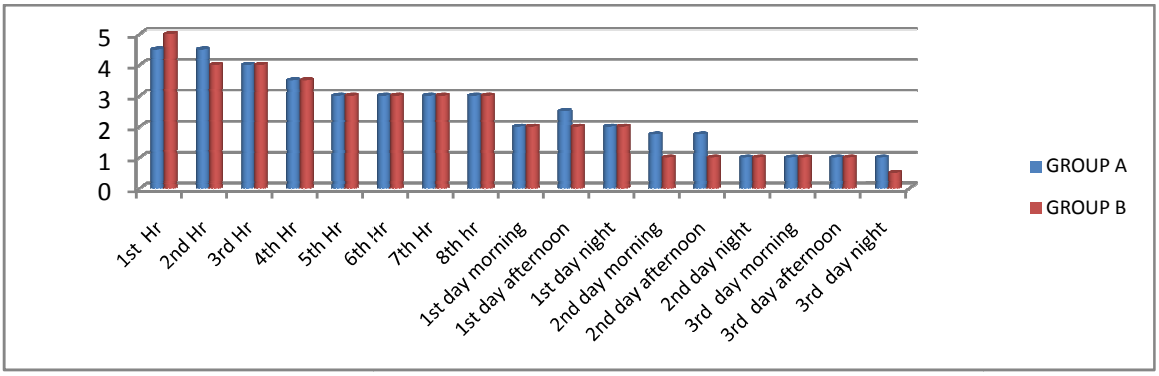

Figure 6: Means for Pain Score Using VAS for Group A and Group B for Regenerative/Resective Surgery

DISCUSSION

Nonsteroidal antiinflammatory drugs (NSAIDs) are drugs commonly prescribed in dental practice for the management of pain and swelling[19]. Although the surgical extraction of impacted third molars has become the most widely accepted model to compare the efficacy of analgesics and anti-inflammatory drugs, the prevention and control of postoperative pain after periodontal surgeries are also of great concern for patients and clinicians[9-14]. The open-flap debridement surgery is a pain model adopted and accepted in the literature because of its frequent use in periodontal practice, ease to recruit patients, and the possibility of a standardized surgical procedure[20,21]. Several studies have investigated different NSAIDs for this purpose, but in our study ibuprofen and paracetamol combination versus mefenamic acid and paracetamol combination has been used. Paracetamol is centrally acting analgesic, whereas ibuprofen and mefenamic acid excerts peripheral as well as central analgesic action.

Their mechanism of action is based on the inhibition of cyclooxygenase, and therefore of prostaglandin synthesis. All of these drugs present a similar mechanism of action, as a result of which their side effects are also similar[19]. Many chemical mediators of inflammation are released as a result of tissue injury caused by surgical trauma to the periodontal tissues. Two isoforms of cyclooxygenase (COX) enzyme have been identified: COX-1, a constitutive form expressed in many tissues, such as stomach, intestine, kidneys, and platelets; and COX-2 an inducible form expressed constitutively in a few organs (brain and kidneys). COX-2 is induced by growth factors cytokines and mitogens, and is primarily responsible for the production of prostaglandins that mediate vasodilatation, increase vascular permeability, and decrease the pain threshold[9-14].

Many studies employed a VAS-4[11,12,22] or a VRS-4[10,13,14] during a 3- to 10-hour period of pain evaluation as the method of choice for rating the patient's pain perception. In this study, pain intensity was recorded at the first 8 hours and also 3 days after the surgery. According to Jensen et al an 8-hour period seems to be appropriate for pain intensity assessment because pain was rarely reported on the following 3 days[23].

Ershad Aghasizadeh et al 2011 found that naproxen is more efficient than ibuprofen because of the short acting nature of this drug[24]. Alex Semenoff-Segundo et al 2013 found that there was no difference in postoperative periodontal surgery pain after the use of ibuprofen and paracetamol[25]. In our result there was relatively equal pain control in group A and group B according to the VRS-4 and VAS. There was no significant difference between both the groups. No adverse effect was reported in both the groups. Current evidence suggests that a combination of paracetamol and an NSAID may offer superior analgesia compared with either drug alone. So in our study combination of paracetamol with other NSAIDs was done to check there efficacy on pain control.

CONCLUSION

A non-steroidal anti-inflammatory analgesic agent in combination appears to be more effective in limiting pain following periodontal surgery. There was no difference in the postoperative pain in both the groups. Paracetamol in combination with ibuprofen and mefenamic acid was equally efficient in the control of pain following a periodontal surgery.

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