

Piroxicam versus Ibuprofen-Paracetamol Combination in Lower Third Molar Surgery

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ABSTRACT

Introduction: Lower third molar has served as a suitable model for assessment of inflammation for many studies. Various drugs and their combination have been used to test their effect on this model.

Objective: Main objective of this study was to compare the efficacy of Piroxicam with the widely prescribed Ibuprofen Paracetamol combination.

Materials and Method: This single center, single operator assisted non-randomised trial had 70 patients divided equally into both the groups. Inflammatory parameters such as trismus and swelling were measured for evaluation at different time intervals.

Result: The statistical results of ANOVA showed similar pattern for both trismus and swelling. Though there was no significant difference ($P>0.05$) on the seventh day, the results of the second day significantly favoured ($P<0.005$) Piroxicam.

Conclusion: Both the group of drugs showed equivalent efficacy after one week, though the immediate post-op benefit of Piroxicam and its ease of use cannot be overlooked.

Keywords: Comparison; ibuprofen-paracetamol combination; lower third molar extraction; piroxicam dispersible tablets.

INTRODUCTION

The lower third molars are present in 90% of the population and one third of it exhibits in an impacted form. Owing to the high incidence rate of impacted third molars, their surgical extraction is probably the most frequently performed operation in oral surgery.¹ Pain, swelling, and limitation in jaw movements are common sequel of this procedure. Reducing the incidence of these postoperative complications is very crucial and very challenging at the same time.^{2,3} The postoperative management of these cases mainly consists of opioids, cyclooxygenase inhibitors and local anesthetics.^{3,4} In our part of the world Ibuprofen Paracetamol combination has been widely used for analgesic as

well as anti-inflammatory purpose. Amongst the Non-steroidal anti-inflammatory drugs (NSAIDS), Piroxicam with its mode of action similar to that of indomethacin and a reliably longer half-life has made a mark.⁴ Though there have been studies comparing these two groups in pain management of orthodontic tooth movement,⁵ comparative study between the Ibuprofen-Paracetamol group and Piroxicam group for third molar surgery is not obtainable. The present study aims to evaluate and compare the therapeutic effect of Ibuprofen (400 mg) and Paracetamol (325 mg) combination, with Piroxicam (20mg) dispersible tablets (DT), with respect to trismus and swelling after third molar surgery.

MATERIALS AND METHOD

This open label non-randomised trial was conducted at the Dental Department of Western Regional Hospital Pokhara after obtaining ethical approval from the internal committee from 2014 August to 2015 December. This study was conducted as per the applicable regulatory guidelines and all the patients were recruited by convenience sampling method and were well informed about the procedure.

The inclusion criteria were: subjects with impacted lower third molars aged between 18 and 50 years and willingness to provide written informed consent to participate in the study and subsequent follow-ups. Exclusion criteria were: pregnant and breastfeeding women, subjects with known sensitivity to NSAIDs and other drugs, subjects taking psychotropic drugs or other chronic medication.

A single operator was assigned to perform all the surgeries. Seventy patients were allocated and randomisation was done based on the envelope the patients picked, which were of two colors with 35 pieces each totaling to 70 envelopes. Group A received Piroxicam (20 mg) DT two tablets (tabs) on first and second day followed by one tab on the third day. Group B received Ibuprofen-Paracetamol Combination three times daily for first three days.

The study outcomes trismus and swelling were recorded as follows:

1. For trismus, inter-incisal distances between incisor tips of upper and lower central incisor (or lateral incisors or canines in case of their absence of them) of same side of extraction at maximum unassisted mouth opening condition with a measuring scale pre-operatively and on post-operative days 2 and 7 were measured.
2. For swelling, as average of Horizontal Facial Measurement and Vertical Facial Measurement using an expandable paper measuring scale pre-operatively and on post-operative days 2 and 7 were done.⁶
 - Horizontal facial measurement was taken as the distance from the corner of the mouth to

the attachment of the ear lobe.

- Vertical facial measurement was taken as the distance from the outer canthus of eye to the angle of the mandible by palpating and marking the inferior border.
- Facial measurement = (Horizontal facial measurement + Vertical facial measurement) / 2

A single operator, following standard protocols, performed all anesthetic and surgical procedures. The data obtained were analysed using SPSS v.22 Software.

RESULT

Of the total 70 volunteers, 28 were males and 42 females with a mean age of 23 years. Patients were equally divided in both the groups. Surgical time was calculated from starting of the incision till closure of the surgical site. The surgical time ranged from 18-21 minutes for all the patients. No rescue medication was required for any of the volunteers. However, three patients in Ibuprofen Paracetamol group reported gastrointestinal disturbances. Shapiro-Wilk test of normality showed that facial contour data significantly deviate from a normal distribution ($P < 0.05$) and mouth opening data was normal ($P > 0.05$). Statistical significance was set at $P \leq 0.05$.

Friedman test showed a statistically significant difference in facial contour in both Piroxicam DT and Ibuprofen Paracetamol group ($P < 0.001$). Post hoc analysis with Wilcoxon-signed ranks test was conducted with a Bonferroni correction applied, resulting in a significance level set at $P \leq 0.017$. There was a statistically significant difference between pre-operative and day two ($P < 0.001$), pre-operative and day seven ($P < 0.001$), and day two and day seven ($P < 0.001$). Mann-Whitney U test showed a statistically significant difference at day two between Piroxicam DT and Ibuprofen Paracetamol ($P = 0.006$). No statistically significant difference was found at pre-operative and day seven between Piroxicam DT and Ibuprofen Paracetamol ($P = 0.394$, Table 1).

Table 1: Comparison of scores for facial contour (Mean±SD).

	Piroxicam DT	Ibuprofen Paracetamol	P value
Pre-Operative	123.87±2.13	123.82±1.74	0.891
Day 2	128.42±1.80	129.58±1.62	0.006*
Day 7	124.47±1.54	124.74±1.50	0.394

* Statistically significant at $P \leq 0.05$

Table 2: Comparison of scores for mouth opening (Mean (±SD)).

	Piroxicam DT	Ibuprofen Paracetamol	P value
Pre-Operative	46.38±0.72	46.36±0.61	0.890
Day 2	37.96±0.46	37.47±0.73	0.001*
Day 7	45.77±3.24	46.19±0.61	0.436

* Statistically significant at $P \leq 0.05$

A repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean mouth opening in both Piroxicam DT and Ibuprofen Paracetamol group differed statistically significantly between time points ($P < 0.001$). Post hoc test using the Bonferroni correction revealed statistical significance between pre-operative and day two ($P < 0.001$); and day two and day seven ($P < 0.001$) in Piroxicam DT group. In Ibuprofen Paracetamol group, statistical significance was found between pre-operative and day two ($P < 0.001$); pre-operative and day seven ($P < 0.001$); and day two and day seven ($P < 0.001$). Independent Samples T test showed a statistically significant difference at day two between Piroxicam and Ibuprofen Paracetamol ($P < 0.05$). No statistically significant difference was found at pre-operative ($P > 0.05$) and day seven ($P > 0.05$) between Piroxicam DT and Ibuprofen Paracetamol group (Table 2).

The results for swelling as well as trismus showed a similar pattern by demonstrating statistically significant difference on the day 2 ($P < 0.05$), while the difference was not statistically significant ($P > 0.05$) on day 7.

DISCUSSION

Inflammatory process preconditions normal tissue healing, but it often invites acute disturbance in the quality of life of the patient.⁷

The surgeon's differences in the skill and technique have been quoted as a cofounding factor for the surgical trauma and the subsequent complications.⁸⁻¹⁰ However, in this study this cofounding factor has been eliminated with the

presence of a single operator and a narrow surgical window (18-21 minutes).

Several studies have been done in the past comparing the efficacy of various NSAIDS.^{11,12} Some studies have been done regarding the routes of administration of Piroxicam too.¹³ Ibuprofen, Paracetamol and Piroxicam have proved to be trustworthy NSAIDS. From the present study statistically, there is not a significant difference in trismus and swelling between the two groups on the 7th postop day as compared to the significant difference on the second day.

This could indicate that the initial inflammatory reaction is better managed by Piroxicam, in comparison to Ibuprofen-Paracetamol combination. However, this statistical statement cannot be validated scientifically because the parameters of pain and fever are not included in this study.

The ultimate aim of any post-operative medication in Oral and Maxillofacial Surgery is patient comfort and patient satisfaction.¹⁴ In this study, Piroxicam showed better results statistically on the immediate post-op days. Additionally, it showed better GI tolerance compared to Ibuprofen Paracetamol. Also, the ease of use (single daily dose) of Piroxicam might ensure better patient compliance.

CONCLUSION

Piroxicam comes equivalent in comparison with the Ibuprofen-Paracetamol combination for lower third molar surgery, however the immediate post-op benefit of the Piroxicam cannot be overlooked.

REFERENCES

1. Colorado-Bonnin M, Valmaseda-Castellon E, Berini-Aytes L, Gay-Escoda C. Quality of life following lower third molar removal. *Int J Oral Maxillofac Surg.* 2006;35(4):343-7.
2. Nageshwar. Comma incision for impacted mandibular third molar. *J Oral Maxillofac Surg.* 2002;60:1506-9.
3. AuAH, Choi SW, Cheung CW, Leung YY. The Efficacy and Clinical Safety of Various Analgesic Combinations for Postoperative pain relief after Third Molar Surgery: A Systematic Review and Meta-Analysis. *PLoS One.* 2015;10(6):e0127611.
4. Brodgen RN, Heel RC, Speight TM, Avery GS. Piroxicam: A review of its pharmacological properties and therapeutic efficacy. *Drugs.* 1984;28:293-323.
5. Shetty S, Shenoy N, Shenoy K A, Unnikrishnan B, Mogra S. Comparison of effects of preoperative Piroxicam and Ibuprofen on pain after separator placement: A randomized controlled trial. *J Orthod Res.* 2013;1:57-61.
6. Sandhu A, Sandhu S, Kaur T: Comparison of two different flap designs in the surgical removal of bilateral impacted mandibular third molars. *Int J Oral Maxillofac Surg.* 2010; 39:1091-6.
7. Sisk Allen L, Hammer Wade B, Shelton David W, Joy ED Jr. Complications following removal of impacted third molars: The role of the experience of the surgeon. *J Oral Maxillofac Surg.* 1986;44:855-9.
8. Westcott K, Irvine GH. Appropriateness of referrals for removal of wisdom teeth. *Br J Oral Maxillofac Surg.* 2002;40(4):304-6.
9. Hersh EV, Cooper S, Betts N, Wedell D, MacAfee K, Quinn P, et al. Single dose and multimode analgesic study of Ibuprofen and meclufenamate sodium after third molar surgery. *Oral Surg Oral Med Oral Pathol.* 1993;76:680-7.
10. Daniels SE, Desjardins PJ, Talwalker S, Recker DP, Verburg KM. The analgesic efficacy of valdecoxib vs. oxycodone/acetaminophen after oral surgery. *J Am Dent Assoc.* 2002;133:611-21
11. Mohammad S, Singh V, Wadhvani P, Tayade HP, Rathod OK. Sublingual Piroxicam in the management of postoperative pain after surgical removal of impacted mandibular third molar. *Indian J Dent Res.* 2012;23:839-40
12. Trindade PA, Giglio FP, Colombini-Ishikiriama BL, Calvo AM, Modena KC, Ribeiro DA, et al. Sublingual ketorolac and sublingual Piroxicam are equally effective for postoperative pain, trismus, and swelling management in lower third molar removal. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2012;114(1):27-34.
13. Desjardins PJ. Patient Pain and Anxiety: The Medical and Psychologic Challenges Facing Oral and Maxillofacial Surgery. *J Oral Maxillofac Surg.* 2000;58(2):1-3.
14. Jung YS, Kim DK, Kim MK, Kim HJ, Cha IH, Lee EW. Onset of Analgesia and Analgesic Efficacy of Tramadol/ Acetaminophen and Codeine/Acetaminophen/Ibuprofen Acute Postoperative Pain: A Single- Center, Single- Dose, Randomized, Active-controlled, Parallel-Group Study in Dental Surgery Pain Model. *Clin Therap.* 2004;26:1037-45.