Efficacy of preemptive lornoxicam on postoperative analgesia after surgical removal of mandibular third molars

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Objective. Pain is the most encountered complication following third molar surgery. Although nonsteroidal anti-inflammatory drugs are often used for pain control, the effect of preemptive lornoxicam has not been detailed. We compare the analgesic efficacy of preemptive lornoxicam versus postoperative lornoxicam.
Study Design. Forty-three participants aged 18 to 33 years who had bilateral, symmetrical third molars were included in this double-blind, randomized, placebo-controlled study. All participants took part in each of the 2 groups for a 1-month interval (crossover design). Group Pre received lornoxicam 8 mg intravenously 25 minutes before surgery and 2 mL serum saline postoperatively. Group Post was given the opposite protocol. Pain was evaluated by visual analog scale in the first 12 hours.
Results. We observed statistically significant differences in the reduction of the pain level in group Pre ($P < .05$). These participants felt less pain in the first 5 postoperative hours and needed fewer analgesics in the first 12 postoperative hours.
Conclusions. Preemptive lornoxicam is effective for postoperative pain control. (Oral Surg Oral Med Oral Pathol Oral Radiol 2014;117:27-31)

The removal of impacted third molars is the most common oral surgical procedure after simple tooth extraction.[1,2] To assess the moderate to severe levels of pain after removal of the lower third molars is a common subject of acute pain trials.[2-4] Most patients require analgesic medication after the procedure, usually nonsteroidal anti-inflammatory drugs (NSAIDs) or acetaminophen.[5] Preemptive analgesia involves the treatment that prevents the establishment of central sensitization and the development of hyperexcitability from preoperative noxious stimuli.[6] However, the role of preemptive analgesia in preventing postoperative pain is still controversial. A number of experimental and clinical studies with various kinds of analgesics and other medications have found that preemptive analgesia may prevent postoperative pain.[6-10] In contrast to such findings, some clinical trials have found no preemptive effect for many analgesic agents. Methodologic deficiencies and the timing of preemptive analgesic administration may explain these differences.[11-13] Lornoxicam, belonging to the oxicam group of NSAIDs, is found to possess potent anti-inflammatory and analgesic activities. Lornoxicam is widely recommended for the symptomatic treatment of pain and inflammation in patients with osteoarthritis and rheumatoid arthritis, as well as preoperative and postoperative pain associated with gynecologic, orthopedic, abdominal, and dental surgeries. As lornoxicam shows a half-life of 3 to 5 hours and poor solubility in acidic conditions, it has been found to be an ideal candidate for floating sustained-release dosage forms.[14-17] Lornoxicam has also revealed good clinical efficacy in the treatment of postoperative pain.[18,19] However, there is little evidence regarding its administration as a preemptive analgesic agent for postoperative pain management. Moreover, there is a lack of data in the literature regarding the preemptive analgesic effect of lornoxicam in patients undergoing lower third molar surgery.[20]

The aim of this study was to assess the analgesic efficacy of lornoxicam either preoperatively or postoperatively for patients who underwent surgical removal of the lower third molars under local anesthesia.

MATERIALS AND METHODS

The ethics review committee of the Gazi University Faculty of Dentistry approved this study before the study began. The protocol was in compliance with the

Statement of Clinical Relevance

We reported that lornoxicam can be used safely because of its high analgesic efficacy and low adverse effects for postoperative pain control after third molar surgery. We use lornoxicam routinely for postoperative pain control.

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Helsinki Declaration, and each participant in the study signed a detailed informed consent form. After the written informed consent was obtained, 43 participants (14 men, 29 women; aged 18 to 33 years) requiring bilateral and symmetrical lower third molar surgery were included in this double-blind study. Patients with endocrine disorders, severe hepatic and renal diseases, neuropathies, bleeding disorders, preexisting gastric ulcers, gastritis, a history of gastrointestinal bleeding, dementia, cooperation disability, and sensitivity to lornoxicam were excluded. Participants were randomly selected, and all of them were assigned to 1 of 2 groups.

Group Pre

Lornoxicam 8 mg intravenous (IV) (Xefo; Abdi Ibrahim, Istanbul, Turkey; 8 mg ampule) was administered to the participants 25 minutes before surgery, and 2 mL IV serum saline was administered as a placebo after wound closure.

Group Post

Serum saline 2 mL IV as a placebo was administered to the participants 25 minutes before surgery, and 8 mg IV lornoxicam was administered after wound closure.

Both lornoxicam and saline syringes were covered with black paper for the double-blind study design. The same examiner, who was blinded to the group assignments, evaluated all the participants. The local anesthesia of the nervus alveolaris inferior was provided with 2.5% articaine hydrochloride (Ultracain DS; Aventis, Istanbul, Turkey). To prevent confounding effects, long-acting agents were not used. All surgical removals were performed by the same surgeon, thus providing calibration of the techniques and avoiding confounding discrepancies. The surgical procedure time, the amount of the local anesthetic solution, and the complications due to the surgical procedure or analgesics were recorded. Participants were recalled for follow-up at the first and seventh postoperative days. The same participant was appointed for the other third molar 1 month later, and the opposite protocol (opposite that of the first surgical procedure) was applied. Pain scores were evaluated with a 10-cm visual analog scale (VAS). Participants were instructed in the use of the VAS (0 = no pain to 10 = maximum pain) before surgery. Pain assessments were recorded hourly for the severity of pain in the first 12 postoperative hours, and data were collected regarding the first analgesic requirement, the total amount of analgesic use in the first 5 postoperative days, and the participants' level of satisfaction. Paracetamol was administered to the participants as a rescue analgesic. Participants' satisfaction levels for pain control were measured with 5-point Likert scales as very poor, poor, barely acceptable, good, or very good.[21]

Table I. Operation time (minutes) [mean ± SD (min-max)], amount of the anesthetic solution articaine hydrochloride (mL) [mean ± SD (min-max)], and complications [(n (%)]

	Group Pre (n = 43)	*Group Post (n = 43)*	*P**
Operation time (minutes) mean ± SD (min-max)	14.61 ± 5.61 (7-36)	16.44 ± 10.61 (5-62)	.333
Amount of the anesthetic solution (articaine hydrochloride) (mL) mean ± SD (min-max)	2.01 ± 0.26 (1.5-3)	1.99 ± 0.23 (5-62)	.659
Complications, n (%) Procedure-related			
Syncopal episode	0 (0)	1 (2.3)	.500
Root fracture	0 (0)	2 (4.7)	.494

SD, standard deviation.
*$P > .05$; compared with group Post.

Statistical analyses were performed with SPSS software (version 12; SPSS Inc, Chicago, IL, USA). Data were expressed as mean ± standard deviation (SD), median and number of participants (25%-75%), min-max, n (%). A value of $P < .05$ was considered as significant.

A Kolmogorov-Smirnov test was used for measured values for determination of whether the distribution was normal or abnormal. For normally distributed differences, comparisons between groups used the independent-groups Student *t* test, and a Mann-Whitney U test was used for abnormally distributed values. Paired *t* test to compare with the measured values between groups of data within group were used. Demographic variables were analyzed with a χ^2 test or with a Fisher exact test when appropriate.

RESULTS

Participants were assigned to the 2 groups randomly, as age (mean, 21.80 years; standard deviation, 3.32 years), gender (male-to-female ratio, 14:29), and American Society of Anesthesiologists physical status class (I-to-II ratio, 30:13) were all the same. No statistical differences were observed in anesthesia, surgical procedure periods, and amount of anesthetic solution between the 2 groups ($P > .05$; Table I). However, statistically significant differences were detected in VAS scores between the groups ($P < .05$; Figure 1). It was determined that participants in group Pre felt less pain at the fifth postoperative hour and needed fewer analgesics in the first 12 postoperative hours. It was also detected that the time until first required analgesic after the surgical procedure was much longer in group Pre, and there was a statistical difference between the 2 groups (Table II). It was confirmed that the satisfaction of the participants in the