ORIGINAL CONTRIBUTION

Rhinology, 46, 289-291, 2008

Comparison of levo-bupivacaine and lidocaine for postoperative analgesia following septoplasty*

Yavuz Fuat Yilmaz, Samet Ozlugedik, Ali Titiz, Anil Tuncay, Muge Ozcan, Adnan Unal

Ankara Numune Education and Research Hospital ENT Department, Ankara, Turkey

SUMMARY

The aim of this study is to compare the efficacy of levo-bupivacaine, a long-acting local anesthetic and lidocaine in postoperative analgesia following septoplasty. .

112 patients randomized into two groups were included in the study. 56 patients were operated using levo-bupivacaine and 56 using lidocaine as the local anesthetic. All patients were asked to mark their pain levels on a Visual analogue scale (VAS) at 1st, 2nd, 4th, 6th, 8th, 12th, and 24th hours postoperatively. In addition, the amount of analgesics used by each patient was recorded.

The results indicated that the VAS scores of the levo-bupivacaine patients were significantly lower within the postoperative 4 hours ($p < 0.05$) compared to the lidocaine group. In the levo-bupivacaine patients the earliest time for analgesic need was delayed ($p < 0.001$) and the total amount of analgesics used was significantly lower when compared to lidocaine group ($p < 0.001$).

In conclusion, levo-bupivacaine is effective for obtaining postoperative analgesia following septoplasty with local anesthesia. When compared to lidocaine, it increases the postoperative comfort of the patients by reducing pain levels.

Key words: septoplasty, local anesthesia, levo- bupivacaine, lidocaine, analgesia

INTRODUCTION

The comfort of the patient is very important during and after the operations in which local anesthetics are used. The most important complaint is postoperative pain. Septoplasty with local anesthesia is a common procedure in otolaryngology clinics. However, there are few studies on the reduction of postoperative pain after such operations.

Postoperative pain is a phenomenon associated with surgical trauma and expression of pain mediators [(1)]. After septoplasty, the maximum level of pain is usually experienced within the first 24 hours during which patients need analgesic support. Prevention of pain development within this period decreases the anxiety caused by the pain and thus prevents the creation of a vicious cycle [(2)].

Lidocaine is the most frequently used local anesthetic agent. Being a fast-acting agent, it cannot block the postoperative pain for a long time because of its short half-life. The chemical and pharmacological qualities of bupivacaine are similar to those of lidocaine. However, it starts acting in 2-10 minutes of application and it is effective for 7-8 hours. Thus, it provides 2-3 times longer analgesia than lidocaine does [(3)]. Levobupivacaine is the S enantiomer of bupivacaine. Despite having a similar level of efficacy as a local anesthetic, levo-bupivacaine has less cardiotoxic and neurotoxic potential than bupivacaine [(4)].

The postoperative pain of patients operated using levo-bupivacaine, a long-lasting local anesthetic, should start later than that of patients operated using lidocaine, and these patients should also require analgesic support later and need relatively lower amounts of analgesics. To substantiate this hypothesis, the levels of postoperative pain and need for postoperative analgesia of the patients who underwent septoplasty operation with levo-bupivacaine, a long-lasting anesthetic, and the patients who underwent septoplasty operation with lidocaine, a short-lived infiltrative anesthetic, were compared.

MATERIAL AND METHODS

Patients

The study involved 112 patients with nasal septum deviation that were scheduled for septoplasty under local anesthetic. The mean age of the patients was 39.7 years (range: 19-53 years). The approval of the Ethics Committee was obtained. All the patients'vital signs were monitored during the operation. The patients who had ECG changes, additional nasal pathologies and thus receiving additional surgical interventions, hypertension, asthma, diabetes mellitus, neurological diseases, and history of allergies to local anesthetics were excluded from the study.

*Received for publication: January 17, 2008; accepted: May 19, 2008

Anesthetics

Procedures other than septoplasty were not performed in any of the patients. Local anesthesia was achieved with levo-bupivacaine 0.5% in 56 patients who were randomly selected using a simple randomization method and lidocaine 2% in the remaining 56 patients. The local anesthetic was infiltrated into the nasal septum bilaterally in the submucoperichondrial- subperiosteal plane at multiple points. For premedication, dolantin1 mg/ kg and chlorphenoxamine 10 mg/kg were used. The patients did not know the type of the anesthetic agent used, however the surgeons were not blinded in the study.

To standardize the anesthetics used, it was ensured that both levo-bupivacaine and lidocaine contained 0.0125 mg/ml adrenaline. Ten minutes after infiltration with the anesthetic of choice, the operation started. At the end of the operation, the same type of merocel tampons was used in all the patients for nasal packing. No other perioperative analgesic medication was used.

Pain measurement

To determine the level of postoperative pain, a continuous 10-cm visual analog scale (VAS), was used. On the scale, 0 indicated 'no pain', and 10 indicated 'severe pain'. The patients were asked to mark their pain at different times on the scale, and the results were calculated and recorded in millimeters. The measurements were repeated at the 1^{st}, 2^{nd}, 4^{th}, 6^{th}, 8^{th}, 12^{th}, and 24^{th} hours.

At the times when the pain was the most severe, the patients were given 500 mg paracetamol p.o. and both timing and amount of analgesics used were recorded. The prescriber did not know the type of the anesthetic used.

Statistical analysis

The VAS scores and analgesic use of the levo-bupivacaine and lidocaine groups were statistically compared through Mann Whitney U test. A $p < 0.05$ was considered statistically significant. Bonferroni adjustment was used for multiple comparisons. The Bonferroni correction was applied for all possible inter-group comparisons within each measurement time. Because of the number of tests undertaken, the level of significance was set at 0.007.

RESULTS

The mean levels of levo-bupivacaine and lidocaine used on the patients were 8.6 ml and 9.2 ml respectively. No preoperative or postoperative complications developed in any of the patients.

The mean time for analgesic need of the patients in the postoperative period was 186.43 ± 91.04 minutes in the levo-bupivacaine group and 329.54 ± 135.82 minutes in the lidocaine group. The difference between the mean times of analgesic need of the two groups was statistically significant ($p < 0.001$).

The VAS scores for pain for the postoperative 1^{st}, 2^{nd} and 4^{th} hours in the levo-bupicaine group were statistically significantly lower than those of the lidocaine group ($p < 0.001$, $p < 0.005$, $p < 0.001$). Although the difference in VAS scores of the levo-bupivacaine group for the 6^{th}, 8^{th}, were statistically significant ($p = 0.028$, $p = 0.043$), the difference was not statistically significant after Bonferroni adjustment. The VAS score for postoperative 12^{th} hour was statistically not significant either ($p = 0.139$).

Intragroup comparisons of the groups for VAS scores of different hours indicated statistically significantly increased pain in the levo-bupivacaine group starting from the 6^{th} hour and in the lidocaine group, starting from the 2^{nd} hour compared to the 1^{st} hour scores of both groups ($p < 0.001$).

Comparison of the amounts of analgesics used by the patients showed that in the levo-bupivacaine group, the mean amount of analgesics used was 1.95 ± 1.01 tablet, while in the lidocaine group, it was 3.34 ± 1.10 tablet. The difference between the mean amounts of analgesics used by the two groups was statistically significant ($p < 0.001$).

DISCUSSION

Septoplasty under local anesthesia in adults is a routine procedure in otolaryngology clinics. Postoperative pain after surgical procedures with local anesthetics remains an important problem for many surgeons. Low level of postoperative pain will promote healing and thus increase the comfort of the patient as well as minimizing the amount of time off work. [5]. Analgesics and NSAIs are used frequently to reduce postoperative pain and inflammation. However, frequent use of these agents lead to complications such as gastrointestinal irritation, tendency to bleed, and allergic reactions, which may limit their use.

Following nasal surgery, pain is maximal within the first 24 hours, when patients often seek analgesics for pain relief. Disrupting the pain cycle within the first 6-8 hours by the use of long-lasting local anesthetics and reducing the amount of postoperatively used analgesics were the most important expectations in this study. Levo- bupivacaine has similar chemical properties to those of lidocaine. Although their onset of action times are similar, levo-bupivacaine's effect lasts 2-3 times longer than lidocaine [3].

Lower VAS scores within the first 4 hours in the levo-bupivacaine group confirmed this theoretical knowledge. After the 6^{th} hour, VAS scores of the levo-bupivacaine group were clinically lower than those of the lidocaine group. However, the difference was not statistically significant. On the other hand, the VAS scores of the levo-bupivacaine group remained lower at the end of the 24^{th} hour, which may suggest the capacity of levo-bupivacaine in disrupting the pain cycle.

The literature reveals few studies on long-lasting agents as an alternative to lidocaine. Nevertheless, no studies have been conducted to date to compare the duration of anesthesia and the amount of postoperative analgesics used after septoplasty using levo-bupivacaine, a safe and long-lasting anesthetic agent, with any other long-lasting anesthetic agent. Therefore, our study is the first to compare these properties of two anesthetic agents.

Friedman et al. [2] have compared levo-bupivacaine and lidocaine for postoperative pain after endoscopic sinus surgery. However, unlike our study, they did not detect any significant differences between the two groups. Similarly, Apostolopoulos et al. [6] compared the effects of ropivacaine, a long-lasting local anesthetic, and lidocaine in patients who underwent tonsillectomy and found that the patients who were given ropivacaine had longer postoperative anesthesia and thus, required lower amount of postoperative analgesics.

Because of the severity of pain within the first 6 hours postoperatively, patients seek analgesics for pain relief usually during this period. It was expected that disruption of the pain cycle with the use of long-lasting anesthetic agents would decrease the amount of analgesics used by the patients. The amount of analgesics taken by the levo-bupivacaine group was lower than the amount taken by the lidocaine group. This may be considered as an indication of a more comfortable postoperative period for the patients in the levo-bupivacaine group.

In conclusion, levo-bupivacaine is a safe and effective local anesthetic that reduces the postoperative pain and it may be local anesthetic of choice in septoplasty operations.

REFERENCES

1. Seymour RA, Walton JG. Pain control after third molar surgery. Int J Oral Surg 1984; 13: 457- 465.
2. Friedman M, Venkatesan TK, Lang D, Caldarelli DD. Bupivacaine for postoperative analgesia following endoscopic sinus surgery. Laryngoscope 1996; 106: 1382- 1385.
3. Schoem SR, Watkins GL, Kuhn JJ, Thompson DH. Control of early postoperative pain with bupivacaine in pediatric tonsillectomy. Ear Nose Throat J 1993; 72: 560- 563.
4. De Cosmo G, Mascia A, Clemente A, Congedo E, Aceto P. Use of levobupivacaine for the treatment of postoperative pain after thoracotomies. Minerva Anestesiol 2005; 71: 347- 351.
5. Jebeles JA, Reilly JS, Gutierrez JF, Bradley EL Jr, Kissin I. Tonsillectomy and adenoidectomy pain reduction by local bupivacaine infiltration in children. Int J Pediatr Otorhinolaryngol 1993; 25: 149- 154.
6. Apostolopoulos K, Labropoulou E, Samaan R, Bogris K. Ropivacaine compared to lidocaine for tonsillectomy under local anaesthesia. Eur Arch Otorhinolaryngol 2003; 260: 355- 357.

Yavuz Fuat Yilmaz, MD
Fatih stret 178/10 Kecioren
Ankara
Turkey

Tel: +90-(0-505)-764-7401
E-mail: yfyilmaz@gmail.com