

Original Research

Articaine versus Bupivacaine in impacted mandibular third molar tooth surgery

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ABSTRACT:

Background: Patient compliance and effective surgical procedure mandates complete pain control in order to gain patient cooperation and manage patient anxiety. The present study compared articaine and bupivacaine in impacted mandibular third molar tooth surgery. **Materials & Methods:** 50 patients selected for surgical extraction of impacted mandibular third molar of both genders were divided into 2 groups of 25 each. Group I received articaine and group II received bupivacaine. Parameters such as onset of action, duration, time of first rescue analgesic medication, difficulty of surgery, total amount (ml), intra-operative comfort and intra-operative bleeding was recorded. Postoperative pain intensity using visual analog scale (VAS) was recorded. **Results:** Group I had 12 males and 13 females and group II had 11 males and 14 females. The onset of action was 41.7 seconds in group I and 60.3 seconds in group II. Duration of surgery was 124.4 minutes in group I and 271.2 minutes in group II. Time of first rescue analgesic medication was 130.6 minutes in group I and 281.4 minutes in group II. Difficulty of surgery was 3.16 in group I and 3.21 in group II, total amount (ml) was 2.18 ml in group I and 2.76 ml in group II, intra-operative discomfort was 1.02 in group I and 1.42 in group II and intra-operative bleeding was 1.12 in group I and 1.30 in group II. The difference was significant ($P < 0.05$). **Conclusion:** In terms of intraoperative anaesthesia, Articaine outperformed bupivacaine in terms of clinical efficacy and achieved a faster beginning of anaesthetic activity.

Key words: Articaine, mandibular molar, bupivacaine

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INTRODUCTION

Impacted mandibular third molar tooth surgery, commonly known as wisdom tooth extraction, is a surgical procedure to remove one or more impacted wisdom teeth located at the back of the mouth. Wisdom teeth often become impacted due to lack of space or improper alignment, which can lead to various dental problems and discomfort.¹

Intraoperative trauma and the release of chemical mediators such as histamine, serotonin, quinine, and arachidonic acid cause postoperative pain. Short-acting local anaesthetics and nonsteroidal anti-inflammatory medications (NSAIDs) are usually used together to treat postoperative pain, but long-acting local anaesthetics can also be used to treat postoperative pain.²

Local anesthesia and pain management are the most important tenets in any oral surgical procedure. Patient compliance and effective surgical procedure mandates complete pain control in order to gain patient cooperation and manage patient anxiety.³ Pain perception depends upon the patient's pain threshold and quality of local anesthetics (LAs) used. LAs are believed to be the most frequently used drugs in clinical dentistry. It has been estimated that >300 million cartridges of LA are administered annually by dentists.⁴

Bupivacaine is a commonly used local anesthetic in dentistry, including for impacted mandibular third molar (wisdom tooth) surgery.⁵ It belongs to the amide class of local anesthetics and provides long-lasting pain relief by blocking nerve impulses in the

area where it is administered. When performing impacted mandibular third molar surgery, the oral surgeon typically numbs the surgical site to ensure the patient's comfort during the procedure.⁶ Bupivacaine is often chosen for this purpose due to its longer duration of action compared to other local anesthetics like lidocaine.⁷ The present study compared articaine and bupivacaine in impacted mandibular third molar tooth surgery.

MATERIALS & METHODS

The present study consisted of 50 patients selected for surgical extraction of impacted mandibular third molar of both genders. All agreed to participate in the study.

Data such as name, age, gender etc. was recorded. All were divided into 2 groups of 25 each. Group I received articaine (4% articaine with 1:100,000 epinephrine) and group II received bupivacaine (0.5% bupivacaine with 1:200,000 epinephrine). Parameters such as onset of action, duration, time of first rescue analgesic medication, difficulty of surgery, total amount (ml), intra-operative comfort and intra-operative bleeding was recorded. Postoperative pain intensity using visual analog scale (VAS) was recorded. Results were tabulated and assessed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I (25)	Group II (25)
Agent	4% articaine with 1:100,000 epinephrine	0.5% bupivacaine with 1:200,000 epinephrine
M:F	12:13	11:14

Table I shows that group I had 12 males and 13 females and group II had 11 males and 14 females.

Table II Comparison of parameters

Parameters	Group I	Group II	P value
Onset of action (s)	41.7	60.3	0.01
Duration of action (min)	124.4	271.2	0.02
Time of first rescue analgesic medication (min)	130.6	281.4	0.01
Difficulty of surgery	3.16	3.21	0.95
Total amount (ml)	2.18	2.76	0.05
Intra-operative discomfort	1.02	1.42	0.04
Intra-operative bleeding	1.12	1.30	0.92

Table II, group I shows that onset of action was 41.7 seconds in group I and 60.3 seconds in group II. Duration of surgery was 124.4 minutes in group I and 271.2 minutes in group II. Time of first rescue analgesic medication was 130.6 minutes in group I and 281.4 minutes in group II. Difficulty of surgery

was 3.16 in group I and 3.21 in group II, total amount was 2.18ml in group I and 2.76 ml in group II, intra-operative discomfort was 1.02 in group I and 1.42 in group II and intra-operative bleeding was 1.12 in group I and 1.30 in group II. The difference was significant (P< 0.05).

Graph I Comparison of parameters

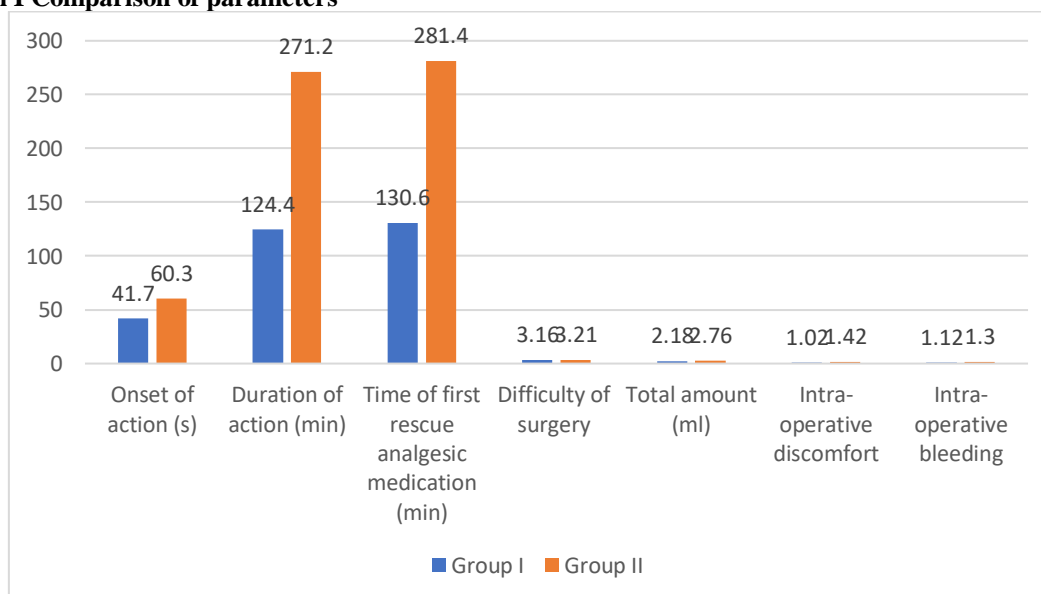


Table III Comparison of pain (VAS)

Duration	Group I	Group II	P value
Pre- operative	3.83	3.14	0.09
Post- operative	1.32	1.72	0.94

Table III shows that mean pre- operative VAS was 3.83 in group I and 3.14 in group II and post- operative VAS was 1.32 in group I and 1.72 in group II. The difference was non- significant ($P > 0.05$).

DISCUSSION

Numerous LA agents have been investigated and reported in the literature, but due to procaine's lengthy latency period and allergic reactions to ester anaesthetics, lidocaine, which Nils Lofgren synthesised in 1943, quickly rose to the top due to its few side effects and potent painkilling properties. Lidocaine's effectiveness and that of articaine and bupivacaine are comparable.^{8,9} A secure anaesthetic with a quick onset, suitable duration, and few side effects is articaine. When performing lengthy surgeries, bupivacaine is frequently used for analgesia and protracted postoperative pain management.¹⁰ The present study compared articaine and bupivacaine in impacted mandibular third molar tooth surgery.

We found that group I had 12 males and 13 females and group II had 11 males and 14 females. Gregorio et al¹¹ compared the clinical efficacy of 4% articaine and 0.5% bupivacaine, both with 1:200,000 epinephrine, for lower third molar removal in fifty patients. The time to onset of articaine (1.66 +/- 0.13 minutes) and bupivacaine (2.51 +/- 0.21 minutes) differed statistically significantly. However, compared to when they had gotten A200 (about 5 hours vs. 4 hours, $P .05$), individuals who had received B200 had a statistically significant longer period of anaesthesia on the soft tissues. For both anaesthetics, the surgeon rated the intraoperative bleeding as being very near to minimal. The comparison of both agents in the procedures involving osteotomies revealed statistically significant variations in the diastolic (64 mm).

We observed that the onset of action was 41.7 seconds in group I and 60.3 seconds in group II. Duration of surgery was 124.4 minutes in group I and 271.2 minutes in group II. Time of first rescue analgesic medication was 130.6 minutes in group I and 281.4 minutes in group II. Difficulty of surgery was 3.16 in group I and 3.21 in group II, total amount was 2.18 ml in group I and 2.76 ml in group II, intra- operative discomfort was 1.02 in group I and 1.42 in group II and intra- operative bleeding was 1.12 in group I and 1.30 in group II. Sancho et al¹² compared the anesthetic action of 0.5% bupivacaine in relation to 4% articaine, both with 1:200,000 epinephrine, in the surgical removal of lower third molars. Using 0.5% bupivacaine or 4% articaine, 18 patients had their bilaterally impacted lower third molars removed over the course of two sessions. Variables were recorded prior to, during, and after surgery. The latency periods and intraoperative efficacy of both treatments were comparable. Between the fifth and ninth postoperative hours, bupivacaine

was shown to significantly reduce pain levels. Soft tissue anaesthesia lasted substantially longer with bupivacaine. With articaine, systolic blood pressure and heart rate measurements were significantly higher.

CONCLUSION

Authors found that in terms of intraoperative anaesthesia, Articaine outperformed bupivacaine in terms of clinical efficacy and achieved a faster beginning of anaesthetic activity.

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