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ORIGINAL RESEARCH

Efficacy of 4% articaine and 2% lidocaine for buccal infiltration in cases of irreversible pulpitis

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ABSTRACT:

Background: Successful local anesthesia is the bedrock of pain control in endodontics. The present study was conducted to evaluate anesthetic efficacy of 4% articaine and 2% lidocaine for buccal infiltration in cases of irreversible pulpitis. **Materials & Methods:** The present study was conducted on 40 patients with irreversible pulpitis in maxillary first molar. Group I received 4% articaine with buccal infiltration and group II received 2% lidocaine with buccal infiltration. All subjects were asked to rate their pain on an HP VAS. Access preparation and pulp extirpation was determined in both groups. **Results:** It was found that initial pain score in group I was 2.38 and in group II was 2.98. Access preparation was successful in 74% in group I and 71% in group II. Pulp extirpation was successful in 68% in group I and 70% in group II. The difference was non-significant ($P > 0.05$). **Conclusion:** Both 4% articaine and 2% lidocaine found to be equally effective in initial pain score and in terms of efficacy access preparation and pulp extirpation.

Key words: Articaine, Lidocaine, Local anesthesia

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INTRODUCTION

Adequate local anesthesia is essential for successful patient management in endodontic therapy. Successful local anesthesia is the bedrock of pain control in endodontics. Effective pain control is essential to reduce fear and anxiety associated with endodontic procedures.¹ There is substantial research interest in finding safe and more effective local anesthetics for pulpal anesthesia. A range of local anesthetic drugs have been used in dentistry among which lidocaine is the most popular.² Articaine was introduced in April 2000 in the United States. Articaine, also classified as an amide anesthetic, has increased liposolubility and potency because of presence of a thiophene ring. According to some authors, its ability to diffuse can produce pulpal anesthesia in mandibular teeth after infiltration anesthesia.³ Lidocaine, the most frequently used local anesthetic, is the gold standard anesthetic agent used for comparison. It is an amide anesthetic with a short onset of action and an intermediate duration of anesthesia when associated with

adrenaline.⁴ Articaine, a safe local anesthetic, has a reputation of providing an improved local anesthetic effect. Several previous studies reported no significant difference in the anesthetic efficacy between 4% articaine and 2% lidocaine when used for primary inferior alveolar nerve block, intraligamentary injection, supplementary injection, or infiltration injection.⁵ The present study was conducted to evaluate anesthetic efficacy of 4% articaine and 2% lidocaine for buccal infiltration in cases of irreversible pulpitis.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. It comprised of 40 patients of both genders who had irreversible pulpitis in maxillary first molar. All were informed regarding the study. Ethical approval was obtained from institute prior to the study.

General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I

received 4% articaine with buccal infiltration and group II received 2% lidocaine with buccal infiltration. All subjects were asked to rate their pain on an HP VAS. Each subject was informed of the pain ratings on HP VAS and completed a baseline HP VAS to establish their preoperative pain level. The subjects placed a mark on the scale where it best described their pain level. VAS was divided into the following 4 categories: no pain corresponded to 0 mm on the scale; mild pain was defined

as >0 mm and <54 mm, which included descriptors of faint, weak, and mild pain; moderate pain was defined as >54 mm and <114 mm; severe pain was defined as 114 and included the descriptors of strong, intense, and maximum possible. Access preparation and pulp extirpation was determined in both groups. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Groups	Group I	Group II
Agent	4% articaine with buccal infiltration	2% lidocaine with buccal infiltration
Number	20	20

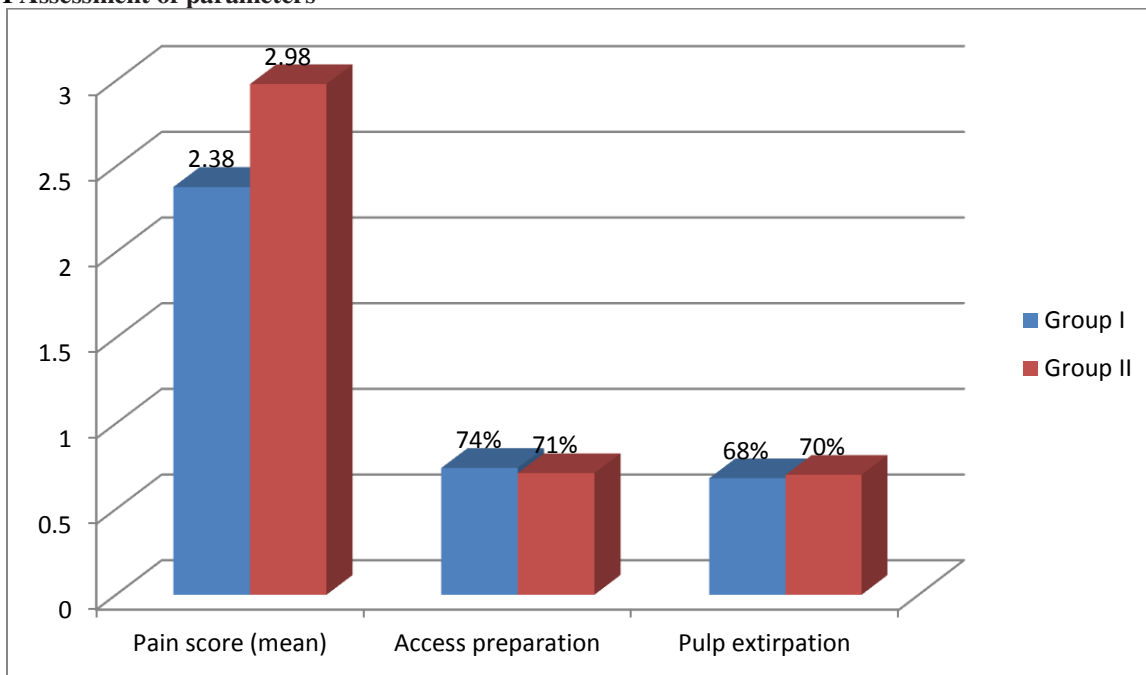
Table I shows that group I patients received 4% articaine with buccal infiltration and group II received 2% lidocaine with buccal infiltration. Each group had 20 patients each.

Table II Assessment of parameters

Parameters	Group I	Group II	P value
Pain score (mean)	2.38	2.98	0.5
Access preparation	74%	71%	0.3
Pulp extirpation	68%	70%	0.1

Table II, graph I shows that initial pain score in group I was 2.38 and in group II was 2.98. Access preparation was successful in 74% in group I and 71% in group II. Pulp extirpation was successful in 68% in group I and 70% in group II. The difference was non- significant (P> 0.05).

Graph I Assessment of parameters



DISCUSSION

Most of these studies investigated the efficacy of articaine in mandibular posteriors. Nevertheless, the anesthetic efficacy of articaine in providing pulpal anesthesia for maxillary posterior teeth with irreversible pulpitis needs further investigation.⁶

Articaine, which is 4-methyl-3-(2-[propylamino]propionamido)-2-thiophene carboxylic acid, methyl ester hydrochloride is the only amide local anesthetic that contains a thiophene ring and an additional ester ring. Lipid solubility is an intrinsic quality of local anesthetic potency. This quality permits the easier penetration of the anesthetic through the lipid nerve membrane and surrounding tissues. The degree of anesthetic molecules binding to the nerve membrane was suggested to dictate the duration of the anesthetic effect. The more secure a bond is, the slower the anesthetic is released from the receptor sites in the sodium channels, and the greater the duration of the anesthetic effect.⁷

It has been found that mere lipid solubility of a local anesthetic did not determine the action on the ionic channels. Binding properties of the local anesthetic agent to plasma proteins have a greater correlation to action on ionic channels than does lipid solubility. Available literature indicates that articaine is equally effective in nerve block and infiltration anesthetic techniques when compared with other local anesthetics including lidocaine with epinephrine, mepivacaine with epinephrine or with levonordefrin, mepivacaine with norepinephrine, and prilocaine with epinephrine.⁸ The present study was conducted to evaluate anesthetic efficacy of 4% articaine and 2% lidocaine for buccal infiltration in cases of irreversible pulpitis.

In present study, group I patients received 4% articaine with buccal infiltration and group II received 2% lidocaine with buccal infiltration. Each group had 20 patients each. Initial pain score in group I was 2.38 and in group II was 2.98. Access preparation was successful in 74% in group I and 71% in group II. Pulp extirpation was successful in 68% in group I and 70% in group II. Jung et al⁹ in their study found that the success rate for maxillary buccal infiltration to produce pulpal anesthesia using articaine was 100% in first premolar and first molar, and for the lidocaine solution, success rate was 80% in first premolar and 30% in first molar. There was high significant difference between the articaine and lidocaine solutions. Evans et al¹⁰ conducted a randomized double-blind trial to evaluate the anesthetic efficacy of 4% articaine with 1:100,000 epinephrine in inferior alveolar nerve block (IANB) and infiltration anesthetic techniques to anesthetize mandibular molars with irreversible pulpitis. They found that B Infil and IANB of 4% articaine were equally effective, B Infil can be considered a viable alternative in IANB for pulpal anesthesia in mandibular molars with irreversible pulpitis.

CONCLUSION

Both 4% articaine and 2% lidocaine found to be equally effective in initial pain score and in terms of efficacy access preparation and pulp extirpation.

REFERENCES

1. Martin M, Nusstein J, Drum M, Reader A, Beck M. Anesthetic efficacy of 1.8 mL versus 3.6 mL of 4% articaine with 1:100,000 epinephrine as a primary buccal infiltration of the mandibular first molar. *J Endod* 2011;37:588-92.
2. Nuzum FM, Drum M, Nusstein J, Reader A, Beck M. Anesthetic efficacy of articaine for combination labial plus lingual infiltrations versus labial infiltration in the mandibular lateral incisor. *J Endod* 2010;36:952-6.
3. Oertel R, Rahn R, Kirch W. Clinical pharmacokinetics of articaine. *Clin Pharmacokinet* 1997;33:417-25.
4. Raymond SA, Steffensen SC, Gugino LD, Strichartz GR. The role of length of nerve exposed to local anesthetics in impulse blocking action. *Anesth Analg* 1989;68:563-70.
5. Oertel R, Richter K, Weile K, Gramatte T, Berndt A, Feller K. A simple method for the determination of articaine and its metabolite articainic acid in dentistry: application to a comparison of articaine and lidocaine concentrations in alveolus blood. *Methods Find Exp Clin Pharmacol* 1993;15(8):541-7.
6. Tortamano IP, Siviero M, Costa CG, Buscariolo IA, Armonia PL. A comparison of the anesthetic efficacy of articaine and lidocaine in patients with irreversible pulpitis. *J Endod* 2009;35:165-8.
7. Borchard U, Drouin H. Articaine: action of the local anesthetic on myelinated nerve fibres. *Eur J Pharmacol* 1980;62:73-9.
8. Mikesell P, Nusstein J, Reader A, et al. A comparison of articaine and lidocaine for inferior alveolar nerve blocks. *J Endod* 2005;31:265-70.
9. Jung IY, Kim JH, Kim ES, Lee CY, Lee SJ. An Evaluation of buccal infiltrations and inferior alveolar nerve blocks in pulpal anesthesia for mandibular first molars. *J Endod* 2008;34:11-3.
10. Evans G, Nusstein J, Drum M, Reader AL, Beck M. A Prospective, randomized, double-blind comparison of articaine and lidocaine for maxillary infiltrations. *J Endod* 2008;34:389-93.