

Original Article

Comparison of Lignocaine for Dental Procedures with or without Bupivacaine: A Comparative Study

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ABSTRACT:

Background: Local anesthesia is the temporary loss of sensation or pain in one part of the body produced by a topically applied or injected agent without depressing the level of consciousness. Hence, we planned the present study to evaluate and compare the efficacy of lignocaine for dental procedures with or without bupivacaine. **Materials & methods:** We planned the present study to compare the efficacy of lignocaine for dental procedures with or without bupivacaine. A total of 60 patients scheduled to undergo dental extraction were included in the present study. All the patients were broadly divided into two broad study groups; Group A- Included patients who were given 2% Lidocaine with epinephrine, and Group B- Included patients who were given 2% lidocaine with epinephrine and 0.5% bupivacaine. Efficacy of the local anaesthetic solution was checked by pulp tester. The pulp tester displayed the output from a minimum of 0 to a maximum of 80. All the results were recorded and analysed by SPSS software. **Results:** Mean anaesthetic time for patients of group A and group B was 45.3 minutes and 68.3 minutes respectively. Significant results were obtained while comparing the mean anaesthetic time in between the two study groups. **Conclusion:** Lignocaine when used with bupivacaine has significantly longer duration of action in comparison to lignocaine alone.

Key words: Bupivacaine, Dental, Lignocaine.

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INTRODUCTION

Local anesthesia is the temporary loss of sensation or pain in one part of the body produced by a topically applied or injected agent without depressing the level of consciousness. Dental anesthetics fall into two groups: Esters (procaine, benzocaine) and amides (lidocaine, mepivacaine, bupivacaine, prilocaine and articaine). Esters are no longer used as injectable anesthetics. However benzocaine is used as a topical anesthetic. Amides are the most commonly used injectable anesthetics. Bupivacaine is one of the most common long-acting anesthetic agents used in maxillofacial surgery for more than past 30 years mainly to reduce the pain even after a surgical procedure is over. Several studies have been conducted regarding the toxicity and clinical safety of this agent compared to other local anesthetics. Lignocaine, on the other hand, is one of the safest short-acting local anesthetic agents being most commonly used in minor surgical procedures done in the chair side managements. Impacted third molar surgeries under local anesthesia are one of the most commonly

performed surgical procedure under local anesthesia. Hence, we planned the present study to evaluate and compare the efficacy of lignocaine for dental procedures with or without bupivacaine.

MATERIALS & METHODS

We planned the present study in the department of oral surgery of the dental institute and it included evaluation and comparison of efficacy of lignocaine for dental procedures with or without bupivacaine. We obtained written consent from all the patients after explaining in detail the entire research protocol. A total of 60 patients scheduled to undergo dental extraction were included in the present study. Inclusion criteria for the present study included:

- Patients scheduled to undergo dental extractions,
- Patients with negative history of any systemic illness,
- Patients with negative history of any haematological disorder,
- Patients with any known drug allergy

All the patients were broadly divided into two broad study groups;

Group A- Included patients who were given 2% Lidocaine with epinephrine, and

Group B- Included patients who were given 2% lidocaine with epinephrine and 0.5% bupivacaine

Efficacy of the local anaesthetic solution was checked by pulp tester. The pulp tester displayed the output from a minimum of 0 to a maximum of 80. All the results were recorded and analysed by SPSS software. Chi-square test was used for evaluation of level of significance. P- value of less than 0.05 was taken as significant.

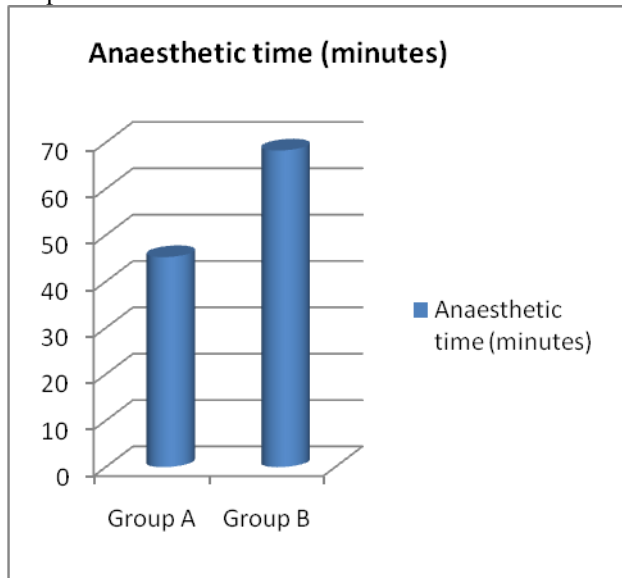
RESULTS

A total of 60 patients were included in the present study and were broadly divided into two study groups- group A and group B. Mean anaesthetic time for patients of group A and group B was 45.3 minutes and 68.3 minutes respectively. Significant results were obtained while comparing the mean anaesthetic time in between the two study groups.

Table 1: Comparison of both the anaesthetic solutions

Group	No. of patients	Onset time (min)	Anaesthetic time (min.)	P- value
A	30	3.6	45.3	0.02 (Significant)
B	30	5.8	68.3	

Graph 1: Anaesthetic time



DISCUSSION

In the present study, mean anaesthetic time for patients of group A and group B was 45.3 minutes and 68.3 minutes respectively. Significant results were obtained while comparing the mean anaesthetic time in between the two study groups. Jain NK et al evaluated the clinical efficacy of articaine over lidocaine in the surgical removal of impacted mandibular third molars. The objectives were to compare the onset of anesthesia, pain during injection, during the procedure and after the procedure, compare the duration of anesthesia, and need for re-anesthesia. A prospective study was conducted on 70 subjects planned

for surgical removal of mandibular third molars. Subjects were randomly administered one of two local anesthetics. The anesthetic agent used was unknown for the patient and the observer who performed the measurements. The differences in latency with 4% articaine (56.57 ± 9.8 s) and with 2% lignocaine (88.26 ± 12.87 s), pain during procedure for articaine 1.31 ± 0.87 and for lignocaine 2.60 ± 1.06, pain after procedure was 0.89 ± 0.58 for articaine and 1.31 ± 1.05 for lignocaine, and mean duration of anesthetic effect for articaine was 231 ± 57.15 min and 174.80 ± 37.02 min for lignocaine, which was statistically significant. For re-anesthesia, 6 out of 35 patients needed re-anesthesia at the frequency of 8.57% for articaine and 13 out of 35 patients needed re-anesthesia at a frequency of 18.57% for lignocaine. The results proved that articaine had a significant faster onset of action and longer duration of action when compared to lignocaine. Hence, the pain experienced by the patients during and after the surgical procedure was significantly less. The study was concluded that articaine is a safe alternative to lignocaine, which is potent and effective in minor surgical procedures such as removal of mandibular third molars.¹⁰

Mishra A et al conducted a study to find a suitable anesthetic combination for complicated and protracted minor oral surgical procedures. Fifty patients with bilaterally impacted deep-seated mandibular third molars were included in this study and randomly divided on the basis of anesthetic used into two groups. Group A received 2% lignocaine with 1:200,000 adrenaline while in group B, amalgamated mixture of 2% lignocaine and 0.5% bupivacaine was used. The onset time, duration of anesthetic effect, supplementary injections, pain (during local anesthetic deposition, intra and postoperatively), and postoperative analgesia were the study parameters. Chi-square and unpaired t tests were used to compare means. The onset time in both the groups was comparable and showed statistically significant difference between the duration of anesthetic effect with notable requirement of supplemental anesthetic injections in group A (54%) (p < 0.05). Pain scores also revealed a statistically significant intergroup difference (p < 0.05). Requirement of postoperative analgesics was delayed in group B. The amalgamated mixture of lignocaine and bupivacaine had equivocally rational onset and provided a more profound and in-depth anesthesia especially in complicated and protracted minor oral surgical procedures. Though this mixture is widely used in other surgical fields, its efficacy still remains unexploited and undocumented in oral and maxillofacial surgical procedures.¹¹Gao F et al studied twenty-five patients undergoing elective cataract day surgery, after receiving a dual-injection peribulbar block with a mixture consisting of equal volumes of 2% lignocaine and 0.75% bupivacaine with hyaluronidase. A maximum of 10 ml of solution was used for the initial block; supplementary injections of up to 10 ml were given to five patients. Venous blood was taken prior to the block and then 1, 10, 20, 30, 60 and 90 min after the block. The peak mean concentrations of lignocaine and bupivacaine were found at 10-20 min after injection when

no top-up was given and at 10 min after the top-up injection when required. All measured serum concentrations of lignocaine and bupivacaine were below the accepted toxic levels of the two drugs. However, the highest individual toxicity score after a top-up was 0.915 which was very close to the toxicity threshold (= 1) when a scoring system was used to assess the combined levels.¹²

CONCLUSION

Under the light of above mentioned data, the authors conclude that Lignocaine when used with bupivacaine has significantly longer duration of action in comparison to lignocaine alone. However; further studies are recommended.

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