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### Original Article

## Comparative Evaluation of Efficacy of two Different Anesthetic Solutions in Patients undergoing Dental Extractions

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#### ABSTRACT:

**Background:** Local anesthesia is an important part of the daily routines for a dentist. We planned the present study to assess and compare the efficacy of two different anesthetic solutions in patients undergoing dental extractions undergoing local anesthesia. **Materials & methods:** The present study included assessment and comparison of efficacy of two different anesthetic solutions in patients undergoing dental extractions undergoing local anesthesia. A total of 100 patients were included in the present study and were randomly divided into two study groups with 50 patients in each group as follows: Group A: Patients undergoing dental extraction under the local anesthetic effect of 2% lignocaine with 1:80000 concentrations of adrenaline, Group B: Patients undergoing dental extraction under the local anesthetic effect of 2% lignocaine with 1:200000 concentrations of adrenaline. Local anesthetic solution was administered to all the patients according to their respective group. All the patients were kept under observation after extraction to assess the presence of any postoperative complication. **Results:** Mean time for the objective onset of local anesthesia among the subjects of group A and group B was 3.20 minutes and 3.33 minutes respectively. Mean duration of anesthesia among subjects of group A and group B was 150.5 minutes and 140.8 minutes respectively. No significant results were obtained while comparing the onset and duration of LA among the subjects of the two study groups. **Conclusion:** Two percent lignocaine with two different concentrations had equal efficacy in patients undergoing dental extractions.

**Key words:** Anesthesia, Dental extraction, Efficacy.

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#### INTRODUCTION

Local anesthesia is an important part of the daily routines for a dentist. Vasodilator activity affects both the anesthetic potency and the duration. Greater vasodilator activity leads to increased blood flow to a region, which leads to a rapid removal of anesthetic molecules from the injection site. This drug class has an impressive history of safety and efficacy, but all local anesthetics have the potential to produce significant toxicity if used carelessly.<sup>1-3</sup> It is not unusual for patients to claim they are allergic to local anesthetics. Upon careful questioning, however, one generally finds that what they experienced was either a syncopal episode associated with the injection or cardiac palpitations attributed to epinephrine either contained in the solution or released endogenously. Although rare, reports of

allergic reactions to local anesthetics have appeared in scientific literature, but none of these have confirmed an IgE-mediated hypersensitivity reaction.<sup>4-6</sup> Adrenaline prolongs the duration as well as the depth of anesthesia. It is effective in preventing or minimizing blood loss during surgical procedures. The addition of epinephrine (adrenaline) to xylocaine increases the efficiency, duration of the analgesia, and reduces the risk of generalized toxicity. Xylocaine fulfills all the ideal requirements of local analgesic drugs. However, there are certain contraindications to the use of xylocaine in cases of cardiovascular diseases, hypertension, and hyperthyroidism, etc.<sup>7-9</sup>

Hence; we planned the present study to assess and compare the efficacy of two different anesthetic solutions in patients undergoing dental extractions undergoing local anesthesia.

**MATERIALS & METHODS**

The present study was carried out in the department of oral surgery of the dental institute and it included assessment and comparison of efficacy of two different anesthetic solutions in patients undergoing dental extractions undergoing local anesthesia. For the present study, written consent was obtained from all the patients before the starting of the study. A total of 100 patients were included in the present study and were randomly divided into two study groups with 50 patients in each group as follows:

- Group A: Patients undergoing dental extraction under the local anesthetic effect of 2% lignocaine with 1:80000 concentrations of adrenaline,
- Group B: Patients undergoing dental extraction under the local anesthetic effect of 2% lignocaine with 1:200000 concentrations of adrenaline.

Detailed clinical and medical history of all the patients was obtained and recorded. Patients with history of any other systemic illness or any known drug allergy were excluded from the present study. Local anesthetic solution was administered to all the patients according to their respective group. All the patients were kept under observation after extraction to assess the presence of any postoperative complication. All the results were recorded and analyzed by

SPSS software. Chi- square test was used for assessment of level of significance.

**RESULTS**

A total of 100 patients were included in the present study. All the patients were broadly divided into two study groups; Group A and Group B. Mean age of the patients of the group A and group B was 35.3 years and 38.1 years respectively. There were 28 males and 22 females in the group A while there were 26 males and 24 females in the group B. Mean time for the subjective onset of local anesthesia among the subjects of group A and group B was 1.86 minutes and 1.70 minutes respectively. Mean time for the objective onset of local anesthesia among the subjects of group A and group B was 3.20 minutes and 3.33 minutes respectively. Mean duration of anesthesia among subjects of group A and group B was 150.5 minutes and 140.8 minutes respectively. No significant results were obtained while comparing the onset and duration of LA among the subjects of the two study groups.

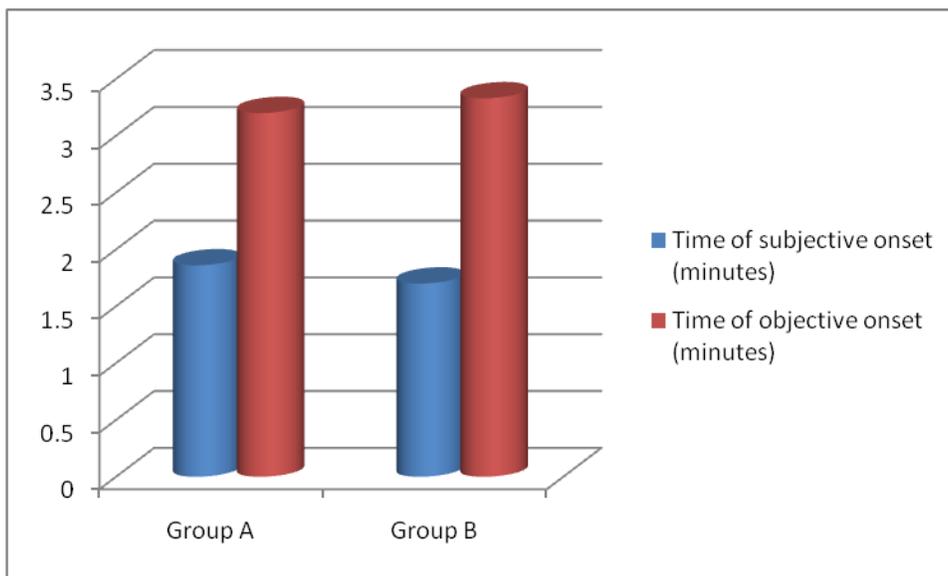
**Table 1:** Comparison of demographic details

| Parameter          | Group A | Group B |
|--------------------|---------|---------|
| Number of patients | 50      | 50      |
| Mean age (years)   | 35.3    | 38.1    |
| Males              | 28      | 26      |
| Females            | 22      | 24      |

**Table 2:** Comparison of time of onset and duration of Local anesthesia (LA)

| Parameter                          | Group A | Group B | P- value |
|------------------------------------|---------|---------|----------|
| Time of subjective onset (minutes) | 1.86    | 1.70    | 0.58     |
| Time of objective onset (minutes)  | 3.20    | 3.33    | 0.82     |
| Duration of anesthesia (minutes)   | 150.5   | 140.8   | 0.69     |

**Graph 1:** Time of onset of effect of LA



## DISCUSSION

In the present study, a total of 100 patients were included in the present study. All the patients were broadly divided into two study groups; Group A and Group B. Mean age of the patients of the group A and group B was 35.3 years and 38.1 years respectively. Managutti A et al compared the efficacy and cardiovascular effects with the use of 2% lignocaine with two different concentrations. Forty patients underwent extractions of mandibular bilateral teeth using 2% lignocaine with two different concentrations - one with 1:80000 and the other with 1:200000. There was no significant difference in the efficacy and duration with the 2% lignocaine with 2 different concentrations. 2% lignocaine with 1:80000 adrenaline concentration has significantly increased the heart rate and blood pressure especially systolic compared with the lignocaine with 1:200000. Though 2% lignocaine with 1:80000 is widely used in India, 1:200000 adrenaline concentrations do not much affect the cardiovascular parameters.<sup>10</sup>

In the present study, there were 28 males and 22 females in the group A while there were 26 males and 24 females in the group B. Mean time for the subjective onset of local anesthesia among the subjects of group A and group B was 1.86 minutes and 1.70 minutes respectively. Bansal V et al evaluated the efficacy, safety and clinical acceptability of the local anaesthetic agent ropivacaine 0.75 % in comparison with lignocaine 2 % with adrenaline 1:200,000 in minor oral surgical procedures. Forty-seven patients, who required bilateral extractions in a single arch, were included in this study. One hundred and sixty-six extractions were performed and all the patients were administered nerve blocks/infiltration. Pre and postoperative pulse, blood pressure, random blood sugar, electrocardiogram and partial oxygen pressure were recorded at specified time intervals. Pain score by visual analogue scale, onset of action and depth of anesthesia were also observed. Duration of anaesthesia was assessed by feeling of numbness and first sign of pain. Statistical analysis revealed insignificant difference between both the groups in terms of pulse, blood pressure, random blood sugar, and partial oxygen pressure. The depth of anesthesia was evaluated by pain, comfort during the procedure with visual analog scale and showed no significant difference between the two groups. The onset of action for maxillary infiltration was  $33.29 \pm 9.2$  (ropivacaine),  $32.12 \pm 6.8$  s (2 % lignocaine with adrenaline 1:200,000) and for pterygomandibular nerve block was  $181.0 \pm 87.5$  (ropivacaine),  $32.12 \pm 6.8$  s (2 % lignocaine with adrenaline 1:200,000). Duration of anesthesia when compared was  $411.7 \pm 66.11$  min (ropivacaine) and  $107.87 \pm 16.54$  (2 % lignocaine with adrenaline 1:200,000). On maxillary buccal vestibule infiltration it was also observed that in ropivacaine group there was no requirement of palatal infiltration suggestive of good diffusion property. Ropivacaine is a safe, clinically acceptable long acting

local anaesthetic agent with added advantage of effective diffusion property.<sup>11</sup>

In the present study, mean time for the objective onset of local anesthesia among the subjects of group A and group B was 3.20 minutes and 3.33 minutes respectively. Mean duration of anesthesia among subjects of group A and group B was 150.5 minutes and 140.8 minutes respectively. No significant results were obtained while comparing the onset and duration of LA among the subjects of the two study groups. Mansuri S et al compared the onset time, duration, depth and cardiovascular parameters between Centbutridine (0.5%) and Lignocaine (2%). The study was conducted in the dental outpatient department at the Government Dental College in India on patients attending for the extraction of lower molars. A total of 198 patients were included and there were no significant differences between the LAs except those who received Centbutridine reported a significantly longer duration of anesthesia compared to those who received Lignocaine. None of the patients reported any side effects. Centbutridine was well tolerated and its substantial duration of anesthesia could be attributed to its chemical compound. Centbutridine can be used for dental procedures and can confidently be used in patients who cannot tolerate Lignocaine or where adrenaline is contraindicated.<sup>12</sup>

## CONCLUSION

Under the light of above mentioned data, the authors conclude that 2 percent lignocaine with two different concentrations had equal efficacy in patients undergoing dental extractions. However; further studies are recommended.

## REFERENCES

1. Tofoli GR, Ramacciato JC, de Oliveira PC. Comparison of effectiveness of 4% articaine associated with 1: 100,000 or 1:200,000 epinephrine in inferior alveolar nerve block. *AnesthProg*. 2003;50:164-168.
2. Wahl MJ, Overton D, Howell J, Siegel E, Schmitt MM, Muldoon M. Pain on injection of prilocaine plain vs. lidocaine with epinephrine. A prospective double-blind study. *J Am Dent Assoc*. 2001;132:1396-1401.
3. Hersh EV, Hermann DG, Lamp CJ, Johnson PD, MacAfee KA. Assessing the duration of mandibular soft tissue anesthesia. *J Am Dent Assoc*. 1995;126(11):1531-6.
4. Gall H, Kaufmann R, Kalveram CM. Adverse reactions to local anesthetics: analysis of 197 cases. *J Allergy ClinImmunol*. 1996;97:933-937.
5. Berkun Y, Ben-Zvi A, Levy Y, Galili D, Shalit M. Evaluation of adverse reactions to local anesthetics: experience with 236 patients. *Ann Allergy Asthma Immunol*. 2003;91:342-345.
6. Scott DB, Jebson PJR, Braid DP, et al. Factors affecting plasma levels of lignocaine and prilocaine. *Br J Anaesth*. 1972;44:1040-1049.
7. Hanvold KI, Vigen EC, Jorkjend L, Aass AM, Skoglund LA. Increase in volume of dental local anaesthetic solution while maintaining the tissue lidocaine and adrenaline

- concentration does not increase acute postoperative pain after gingivectomy. *Br J Oral Maxillofac Surg.* 2008;46(3):218–22.
8. Yagiela JA. Adverse drug interactions in dental practice: Interactions associated with vasoconstrictors. Part V of a series. *J Am Dent Assoc.* 1999;130(5):701–9.
  9. Haase A, Reader A, Nusstein J, Beck M, Drum M. Comparing anesthetic efficacy of articaine versus lidocaine as a supplemental buccal infiltration of the mandibular first molar after an inferior alveolar nerve block. *J Am Dent Assoc.* 2008;139(9):1228–35.
  10. Managutti A, Prakasam M, Puthanakar N, Menat S, Shah D, Patel H. Comparative Analysis of Local Anesthesia with 2 Different Concentrations of Adrenaline: A Randomized and Single Blind Study. *Journal of International Oral Health: JIOH.* 2015;7(3):24-27.
  11. Bansal V1, Kumar D2, Mowar A1, Bansal A1. Comparison of Ropivacaine 0.75 % and Lignocaine 2 % with 1:200,000 Adrenaline in Dental Extractions: Single Blind Clinical Trial. *J Maxillofac Oral Surg.* 2018 Jun;17(2):201-206. doi: 10.1007/s12663-016-0902-x. Epub 2016 Apr 20.
  12. Mansuri S1, Bhayat A, Omar E, Jarab F, Ahmed MS. A randomized controlled trail comparing the efficacy of 0.5% centbucridine to 2% lignocaine as local anesthetics in dental extractions. *Int J Dent.* 2011;2011:795047. doi: 10.1155/2011/795047. Epub 2011 Nov 22.

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