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Original Research

Assessment of efficacy of two different local anesthetic solutions in patients undergoing dental extractions

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ABSTRACT

Background: Painless tooth extraction using the local anesthetic agent is the requirement for the comfort of the patient. The present study was conducted to assess the efficacy of ropivacaine and lignocaine with adrenaline in dental extractions. **Materials & Methods:** The present study was conducted on 148 patients of both genders. Patients were divided into 2 groups of 74 each. Group I received 0.75% ropivacaine while group II received 2% lidocaine with 1:200,000 adrenaline. Pain on injection, onset of anesthesia, pain during the extraction and duration of anesthesia was assessed and compared in both groups. **Results:** Mean onset of anesthesia in group I was 7.02 minutes and in group II was 9.52 minutes. The difference was significant ($P < 0.05$). Duration of anesthesia in group I was 3.24 hours and in group II was 3.68 hours, Pain on injection was 0.94 and 1.28 in group I and II respectively. VAS during procedure was 1.84 in group I and 1.32 in group II. The difference was non-significant ($P > 0.05$). **Conclusion:** Both solutions found to be equally efficacious in dental extraction cases.

Key words: ropivacaine, lignocaine, Pain

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INTRODUCTION

Extraction is the most common minor oral surgical procedure in oral and maxillofacial surgery. Painless tooth extraction using the local anesthetic agent is the requirement for the comfort of the patient. Local anesthesia is an effective method of pain control since 1884. In dentistry, 2% lidocaine is most frequently used. However, lidocaine is short acting (vasodilator). To increase the depth and duration of anesthesia, epinephrine was added to lignocaine. Adding vasoconstrictor reduces the pH of the solution (acidic), rendering the injections uncomfortable to the patients. Hence, search for a long-acting local anesthetic agent with inherent vasoconstrictive property still endures.¹ When lignocaine and adrenaline are used in combination, they prevent pain transmission passing from the area of injection to the brain and so it numbs the surgical area.² This study signifies that painful procedures in oral and maxillofacial surgeries, such as minor surgical procedures or major surgeries,

can be performed easily without causing pain and discomfort to patients. The numbness will constantly wear off following the surgical procedure under local anesthesia. Ropivacaine was introduced in 1996 and was found suitable for peripheral nerve blocks in the medical field. Limited data are available concerning the dental use of ropivacaine.³ The present study was conducted to assess the efficacy of ropivacaine and lignocaine with adrenaline in dental extractions.

MATERIALS & METHODS

The present study was conducted in the department of Oral & Maxillofacial surgery Govt. Dental College Srinagar. It comprised of 148 patients of both genders. All were informed regarding the study and written consent was obtained. Data pertaining to patients such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 74 each. Group I received 0.75% ropivacaine while group II received 2% lidocaine with 1:200,000

adrenaline. Following this, all underwent dental extractions under aseptic conditions. Pain on injection, Onset of anesthesia, Pain during the extraction and Duration of anesthesia was assessed and compared 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 patients

Groups	Group I (0.75% ropivacaine)	Group II (2% lidocaine with 1:200,000 adrenaline)
Number	74	74

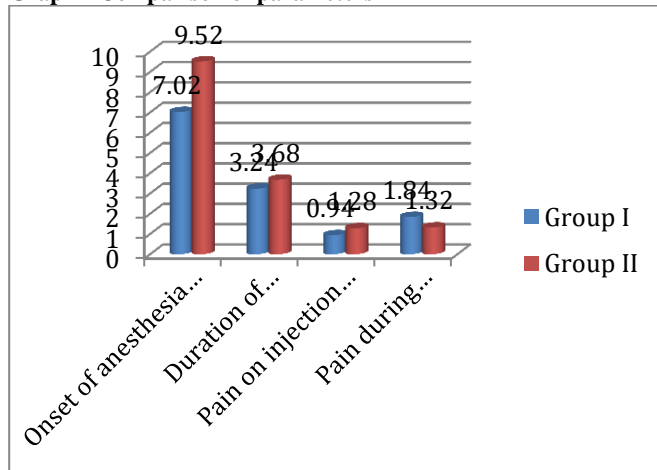
Table I shows that group I received 0.75% ropivacaine while group II received 2% lidocaine with 1:200,000 adrenaline.

Table II Comparison of parameters

Parameters	Group I	Group II	P value
Onset of anesthesia (mins)	7.02	9.52	0.01
Duration of anesthesia (hours)	3.24	3.68	0.51
Pain on injection (VAS)	0.94	1.28	0.42
Pain during procedure (VAS)	1.84	1.32	0.63

Table II shows that mean onset of anesthesia in group I was 7.02 minutes and in group II was 9.52 minutes. The difference was significant (P< 0.05). Duration of anesthesia in group I was 3.24 hours and in group II was 3.68 hours, Pain on injection was 0.94 and 1.28 in group I and II respectively. VAS during procedure was 1.84 in group I and 1.32 in group II. The difference was non-significant (P>0.05).

Graph I Comparison of parameters



DISCUSSION

The ideal tooth extraction is the painless removal of tooth or tooth root, with minimal trauma to the investing tissues. From time to time, multiple endeavors have been made to discover agents that eliminate pain during extraction. With the advent of local analgesic, it has become possible to achieve the relatively painless

extraction. Now, local analgesics are the most frequently used drugs in dentistry.⁴ Various local analgesic drugs have been discovered such as Cocaine (1884), Procaine (1905), and Lignocaine (1943). Xylocaine is one of the known proprietary names of lignocaine that produces an effective, efficient local anesthetic effect. Lignocaine is commonly used to anesthetize the mucosa and skin because of its rapid onset of action and long duration of sensory blockade. Lidocaine is known to have an onset < 2 min, a duration of 1 to 2 h, and a maximum dose of 5 mg/kg, which improves to an onset <2 min, a duration of 2 to 6 h, and toxicity of 7 mg/kg with the addition of epinephrine.⁵ Ropivacaine is a new aminoamide local anaesthetic. It is the monohydrate of the hydrochloride salt of 1- propyl-2,6-pipecoloxylidide and is prepared as the pure S-enantiomer. It is one of a group of local anaesthetic drugs, the pipecoloxylidides which were first synthesized in 1957.⁶ The present study was conducted to assess the efficacy of ropivacaine and lignocaine with adrenaline in dental extractions.

In present study, group I received 0.75% ropivacaine while group II received 2% lidocaine with 1:200,000 adrenaline. We observed that mean onset of anesthesia in group I was 7.02 minutes and in group II was 9.52 minutes. Duration of anesthesia in group I was 3.24 hours and in group II was 3.68 hours, Pain on injection was 0.94 and 1.28 in group I and II respectively. VAS during procedure was 1.84 in group I and 1.32 in group II.

Bhargava et al⁷ found that the mean onset of action for solution A (ropivacaine) was 7.15 ± 4.934 min and for solution B (lignocaine) was 9.75±5.128 min. This was statistically significant. The mean duration of action, pain on injection, and pain during extraction were not significant.

Ranjan et al⁸ found that the time of onset of analgesia, duration of analgesia, and depth of analgesia in the plain group ranged from 90 to 120 s, 55-65 min, and 55-65, respectively, with mean (±SD) of 104.30 ± 10.03 sec, 57.86 ± 9.15 min, and 40.86 ± 0.90, respectively, whereas in adrenaline group, it ranged from 80 to 110 s, 110-145 min, and 62-80, respectively, with mean (±SD) of 95.69 ± 9.56 s, 133.30 ± 8.93 min, and 73.57 ± 6.33, respectively. On comparing, t-test revealed significantly different and higher duration of analgesia and depth of analgesia in adrenaline group as compared to plain group. In contrast, mean time of onset of analgesia lowered significantly in adrenaline group as compared to plain group.

CONCLUSION

Both solutions found to be equally efficacious in dental extraction cases.

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