Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Article

Comparative Evaluation of efficacy of two different Anaesthetic Solutions in Patients undergoing Dental Extractions

Saurabh Shekhar[1], Ritesh Raj[2], Anuj Kumar[3], Kumari Vandana Choudhury[4], Shailesh Kumar Verma[5]

[1]Senior Resident, Department of Dentistry, Anugrah Narayan Magadh Medical College, Gaya, Bihar, India,
[2]Professor and Head, Department of Oral Surgery, Patna Dental College and Hospital, Patna, Bihar, India,
[3]Senior Lecturer, Department of Oral & Maxillofacial Surgery, Awadh Dental College and Hospital, Jamshedpur, Jharkhand, India,
[4]Department of Conservative Dentistry and Endodontics, Awadh Dental College and Hospital, Jamshedpur, Jharkhand, India,
[5]Head, Department of Dentistry, Anugrah Narayan Magadh Medical College, Gaya, Bihar, India

***ABSTRACT*:**
Background: The use of local anesthetics (LAs) in dentistry and other surgical procedures as a means of pain control has been one of the medical marvels of twentieth century.Hence; we planned the present study to evaluate the efficacy of two different anaesthetic solutions in patients undergoing dental extractions. **Materials & methods:** A total of 50 patients scheduled to undergo dental extractions were included in the present study. Group A- included patients who were given 2 percent lignocaine with 1:80000 concentration of adrenaline,Group B- included patients who were given 2 percent lignocaine with 1:200000 concentration of adrenaline.Visual analogue scale (VAS) was used for assessing the efficacy of both the anaesthetic solutions. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Non- significant results were obtained while comparing the mean duration of onset of the two anaesthetic solutions. Mean VAS score of the subjects of group A was 1.22 and of group B was 1.56. Non- significant results were obtained while comparing the mean VAS of the two study groups. **Conclusion:** Both the anaesthetic agents exhibit equal efficacy.
Key words: Adrenaline, Dental, Local anaesthesia.

Received: 12 June 2018 Revised: 13 July 2018 Accepted: 15 July 2018

Corresponding Author: Dr. Ritesh Raj, MDS, Professor and head, Department of Oral Surgery, Patna Dental College and Hospital, Patna, Bihar, India

This article may be cited as: Shekhar S, Raj R, Kumar A, Choudhury KV, Verma SK. Comparative Evaluation of efficacy of two different Anaesthetic Solutions in Patients undergoing Dental Extractions. J Adv Med Dent Scie Res 2018;6(9):122-124.

INTRODUCTION

The ability to provide the patient with clinically adequate pain control is one of the major concerns all over the world. The development of local anesthesia has marked the beginning of new era in the field of dentistry. The use of local anesthetics (LAs) in dentistry and other surgical procedures as a means of pain control has been one of the medical marvels of twentieth century.[1-3]
Lignocaine diffuses readily through interstitial tissues and lipid rich nerves, giving rapid onset of action. Its vasodilating effect is more than that of prilocaine and mepivacaine. Adrenaline prolongs the duration as well as the depth of anesthesia.[4-6]
Hence; we planned the present study to evaluate the efficacy of two different anaesthetic solutions in patients undergoing dental extractions.

MATERIALS & METHODS

The present study was conducted in the department of Dentistry. It included assessment and comparison of efficacy of two different anaesthetic solutions in patients undergoing dental extractions. Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire

research protocol. A total of 50 patients scheduled to undergo dental extractions were included in the present study. Exclusion criteria for the present study included:

- Patients with positive history of any systemic illness,
- Diabetic and hypertensive patients,
- Patient allergic to local anaesthetic solutions

After meeting the exclusion criteria, all the patients were broadly divided into two study groups;

Group A- included patients who were given 2 percent lignocaine with 1:80000 concentration of adrenaline,
Group B- included patients who were given 2 percent lignocaine with 1:200000 concentration of adrenaline.

Complete demographic details of all the subjects were obtained. Visual analogue scale (VAS) was used for assessing the efficacy of both the anaesthetic solutions.[7] All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi-square test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

A total of 50 patients scheduled to undergo dental extractions were included in the present study. All the patients were broadly divided into two study groups as group A and group B with twenty patients in each group. In the group A, 5 patients were less than 30 years of age, 8 patients were between 30 to 50 years of age and 12 patients were more than 50 years of age. Mean age of the patients of group A was 40.5 years. In the group B, 4 patients were less than 30 years of age, 7 patients were between 30 to 50 years of age and 14 patients were more than 50 years of age. Mean age of the patients of group A was 42.9 years. There were 18 males and 7 females in group A and 15 males and 10 females in group B. Mean duration of onset among subjects of group A and group B was 1.85 minutes and 1.76 minutes respectively. Mean duration of action of action among subjects of group A and group B was 155.6 minutes and 120.3 minutes respectively. Non- significant results were obtained while comparing the mean duration of onset of the two anaesthetic solutions. However; significant results were obtained while comparing the mean duration of action of the two solutions. Mean VAS score of the subjects of group A was 1.22 and of group B was 1.56. Non-significant results were obtained while comparing the mean VAS of the two study groups.

Table 1: Age-wise distribution of patients

Age group (years)	Group A	Group B
Less than 30	5	4
30 to 50	8	7
More than 50	12	14

Table 2: Gender-wise distribution of patients

Gender	Group A	Group B
Males	18	15
Females	7	10

Table 3: Comparison of data

Parameter	Group A	Group B	p- value
Mean duration of onset (min)	**1.85**	**1.76**	**0.22**
Mean duration of action (min)	**155.6**	**120.3**	**0.02***
Mean VAS	**1.22**	**1.56**	**0.08**

DISCUSSION

The first important task for a dentist or maxillofacial surgeon is to allow a patient to be comfortable and pain-free during minor surgical procedures and various other dental procedures under local anesthetics is an essential part of the dentistry. 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.[8, 9]

In the group A, 5 patients were less than 30 years of age, 8 patients were between 30 to 50 years of age and 12 patients were more than 50 years of age. Mean age of the patients of group A was 40.5 years. In the group B, 4 patients were less than 30 years of age, 7 patients were between 30 to 50 years of age and 14 patients were more than 50 years of age. Mean age of the patients of group A was 42.9 years. 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 ± 9.2 (ropivacaine), 32.12 ± 6.8 s (2 % lignocaine with adrenaline 1:200,000) and for pterygomandibular nerve block was 181.0 ± 87.5 (ropivacaine), 32.12 ± 6.8 s (2 % lignocaine with adrenaline 1:200,000). Duration of anesthesia when compared was 411.7 ± 66.11 min (ropivacaine) and 107.87 ± 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.[10]

In the present study, there were 18 males and 7 females in group A and 15 males and 10 females in group B. Mean duration of onset among subjects of group A and group B was 1.85 minutes and 1.76 minutes respectively. Mean duration of action of action among subjects of group A and group B was 155.6 minutes and 120.3 minutes respectively. Non- significant results were obtained while comparing the mean duration of onset of the two anaesthetic solutions. However; significant results were obtained while comparing the mean duration of action of the two solutions. Mean VAS score of the subjects of group A was 1.22 and of group B was 1.56. Non-significant results were obtained while comparing the mean VAS of the two study groups. Odor TM et al investigated the effects of inferior alveolar nerve block anaesthesia using 2% lignocaine with 1:100,000 or 1:80,000 adrenaline on pulpal blood flow in mandibular molar and canine teeth in 10 human subjects by laser Doppler flowmetry. The duration of pulpal anaesthesia in the teeth using electric pulp testing was also investigated. The injection of 2 ml of 2% lignocaine with 1:100,000 adrenaline caused a decrease in pulpal blood flow in both teeth in every subject. The mean pulpal blood flow in the canine tooth at 15 min was 58% of the baseline value whilst that in the molar was 76%. These values were not significantly different from the reduction in pulpal blood flow produced by 2% lignocaine with 1:80,000 adrenaline. Both solutions produced a reduction in blood flow that was of shorter duration than pulpal and soft tissue anaesthesia, and of shorter duration in the molar tooth compared with the canine. When 2% lignocaine with 1:100,000 adrenaline was injected, the mean reduction of blood flow was of shorter duration (canine, 60 min; molar, 42 min) than following 2% lignocaine with 1:80,000 adrenaline (canine, 93 min; molar, 72 min); these differences in reductions were statistically significant ($P < 0.05$). Using 2% lignocaine with 1:100,000 adrenaline, the mean duration of pulpal anaesthesia was 76 min in the canine tooth compared with 58 min in the molar tooth. Full soft tissue anaesthesia lasted for 117 min.[11]

CONCLUSION

Under the light of above obtained results, the authors conclude that both the anaesthetic agents exhibit equal efficacy. However; further studies are recommended.

REFERENCES

1. 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.
2. Elad S, Admon D, Kedmi M, Naveh E, Benzki E, Ayalon S, et al. The cardiovascular effect of local anesthesia with articaine plus 1: 200,000 adrenalin versus lidocaine plus 1: 100,000 adrenalin in medically compromised cardiac patients: A prospective, randomized, double blinded study. Oral Surg Oral Med Oral Pathol Oral RadiolEndod. 2008;105(6):725–30.
3. Kanaa MD, Whitworth JM, Corbett IP, Meechan JG. Articaine and lidocaine mandibular buccal infiltration anesthesia: A prospective randomized double-blind cross-over study. J Endod. 2006;32(4):296–8.
4. 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.
5. 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.
6. Dagher FB, Yared GM, Machtou P. An evaluation of 2% lidocaine with different concentrations of epinephrine for inferior alveolar nerve block. J Endod. 1997;23(3):178–80.
7. 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.
8. Malamed SF, Gagnon S, Leblanc D. Efficacy of articaine: A new amide local anesthetic. J Am Dent Assoc. 2000;131(5):635–42.
9. Gregorio LV, Giglio FP, Sakai VT, Modena KC, Colombini BL, Calvo AM, et al. A comparison of the clinical anesthetic efficacy of 4% articaine and 0.5% bupivacaine (both with 1: 200,000 epinephrine)for lower third molar removal. Oral Surg Oral Med Oral Pathol Oral RadiolEndod. 2008;106(1):19–28.
10. 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.
11. Odor TM1, Pitt Ford TR, McDonald F. Adrenaline in local anaesthesia: the effect of concentration on dental pulpal circulation and anaesthesia. Endod Dent Traumatol. 1994 Aug;10(4):167-73.

Source of support: Nil **Conflict of interest:** None declared