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 Research

Comparison of Anaesthetic Efficiency of lidocaine and Articaine in Third Molar Extraction

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ABSTRACT:

Background: Local anesthetics are effective and safe medicine that is used to prevent and manage pain. There is no other medicine that can be used to prevent pain or that can be used to prevent the propagation of the nociceptive stimuli reaching the CNS. The present study was conducted with the aim to determine and evaluate the anaesthetic efficacy of articaine and lidocaine in third molar extraction. **Materials and methods:** The randomised prospective study was done amongst 40 patients who reported to the Department of oral and maxillofacial surgery. Patients elder than 18 years of age were taken in the study. Subjects more than 55 years of age were not included in the study. Subjects with systemic co-morbidities like hypertension, diabetes, pregnant or lactating mothers, allergic to local anaesthesia were also not included in the study. Follow up was performed till 3 post operative days. All the data was arranged in a tabulated form and analysed using SPSS software. Chi square test was used for analysis. Probability value of less than 0.05 was regarded as significant. **Results:** The study included 40 subjects, out of which 25 were males and 15 females. The mean age of the subjects was 30.34 +/- 4.32 years. The mean onset in Group A was 57.21+/- 9.87 secs. The mean onset in Group B was 84.50+/- 10.68 secs. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. **Conclusion**: As per the study we can come to the conclusion that articaine is a better local anaesthetic than lignocaine.

Key words: Anaesthesia, Articaine, Lidocaine, Pain.

Received: 12 October 2018 Revised: 2 November 2018 Accepted: 5 November 2018

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This article may be cited as: Berwal V, Bansilal B, Kumar N, Kumar P, Kumar V, G Vinayak. Comparison of Anaesthetic Efficiency of lidocaine and Articaine in Third Molar Extraction. J Adv Med Dent Scie Res 2018;6(11):20-22.

INTRODUCTION

Local anesthetics are effective and safe medicine that is used to prevent and manage pain. There is no other medicine that can be used to prevent pain or that can be used to prevent the propogation of the nociceptive stimuli reaching the CNS.[1] Surgical removal of the impacted molars is one of the most frequently done oral surgical treatment. The mainstay for pain control during the interoperative time for different outpatient treatments is local anaesthetics. A. Einhorn in the year 1904 first produced local anaesthetic procaine and that widely used in dentistry and medicine. Nils Lofgren, later in 1943 synthesised the first amide local anaesthetic as lidocaine.[2] Lignocaine gained widespread esteem and became the gold standard for comparing and usage. It was Rusching and his colleagues who developed carticaine in the year 1969 and in the year 1976 at Germany its name was changed to articaine. Later in the years 1983 and 1998 it became widely popular at North America and United Kingdom respectively. Articaine is an intermediate acting local anaesthetic like lidocaine.[3]Articaine Hydrochloride chemically is 4-methyl-3-[1-oxo-2- (propylamino)-propionamido]-thiophene-carboxylic acid methyl ester hydrochloride is commonly used in the concentration of 4%.[4,5] The duration action of articaine is long compared to lidocaine as it has the presence of thiopentone ring and it has better diffusion into the tissues that leads to its longer duration of action. It is safe to be used amongst Children as stated by Malamed.[1]The present study was conducted with the aim to determine and evaluate the anaesthetic efficacy of articaine and lidocaine in third molar extraction.

MATERIALS AND METHODS

The randomised prospective study was done amongst 40patientswho reported to the Department of oral and maxillofacial surgery. All the subjects were informed about the study and a written consent was obtained from all in their vernacular language. Patients elder than 18 years of age were taken in the study. Subjects more than 55 years of age were not included in the

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study. Subjects with systemic co-morbidities like hypertension, diabetes, pregnant or lactating mothers, allergic to local anaesthesia were also not included in the study. All the subjects were informed not to take any pain killer 24 hours before the treatment. Under complete asepsis local anaesthesia was administered. The surgeon and the patient were blinded about the type of anaesthesia. Same operating technique and post operative drugs and instructions were given to all the subjects. The pain level amongst the subjects was noted using the visual analogue scale. The onset and duration of anaesthesia, duration of surgery and postoperative pain were taken in a predesigned proforma. Follow up was performed till 3 post operative days. All the data was arranged in a tabulated form and analysed using SPSS software. Chi square test was used for analysis. Probability value of less than 0.05 was regarded as significant.

RESULTS

The study included 40 subjects, out of which 25 were males and 15 females. The mean age of the subjects was 30.34 +/- 4.32 years.

Table 1 illustrates the mean onset of anaesthesia in both the groups. The mean onset in Group A was 57.21+/- 9.87 secs. The mean onset in Group B was 84.50+/- 10.68 secs. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups.

Table 2 illustrates the mean pain during administration of anaesthesia in both the groups. The mean pain in Group A was .97 +/-0.79. The mean pain in Group B was 1.23 +/-1.12. On applying chi square test the p value was more than 0.05 indicating no significant difference between the two groups.

Table 3 illustrates the mean pain during the procedure in both the groups. The mean pain in Group A was 1.39 +/-0.72. The mean pain in Group B was 2.74 +/-1.29. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups.

Table 4 illustrates the mean duration of in both the groups. The mean duration in Group A was 233 +/- 57.13 minutes. The mean duration in Group B was 190 +/-36.24. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups.

Table 1: Showing onset of anaesthesia

Group	Patients	Mean	Standard Deviation	P Value
Group (Articaine)	20	57.21	9.87	<0.05
Group (Lidocaine)	20	84.50	10.68	

Table 2: Showing pain during administration of anaesthesia

Group	Patients	Mean	Standard Deviation	P Value
Group A	20	0.97	0.79	>0.05
Group B	20	1.23	1.12	

Table 3: Showing pain during the procedure

Group	Patients	Mean	Standard Deviation	P Value
Group A	20	1.39	0.72	<0.05
Group B	20	2.74	1.29	

Table 4: Showing duration of anaesthesia

Group	Patients	Mean (Mins)	Standard Deviation	P Value
Group A	20	233	57.13	<0.05
Group B	20	190	36.24	

DISCUSSION

Articaine has an amide bond that undergoes biotransformation in the liver and that is actually a low process but its metabolism also occurs using the esterases in serum that is rapid process and occurs immediately after injection.[6] The VAS scales for pain scoring of is a consistent and generalised scale for evaluating pain.[7] Hence, it was used for estimation of scoring in our study. In the present study the mean onset of anaesthesia in both the groups. The mean onset in Group A was 57.21+/- 9.87 secs. The mean onset in Group B was 84.50+/- 10.68 secs. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. The mean pain during the procedure in both the groups. The mean pain in Group A was 1.39 +/-0.72. The mean pain in Group B was 2.74 +/-1.29. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. The ph of anaesthetic solution is 5.5, on addition of vasoconstrictor it decreases to 4.5. The alkaline nature of the anaesthetic provides a high potency and quick action. As per the study by Malamed, articaine was considered as a safer, effective and well tolerated technique of pain relief.[8] According to Vahatalo et al in the year 1993, no significant difference in the onset and duration of anaesthesia between articaine and lignocaine.[9] In our present study, the mean duration of in both the groups. The mean duration in Group A was 233 +/-57.13 minutes. The mean duration in Group B was 190 +/-36.24. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. According to Miyoshi et al on comparing the potency of four local anaesthetics, they found that articaine has a faster onset of action than lidocaine.[10]According to a study conducted by Costa et al they came to the conclusion that articaine has a shorter and faster onset of action.[11] As per Kalia et al found that articaine has a longer duration of anaesthesia as well as longer onset of anaesthesia when compared to 2% lidocaine.[12]According to Sree kumar and Bhagat et al, to evaluate the anesthetic efficacy of articaine and lignocaine for the transalveolar extraction of the impacted molar teeth, they found that, articaine had better anesthetic efficacy.[13] The concentration of articaine in the alveolus after tooth extraction was 100 times more than that present in systemic circulation. The chief action contributing to its duration of action is metabolism of articaine of its short systemic half-

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life.[14]As per the study, the duration of anesthesia by articaine at a amount of 1.8ml is 4.3 to 5.3 hours for nerve blocks.[15]

CONCLUSION

As per the study we can come to the conclusion that articaine is a better local anaesthetic than lignocaine. It has better pharmacokinetic and pharmacoynamic properties as compared to lidocaine. Articaine provides quick pain relief and may be regarded as a safer alternative to lidocaine for performing dental extraction.

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