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ORIGINAL RESEARCH

A HOSPITAL BASED STUDY COMAPRING THE ANAESTHETIC EFFICACY OF LIDOCAINE AND ARTICAINE IN THIRD MOLAR REMOVAL

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ABSTRACT:
Background: Surgical extraction of the impacted molars is the most performed oral surgical treatment. The mainstay for the pain control in the intraoperative time for a variety of outpatient management is local anaesthetics. The aim of the present study was to evaluate the anaesthetic efficacy of articaine and lidocaine in third molar removal. **Materials and methods**: The prospective study was done in 50 subjects that reported to District Early Intervention Centre, Nalanda Medical College & Hospital. Same technique and post operative instructions and post-operative drugs were given to all the patients. The pain level in the patients was noted with the visual analogue scale. The onset and duration of anaesthesia, duration of surgical procedure and postoperative pain was obtained in a predesigned proforma. Follow up was done for 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 mean onset in Group A was 57.13+/- 9.37 secs. The mean onset in Group B was 83.56+/- 10.58 secs. The mean duration in Group A was 234 +/-57.14 minutes. The mean duration in Group B was 191 +/-36.21. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. **Conclusion:** It can be concluded that articaine is has a better local anaesthetic action than lignocaine. Articaine enables a quick pain relief and could be regarded as a safer alternative to lidocaine for dental extraction.

Keywords: Anaesthesia, Articaine, Lidocaine, Pain

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INTRODUCTION

Local anaesthesia is an efficient and safe medicine for prevention and management of pain. No other medicament can be used for prevention of pain or that can prevent the propagation of nociceptive stimuli approaching the CNS.[1] Surgical extraction of the impacted third molar is the most commonly performed oral surgical treatments. The mainstay for the pain control in the intraoperative time for a variety of outpatient management is local anaesthetics. A. Einhorn in 1904 first invented local anaesthetic procaine and that commonly used in dentistry and medicine. Nils Lofgren, later in the year 1943 produced the first amide local anaesthetic named lidocaine.[2] Lignocaine attained widespread popularity and became the gold standard for comparison and usage. It was Rusching et al that developed Carticaine in 1969 and in 1976 in Germany its name was altered to Articaine. Later in 1983 and 1998 it became widely known at North America and United Kingdom respectively. Articaine is basically an intermediate acting anaesthetic like lidocaine.[3] Articaine Hydrochloride chemical name is 4-methyl-3-[1-oxo-2- (propylamino)-propionamido]-thiophene-carboxylic acid methyl ester hydrochloride is used in the level of 4%.[4,5] The duration of action of articaine is longer compared to lidocaine due to the presence of thiopentone ring and has better diffusion into tissues that lead to its longer action. The aim of the present study was to evaluate the anaesthetic efficacy of articaine and lidocaine in third molar removal.

MATERIALS AND METHODS

The prospective study was done in 50 subjects that reported to the District Early Intervention Centre, Nalanda Medical College and Hospital, Patna, Bihar. The study was approved by the institutional ethical committee board and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language.

Patients more than 18 years of age were enrolled in the study. Subjects elder than 55 years were not enrolled in the study. Patients with systemic co-morbidities like hypertension, pregnant or lactating females, diabetes, allergies were also excluded from the study. All the subjects were informed to avoid taking any pain killer 24 hours prior to the treatment. Under complete aseptic conditions, local anaesthesia was given. The operating surgeon and the subjects were blinded for the type of anaesthesia. Same technique and post operative instructions or drugs were given to all. The pain level in the patients was noted with the visual analogue scale. The onset and duration of anaesthesia, duration of surgical procedure and postoperative pain obtained in a predesigned proforma. Follow up was done for 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. Any complications arising out of the surgery was managed as per protocols. Trismus was a common complication in both the test groups and was managed by giving active Physiotherapy to the patients.

RESULTS

The study included 50 subjects, out of which 24 were males and 26 females. The mean age of the subjects was 26.32 +/- 4.25 years. Table 1 illustrates the mean onset of anaesthesia in both the groups. The mean onset in Group A was 57.13+/- 9.37 secs. The mean onset in Group B was 83.56+/- 10.58 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 .89 +/-0.74. The mean pain in Group B was 1.11 +/-1.08. 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 1.41 +/-0.71. The mean pain in Group B was 2.94 +/-1.13. 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 anaesthesia in both the groups. The mean duration in Group A was 234 +/-57.14 minutes. The mean duration in Group B was 191 +/-36.21. 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 A (Articaine)	25	57.13	9.37	<0.05
Group B (Lidocaine)	25	83.56	10.58	

Table 2: Showing pain during administration of anaesthesia

GROUP	PATIENTS	MEAN	STANDARD DEVIATION	P VALUE
Group A	25	0.89	0.74	>0.05
Group B	25	1.11	1.08	

Table 3: Showing pain during the procedure

GROUP	PATIENTS	MEAN	STANDARD DEVIATION	P VALUE
Group A	25	1.41	0.71	<0.05
Group B	25	2.94	1.13	

Table 4: Showing duration of anaesthesia

GROUP	PATIENTS	MEAN (mins)	STANDARD DEVIATION	P VALUE
Group A	25	234	57.14	<0.05
Group B	25	191	36.21	

DISCUSSION

Articaine is an amide derivative that normally undergoes biotransformation in liver and that is basically a slow process but it is also metabolised using the estrases in serum that is rapid occurrence and observed immediately after injection.[6] The VAS score for pain measurement is a generalised scale for evaluation of pain.[7] Hence, it was considered 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 57.13+/- 9.37 secs. The mean onset in Group B was 83.56+/- 10.58 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 in Group A was .89 +/-0.74. The mean pain in Group B was 1.11 +/-1.08. On applying chi square test, the p value was more than 0.05 indicating no significant difference between the two groups. The mean pain in Group A was 1.41 +/-0.71. The mean pain in Group B was 2.94 +/-1.13. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. The mean duration in Group A was 234 +/-57.14 minutes. The mean duration in Group B was 191 +/-36.21. On applying chi square test the p value was less than 0.05 indicating a significant difference between the two groups. The alkaline form of the anaesthetic gives a high potency and quick action. According to Malamed, articaine was

regarded as a safer, efficient and well tolerated drug of pain relief.[8] As per the study by Vahatalo et al in 1993, no significant difference in the onset and duration of anaesthesia amongst articaine and lignocaine.[9] As per Miyoshi et al when the potency of four local anaesthetics was compared, they found that articaine had a faster onset of action compared to lidocaine.[10] As per Costa et al articaine had a shorter and faster onset of action.[11] According to Kalia et al articaine had a longer duration of anaesthesia and longer onset when compared to 2% lidocaine.[12] As per Sree kumar and Bhagat et al, the anesthetic efficacy of articaine and lignocaine for surgical extraction of the impacted molar teeth, they concluded that, articaine had better anesthetic efficacy.[13] The prime action contributing to its duration is metabolism of articaine because of its short systemic half-life.[14] According to study, the duration of anesthesia by articaine at a amount of 1.8ml is 4.3 to 5.3 hours for nerve blocks.[15] The popular and easily available brand of Articaine available in India is Septanest from Septodont manufactured in France. One added advantage of this product over conventional Lignocaine is that it is supplied in cartridge form and thus does not contain any preservatives. Conventional Lignocaine vials available in India contains a preservative called Methyl Paraben and it is known for causing allergic reactions and in some rare cases, it can cause anaphylaxis too. Hence by using Articaine, the chances of any kind of allergy or anaphylaxis are also minimised.

CONCLUSION

It can be concluded that articaine has a better local anaesthetic action than lignocaine. It has better pharmacodynamic and pharmacokinetic variables as compared to lidocaine. Articaine enables a quick pain relief and could be regarded as a safer alternative to lidocaine for dental extraction.

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