

Assessment of Efficacy of Electronic Dental Anaesthesia with 2% Lignocaine In Patients Undergoing Dental Surgical Procedure: A Comparative Study

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ABSTRACT

Background: Fear and anxiety are most common issue faced by clinician during treatment of paediatric patient. Dental environment and especially injections increases the level of fear and anxiety. Administration of local anesthesia remains a herculean task for dentist thus the need of an alternative method was felt.

Aim: The aim of this study is to compare and assess the efficacy of electronic dental anaesthesia with 2% lignocaine in patients undergoing dental surgical procedure.

Materials and Methods: 120 patients were included in the present study. Age group selected for the present study was children aged between 4 to 12 years. Patients were divided in to two groups. 60 patients in each group, group 1 received 2% lignocaine and group 2 received electronic dental anesthesia. Visual analogue and verbal pain scale was used.

Results: In Visual Analogue Scale it was found that patients felt minimum pain in group 2 i.e. TENS (23.3%). In VPS 86.6% felt no pain in TENS group.

Conclusion: TENS can be used as an alternative method for administration of local anesthesia. It is efficient in controlling pain and is comfortable for patients.

Key words: Lignocaine, TENS, Paediatric Patient, Pain, Fear.

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INTRODUCTION

Local anesthesia is required for most of the procedures performed in dentistry like extractions, pulpomies, root canal treatment, drainage of abscess, etc. unpleasant stimulus like site of needle, drilling noise, equipment's leads to fear and anxiety among children. Pain control is very important part in paediatric patients. Some children have needle phobia and injecting such a child because completely impossible for dentist. Methods to control pain have been divided in two categories pharmacological and non-pharmacological methods.

Local anesthesia administration during dental procedure is considered to be the most common pharmacological means to reduce pain in dentistry followed by analgesics for the postoperative pain. Transcutaneous electrical nerve stimulation is the non-pharmacological method for pain control. TENS was first introduced in 1967 to help control chronic pain.^{1,2} Health professionals use TENS for acute and chronic pain management.^{3,4}

In spite of having potential to control pain its use it not very common in dentistry. So, we aimed to compare and assess the efficacy of electronic dental anaesthesia with 2% lignocaine in patients undergoing dental surgical procedure.

MATERIALS AND METHODS

A total of 120 patients were included in the present study. Age group selected for the present study was children aged between 4 to 12 years. Of the 120 patients 55 were males and 65 were females. Ethical committee clearance was obtained before initiating the study. A written informed consent was obtained from parents/guardians before starting the procedure. Patient's parents/guardians were explained in detailed regarding the procedure to be formed. Patients were divided in to two groups. 60 patients in each group, group 1 received 2% lignocaine and group 2 received electronic dental anesthesia. Visual analogue and verbal pain scale was used. Each group was further divided into subgroups

based on the patient's requirement of treatment. Endodontic procedures such as pulpotomy and pulpectomy, cavity preparation where caries extended were performed.

Group 1: 2% lignocaine; **Group 2:** Electronic dental anesthesia

Inclusion Criteria

1. Age group 4 to 12 years
2. Those in need of dental treatment
3. No history of LA allergy

Exclusion Criteria

1. Patients not willing to participate
2. Patients with mental disorders
3. Patients with chronic illness

Visual analogue scale was used, the child was asked to rate the discomfort VAS, with a smiling child at one end and a tearful child at the other. The distance along the scale from the smiling child was taken as the pain score. In addition, the child was asked which side was least painful. Verbal pain scale and Likert's scale for comfort and effectiveness of anesthesia was also used.

Data Analysis

Data was collected safely. Data so collected was subjected to analysis using Statistical Package for Social Sciences (SPSS) Version 15.0. Non parametric data has been represented as frequencies and percentages. All variables that were significantly different were recorded at a $p < 0.005$ level.

Table 1: Demographic characteristics of patients

Gender	Patients	Percentage
Male	55	45.8%
Female	65	54.1%
Total	120	100%

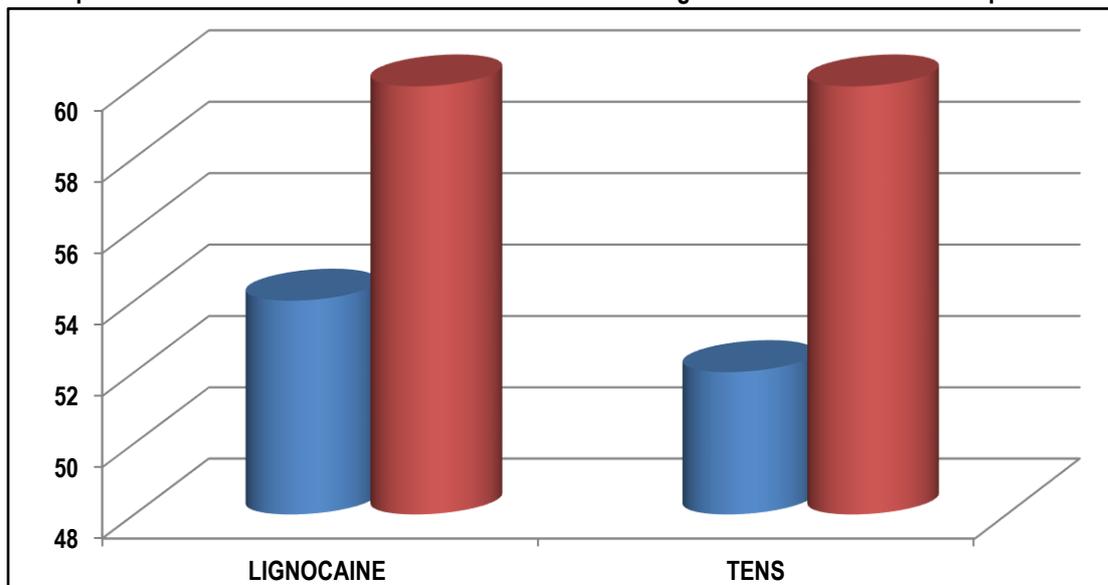
Table 2: Distribution of Group

Groups	Sample
Group 1- 2% lignocaine	60 (50%)
Group 2- TENS	60 (50%)

Table 3: Transcutaneous electric nerve stimulation and 2% lignocaine in relation to visual analogue scale

Groups	Patients	Percentage
Group 1	12	20%
Group 2	14	23.3%

Graph 1: Transcutaneous electric nerve stimulation and 2% lignocaine in relation to verbal pain scale



RESULTS

A total of 120 patients were included in the present study. Of the 120 55 were males i.e. 45.8% and 65 were females 54.1%. Age group selected for the present study was children aged between 4 to 12 years (Table 1). All 120 patients were divided in two groups. Group 1 consisted of 60 children, 2% lignocaine was used for all

60 patients. Group 2 consisted of 60 children, electronic dental anesthesia i.e. TENS (Table 2).

In Visual Analogue Scale showed that of the 60 patients in group 1, 12 patients reported minimum pain was felt with 2% lignocaine i.e. 20%, and 14/60 patients said they felt minimum pain in group

2 i.e. TENS i.e. 23.3% (Table 3). Of the 60 patients in lignocaine study 48 patients felt no pain i.e. 80%, 46/60 patients felt no pain in TENS group i.e. 76.6%. Minimum pain was felt in lignocaine group followed by TENS group (Table 3). In VPS, patients experienced minimum pain with 2% lignocaine, but the pain was comparable with the TENS group (graph 1). Of the 60 patients no pain was felt by 54 patients i.e. 90% in lignocaine group and 52 patients i.e. 86.6% felt no pain in TENS group. Results in present study showed that comfort and efficacy scale, Likert's scale, 2% lignocaine was most comfortable during various procedures, and was closely followed by TENS.

DISCUSSION

Pain is a complex reactions or response to the stimulus. It is an experience that includes not only the sensations evoked by tissue damaging or noxious stimuli but also reaction to each stimulus. Pain control is earlier days were completely impossible due to lack of anesthesia. Carl Koller in 1884 first demonstrated the effect of local anesthesia.⁵At present local anesthesia is most commonly used to control pain. Use of local anesthesia is very frequent in paediatric cases. However fear of needle has been frequently encountered in paediatric cases. Some authors have suggested that anxiety, psychological factors, local and systemic toxic reactions and paresthesia have been observed in patients receiving local anesthesia.⁶

Black RR in his study mentioned that TENS devices have been used to control the pain of trigeminal neuralgia or atypical facial pain, and to relieve muscle spasms in myofascial pain dysfunction.⁷ Malamed et al In their study, they reported a success rate of more than 80% for shallow and moderately deep restorations. The success rate for deep restorations was 60%.⁸ in present study 90% in lignocaine group and 52 patients i.e. 86.6% in TENS group felt no pain. Our results are in agreement with those reported by the authors.

Harvey and Elliot in their study reported a significant decrease in pain perception with EDA compared with a placebo inactive machine. The authors reported pain with EDA increased when deeper cavity excavation was necessary.⁹ however Abdulhameed SM et al inn their study found that there was significant increase in the pain threshold when EDA was used.¹⁰ No such findings were observed in our study we don't agree with the author. Katch in their study used TENS to control pain of TMJ syndrome in a 10-year-old girl and achieved 50-75% of pain relief.¹¹

CONCLUSION

TENS is non-invasive and safe to handle. Based on the result of present study we conclude that commonly associated with other anesthetic agents used. No side effect was observed in patients receiving TENS. TENS can be a useful adjunct to providing pain control during dental procedures in children.

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