

## ORIGINAL RESEARCH

# Evaluation of Two Topical Anesthetic Agents against Pain Associated with Intraoral Injections

Utsav Mukherjee

## ABSTRACT

**Objective:** The objective of the study was to study the rapidity of onset of action and to evaluate the efficacy of two topical anesthetic agents in reducing pain associated with intraoral injections.

**Methods:** Fifty health children between 6 and 12 years of age (mean age: 8.7 years) were selected for the study. Two topical anesthetic agents, lignocaine hydrochloride gel (Xylocaine 2% jelly AstraZeneca) and benzocaine 18% gel (Mucopain, Premier Dental Products Co.) were applied to bilateral maxillary molar vestibular area. Time of onset was measured with a blunt-ended instrument. Efficacy of the agents was measured using Modified Wong Baker's facial pain scale (FPS) and sound, eye, and motor scale (SEM).

**Results:** The average time of the application of benzocaine was  $76 \pm 10.37$  s, whereas for lidocaine, it was  $99 \pm 12.2$  s. The mean pain ratings were as follows: Lidocaine 2.6 and benzocaine 4.3 in the FPS. The mean pain ratings in the SEM scale were lidocaine 0.9 and benzocaine 1.7.

**Conclusions:** In spite of its slow onset of action, lignocaine 2% gel proved to be superior in pain reduction than benzocaine 18% gel with FPS and SEM scale.

**Keywords:** Anesthetic agents, Pain, Topical.

**How to cite this article:** Mukherjee U. Evaluation of Two Topical Anesthetic Agents against Pain Associated with Intraoral Injections. *Int J Prev Clin Dent Res* 2018;5(1):S103-104.

**Source of support:** Nil

**Conflicts of interest:** None

## INTRODUCTION

Painful treatment has been shown to be important in the etiology of dental fear. People who are hurt while receiving dental care as children are more likely to avoid dental care as adults.<sup>[1]</sup>

Effective pain control is critical in dentistry. In pediatric dentistry, it forms an important part of child behavior guidance and helps in positive acceptance

of dentistry by the child patient.<sup>[2]</sup> The fear of pain attributed to anesthetic needle injections is cited as an obstacle in providing appropriate dental care.<sup>[3]</sup> The use of a mechanical anesthetic delivery system is effective, but it has a slower anesthetic application time and higher cost of equipment than does an injection with a syringe.<sup>[4]</sup> Topical anesthetic is used routinely and widely to prepare the injection site and is recommended to decrease pain. Multiple studies have documented the effectiveness of intraoral topical anesthetics with different formulations and concentrations in reducing injection pain.<sup>[5-7]</sup> Various agents are available today for topical analgesia. While lignocaine serves as the gold standard,<sup>[8]</sup> benzocaine is also known for its excellent surface, anesthetic agents were used in this study. The aim of this study was to study the rapidity of onset of action and to evaluate the efficacy of two topical anesthetic agents in reducing pain associated with intraoral injections.

## MATERIALS AND METHODS

Fifty health children between 6 and 12 years of age (mean age: 8.7 years) were selected for the study. Two topical anesthetic agents, lignocaine hydrochloride gel (Xylocaine 2% jelly AstraZeneca) and benzocaine 18% gel (Mucopain, Premier Dental Products Co.) were applied to bilateral maxillary molar vestibular area. Time of onset was measured with a blunt-ended instrument. Efficacy of the agents was measured using Modified Wong Baker's facial pain scale (FPS) and sound, eye, and motor scale (SEM).

## RESULTS

The average time of the application of benzocaine was  $76 \pm 10.37$  s, whereas for lidocaine, it was  $99 \pm 12.2$  s. The mean pain ratings were as follows: Lidocaine 2.6 and benzocaine 4.3 in the FPS. The mean pain ratings in the SEM scale were lidocaine 0.9 and benzocaine 1.7.

## DISCUSSION

The FPS and its variations have proven to be useful in children over the ages of 6 or 7 years and reasonable validation data are available in this regard.<sup>[9]</sup> Hence, in the present study, children above 6 years of age

Reader

Department of Pedodontics and Preventive Dentistry, Awadh Dental College and Hospital, Jamshedpur, Jharkhand, India

**Corresponding Author:** Dr. Utsav Mukherjee, Reader, Department of Pedodontics and Preventive Dentistry, Awadh Dental College and Hospital, Jamshedpur, Jharkhand, India. e-mail: drutsav17@gmail.com

were chosen. SEM scale designed by Wright *et al.* was used as the observational scale as none of the existing observational scales are feasible for measuring pain in a dental situation.<sup>[10]</sup> In the present study, Xylocaine gel was found to be superior to benzocaine with regard to pain reduction. The mean FPS and SEM scores for xylocaine were significantly lower than that for benzocaine. A study conducted by Jasdev *et al.* found lignocaine gel to be clinically effective in reducing pain from needle insertion in 2 min.<sup>[11]</sup> In a study conducted by Rosa *et al.*, it was found that lidocaine and benzocaine were equally efficient in reducing pain caused by insertion of needles into palate, and both were better than placebo.<sup>[12]</sup> In another study, Kreider *et al.* found a statistically significant decrease in observed verbal indicators of injection pain when lidocaine patch was used compared to the application of topical benzocaine.<sup>[13]</sup>

## CONCLUSIONS

In spite of its slow onset of action, lignocaine 2% gel proved to be superior in pain reduction than benzocaine 18% gel with FPS and SEM scale. Further studies are required with improved formulations for routine use in dentistry.

## REFERENCES

- Berggren U, Meynert G. Dental fear and avoidance: Causes, symptoms, and consequences. *J Am Dent Assoc* 1984;109:247-51.
- Asarch T, Allen K, Petersen B, Beiraghi S. Efficacy of a computerized local anesthesia device in pediatric dentistry. *Pediatr Dent* 1999;21:421-4.
- Milgrom P, Coldwell SE, Getz T, Weinstein P, Ramsay DS. Four dimensions of fear of dental injections. *J Am Dent Assoc* 1997;128:756-66.
- Friedman MJ, Hochman MN. The AMSA injection: A new concept for local anesthesia of maxillary teeth using a computer-controlled injection system. *Quintessence Int* 1998;29:297-303.
- Rosivack RG, Koenigsberg SR, Maxwell KC. An analysis of the effectiveness of two topical anesthetics. *Anesth Prog* 1990;37:290-2.
- Hersh EV, Houpt MI, Cooper SA, Feldman RS, Wolff MS, Levin LM. Analgesic efficacy and safety of an intraoral lidocaine patch. *J Am Dent Assoc* 1996;127:1626-34.
- Meehan JG, Winter RA. A comparison of topical anaesthesia and electronic nerve stimulation for reducing the pain of intra-oral injections. *Br Dent J* 1996;181:333-5.
- Vickers ER, Punnia-Moorthy A. A clinical evaluation of three topical anaesthetic agents. *Aust Dent J* 1992;37:267-70.
- Champion GD, Goodenough B, Von Baeyer CL, Thomas W. Measurement of pain by self-report. In: Finley GA, McGrath PJ, editors. *Measurement of Pain in Infants and Children*. Seattle: IASP Press; 1998. p. 123-60.
- Wright GZ, Weinberger SJ, Marti R, Plotzke O. The effectiveness of infiltration anesthesia in the mandibular primary molar region. *Pediatr Dent* 1991;13:278-83.
- Bhalla J, Meehan JG, Lawrence HP, Grad HA, Haas DA. Effect of time on clinical efficacy of topical anesthesia. *Anesth Prog* 2009;56:36-41.12.
- Rosa AL, Sverzut CE, Xavier SP, Lavrador MA. Clinical effectiveness of lidocaine and benzocaine for topical anesthesia. *Anesth Prog* 1999;46:97-9.
- Kreider KA, Stratmann RG, Milano M, Agostini FG, Munsell M. Reducing children's injection pain: Lidocaine patches versus topical benzocaine gel. *Pediatr Dent* 2001;23:19-23.