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Review Article

Buzzy Technique And Vibrajet In Pain Management For Local Anaesthesia – A Literature Review

Preethi Arunachalam

Senior Lecturer, Department of Oral and Maxillofacial Surgery,Sri Ramakrishna Dental College and Hospital, Coimbatore, Tamil Nadu.

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Abstract

Growing evidence supports skin vibration (Vibro analgesia) as a potential technique for pain alleviation. Vibration, pinching, and applying pressure to the skin have long been accepted as ways of relieving the pain of local anesthetic infiltration. Cooling the skin has also long been believed to have analgesic benefits and some procedures are even carried out entirely using this method in place of an anesthetic injection. Buzzy (MMJ Labs, Atlanta, GE, USA) is a bee-shaped apparatus consisting of two parts: the body of a bee and detachable ice wings. The Buzzy device is primarily based on Melzack and Wall's (1965) gate control theory of pain and the descending inhibitory mechanism. This article reviews this device and its technique.

Keywords: *Buzzy technique, Vibrajet , Pain management, Local anesthesia*

Address for Correspondence:
Preethi Arunachalam , MDS
Senior Lecturer,
Department of Oral and Maxillofacial Surgery,
Sri Ramakrishna Dental College and Hospital,
Bus Stop, SNR College Road,
Nava India,
Peelamedu, Coimbatore,
Tamil Nadu 641006.
Email: mathupreethi.a@gmail.com
Mobile No: 9500555724

INTRODUCTION

Pain can be defined as an unpleasant sensory or emotional experience associated with actual or potential tissue damage or described in terms of such damage. Pain management plays a crucial role not just in the delivery of treatment, but also in the comfortable acceptance of the same [1]. This pain management characteristically involves the administration of local anesthetic agents which are mostly in injectable form using a needle and syringe. Injection of local anesthetic agents is one of the most important stimuli causing fear and anxiety in patients requiring dental treatment [2]. Dental anxiety reduces the probability of tolerating treatment and increases treatment duration. Several techniques are available to control pain during injection such as [3]:

- Topical agents
- Buffered local anesthesia solution
- Warming the LA agent
- Counter stimulation
- Slow rate of infiltration
- Pressure
- Cooling the injection site

MATERIALS AND METHODS

A total of 4 articles were shortlisted from the following search databases:

1) Pubmed
2) MEDLINE
3) Embase
4) Cochrane

The short-listed articles included the following [4-7]:

- Mohammed et al (2019) prospective study compared skin cooling and vibration and skin vibration. Effectiveness in pain reduction.
- Subhuman et al (2020) a comparative study between the conventional syringe and buzzy system. Parameters assessed. Pain perception, comfort.
- Ballard et al (2018) a systematic review on the efficiency of buzzy devices in pain management during needle-related procedures.
- Samiti et al (2021) randomized clinical trial. Comparison between buzzy and counter stimulation. Oxygen saturation, heart rate, VAS, and venham's anxiety rating scale, were used for assessing parameters.

RESULTS

Effect of Cooling the Injection Site

Local cooling causes vasoconstriction reducing tissue metabolism and the influx of inflammatory mediators during needle penetration. This mechanism is by the stimulation of A delta fibers. Cooling also acts by stimulation of C fibers that transmit slow pain and noxious thermal information to the brain in activating a supraspinal modulation which increases the body's overall pain threshold and therefore produces a generalized hypoalgesia at the site of application [4].

Effect of Vibration

Vibration confuses the pain pathway reception of signals allowing for the masking effect of pain. The device's vibration component triggers the A-beta fibers, A-delta fibers, and C fibers [5].

Buzzy is a battery-operated hand-held palm-fixed quickly vibrating device. It has 2 components [6]:

- A vibrating component
- A wing component as a source of cooling agents

According to snouts et al, the buzzy device was an effective method for reducing pain perception during LA delivery [7]. More male patients were recorded to have not perceived a difference in the buzzy and conventional techniques. According to Mohammed et al, 45% of study participants perceived lesser injection after usage of buzzy whereas 18% couldn't make out a significant difference [8].

DISCUSSION

Pain is a subjective experience that includes fear, anxiety, trust, personality, and a feeling of control over an unpleasant stimulus. The American Dental Association (ADA) states that fear of pain is the most important factor preventing individuals from visiting dentists. Inadequate pain management is a significant factor in the development of dental fear and anxiety. Dental anxiety is a multidimensional model with social, conscious, and physiological components; using a single parameter to assess this type of anxiety may not provide an accurate result. Therefore, a combination of three subjective scales (WBFPS, VAS, and VPT), one objective scale (VCARS), and a physiologic parameter (pulse rate) are employed to measure pain and anxiety levels in children [9].

The results showed of the analyzed studies showed a significant decrease in anxiety levels in both groups, with a higher percentage in the buzzy device group. Children in the buzzy device group experienced less pain than those in the conventional syringe group when measured using the WBFPS and VAS [10,11]. Aminabadi et al. (2008) juxtaposed counter-stimulation in combination with verbal distraction with counter-stimulation alone and the conventional LA administration method in 5-year-old children. They reported that children who received injections with a conventional syringe and verbal distraction had less pain perception [12].

CONCLUSION

Buzzy device is effective for minimizing pain during injection of local anesthetics. The use of this device can be effective, especially in pediatric patients and apprehensive adults alleviating pain associated with dental local anesthesia procedures. This leads to better cooperation during treatment and improves the outcome of the same.

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