

ANESTHESIA WITHOUT NEEDLE - ROUTINE OR RANDOM ACT IN PRACTICE OF DENTAL OFFICE

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Abstract : Through it's techniques, modern anesthesia has as main "target" shaping the patient's condition and his comfort by inhibiting the negative emotion which has a vital role in shaping the degree and intensity of pain by increasing the central and autonomic nervous system activity that weakens cognitive process, allowing a balanced reaction during surgery. As they have discovered new techniques and systems for management for dental pain , dental practitioners have been given the chance to have handy ways of anesthesia for teeth and soft parts, methods that were initially viewed with great restraint and suspicion. Using a topical anesthetic before the puncture anesthesia is or should be a routine measure in the practice of dentistry.

INTRODUCTION

Although the therapeutic arsenal of techniques poses ways to reduce and cancel the pain beginning with analgesics, loco-regional anesthesia, excitement and anxiety, fears persist in patients to undergo dental care. While the patient is aware that his state of fear is not justified, sometimes irrational, he can do nothing to control or destroy it. Through his techniques, modern anesthesia is to "target" mainly shaping the patient's condition by inhibiting the negative emotion which has a vital role in shaping the degree and intensity of pain by increasing the central and autonomic nervous system activity that weakens cognitive process, allowing a balanced reaction during surgery. Pain is seen as a subjective phenomenon or a perception of a sensitive or unpleasant emotional experiences associated with actual or potential trauma. Pain may be felt or experienced by an individual only when certain impulses reach the "conscious mind" and are interpreted as being painful (1). Efforts of specialists to the mediate pain involves stopping painfully messages, preventing them to reach the level of consciousness and activate to change the issue of upward paths painful signals.

Today very few manoeuvres in dentistry, runs without loco-regional or general analgesia. It was found however that it is not always sufficient to prevent and control pain. Analgesic substances by their properties acting on a single aspect of complex pain control that is the sensory component. (8,14)

Painful messages are related to higher brain structures in terms of processing noxious sensory stimulus. Painful sensitivity generates a series of individual events that constitute a behavioral complex which acts as a "friend" or "enemy" of health, depending on the intensity and duration of nociceptive stimula. Eventually become conscious pain and today remains an event difficult to quantify, mainly due to involvement of a major affective component with a high degree of subjectivity. (1,11,15)

Although the main mode of administration is by injection , local anesthetic can be applied and locally. Intraoral topical applications can be used to reduce the discomfort that occurs during the anesthetic injection. To ensure the intraoral anesthesia, to reduce pain that occurs due to mucosal lesions (ulcers) or to reduce pain or pain during the post extraction rash. (3,4,7)

There are several forms of intra-oral presentation of the anesthetic used. Anesthetic may take the form of:

- salt dissolved in water
- dissolved in organic solvents
- oil -
- Eutectic mixture
- form of patch
- other controlled-release device.

Presentation influences anesthetic efficacy. In a study on human volunteers a smaller amount of Lidocaine on a patch compared with application by spray or ointment to achieve the same effect of anesthetic from the gums (5). In addition, incorporation of a patch of anesthetic increases the duration of application of topical anesthetic compared with other forms of presentation (5,15).

MATERIAL AND METHODS

Our research attempted to link the type of topical anesthetic used in loco-regional anesthesia before puncture to tooth extraction – Lidocaine, EMLA, Oraqix, that we used in our patients and a special index created by us named – ANESTHESIA ACCEPTATION, that show the degree of perception for painful anesthetic puncture.

Human material used in our study consisted of 1275 patients treated in the period 2007-2009 refer to the Department of Oral and maxillo-facial surgery - ambulatory, Iasi to which patients have been practiced tooth extraction all made with loco-regional anesthesia preceded of topical application. The patient were divided into three equal groups, each of 425 patients as follows : group 1- EMLA topic application before surgery, group 2- Lidoaine gel topic application before surgery, group 3- Oraqix topic application before surgery,

In questioning after surgery - in relation to our patients we observed the following statements:

- Some patients said they suffered with very high acceptance puncture anesthesia - degree of acceptance 100%
- Some patients said they supported with moderate acceptance puncture anesthesia - degree of acceptance 50%
- Finally some patients said they suffered heavy puncture anesthesia, but not because of pain but because of fear - degree of acceptance 25%

Local anesthetic achieves its effect by coupling to some receptors of sodium channels in nerve cells. Water facilitates the diffusion of anesthetic, however, unchanged anesthetic molecules are not soluble in water. This disadvantage is overcome by the use of oil emulsion, which increases the concentration of bases in water. Anesthetic is then dissolved in oil is emulsified with an aqueous vehicle. Maximum concentration of lidocaine in oil is 20%, however, when combined lidocaine and Benzocaina produce a Eutectic mixture of achieving a concentration of 80%. This mixture is known as EMLA (Eutectic mixture of local anesthetics). (2,6,9)

When applied in the form of local anesthetic ointment or cream is issued on the area where applied. The quantity entering the mucosa is uncontrolled. To overcome this disadvantage, introduced the use of controlled-release devices (9) to free a good amount determined from time to time.

Another method used to increase penetration after application of topical anesthetic in the anesthetic is incorporation of liposomes (15). They are artificial membrane with one or more layers that form when phospholipids are suspended in aqueous solution (13,14).

Issue of a hydrophobic drug is better achieved by a homogenic structure. A structure with more aqueous phases is optimal for the incorporation of a hydrophilic drug.

In addition to increasing penetration, another advantage of liposomes include low dose, prolonging drug action by protecting the drug from metabolism (5) and decreased systemic toxicity. They were investigated as injectable and topical form applied on the skin.

Use of liposomes for intra-oral local anesthetic administration was reported in 2 studies. One (4) compared Ametocain 5% 20% Benzocain liposomes and liposomes in a double-blind trial. The results indicated that anesthetics reduce the discomfort associated with liposomes and infiltration anesthetic needle puncture.

The other study (5) made a comparison between Ropivacain liposomes with 1% 1% Ropivacain plain EMLA and 20% Benzocain to reduce discomfort during anesthesia puncture. Preparations liposomes prolong anesthesia compared with 20% Ropivacaina simple Benzocaina, being similar in effect to EMLA.

Using a topical anesthetic before the puncture anesthesia is or should be a routine measure in the practice of dentistry. A recent study made on 500 physicians in the United Kingdom reported that 95% of them used frequently topical anesthetics before applying local anesthesia and anesthetics lidocaine and Benzocaina puncture. (6)

The topical anesthetic is not fully there pharmacological and psychological effects. (8) Subjects were informed that they will be given a topical anesthetic before taking a puncture anesthesia were described less pain compared with controls, thus demonstrating there was a significant correlation between pain designed and described by patients. (11,15)

RESULTS AND DISCUSSION

Lidocain spray is a topical anesthetic effect of membrane stabilization. Decreased cell membrane permeability to sodium, lidocaine reduced rate depolarization as action potential amplitude and inhibits nervous transmission. The local application to mucous membranes, lidocaine is absorbed to varying degrees in relation to dose and application site. Effect of lidocaine spray occurs 1 min after application and lasts for 5-6 minutes and subjective anesthesia slowly disappears in about 15 minutes. Presentation is 38 g vial provided with the valve cup containing 3.8 g lidocaine,

ingredients: propylenglicolum, aetheroleum menthae piperitae, alcoholum 96%. The amount of lidocaine released in each puff = 4.8 mg. It is shown that local anesthetic spray to the mucous membranes: before the intervention minor superficial dental, oro-maxillo-facial surgery, Otolaryngology laringologie, dermatology. Dosage can vary widely in connection with the indication and the size of area to be anesthetized. To avoid high plasma levels is important to use the lowest dose that produce a satisfactory effect. 1.3 sprays are usually sufficient. The data reported in dentistry and OMF surgery, lidocaine spray may be used in children, preferably in the form such as spraying caused both fear and the usual stinging sensation mentioned as a side effect. Even children under age 2 years can be treated in this way. Lidocaine administration requires special precautions in patients using antiarrhythmic preparations tocainidin type because of the potential enhancement of local anesthetic effects toxice. Avantages of the method based contact gel Benzocain gel, compared with anesthesia-based contact spray Gingicain, Xylestezin are obvious, because it avoids spraying anesthetic substance in the target area neighborhoods and work accordingly and sensations of respiratory discomfort swallowing.

Lidocaine 5% EMLA is higher as the market is a product containing 25mg / g lidocaine and 25 mg / g Prilocaina called Oraqix which is thermosensitive, having liquid at room temperature and when applying to sulcusul gum is gelifing.

Oraqix indicated for intraoral use, compared with subjects reporting EMLA taste and smell better than with EMLA. (5) (Fig. 1)

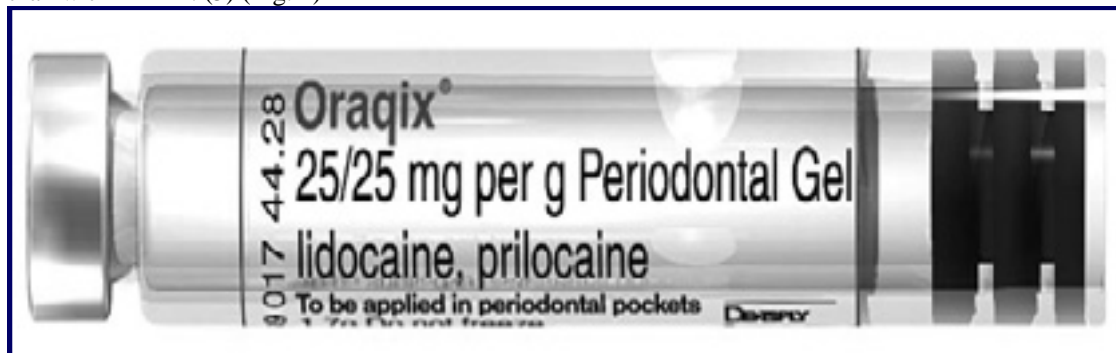


Fig. 1. Comercial Oraqix (www.oraqix.com)

Oraqix have been investigated to reduce intraoral injection discomfort produced which is more effective than Benzocaina gel with 20% in reducing pain on palatine vault mucosa. The indication is to reduce discomfort Oraqix use during periodontal therapy. (13) This was evaluated in several studies as the only anesthetic used during periodontal treatment. When applied in bags periodontal anesthesia is rapid installation in 30secunde. (13) (Fig .2)



Fig. 2. Application Oraqix in the sulcus and periodontal bags (www.oraqix.com)

In a study on 30 patients who used it to relieve pain Oraqix had significantly greater effect after 30 seconds compared with 2 minutes after applying the gel, although there was no difference between applications in 30 seconds and 5 minutes . (12).

There were no reported differences in duration of anesthesia in a poll in 30 seconds, 2 minute AND 5-minute application (average duration was 18-20 minutes), however, the study authors say this is important for scaling and surfasajul root. (4.6)

A case-control study on 130 subjects (12) analyzed discomfort during periodontal curettage after application of 30 sec in Oraqix periodontal bag.

The results showed that pain sensation was significantly lower than with placebo. On a scale of 5 points differences were small, 78% reported no pain or mild pain during the curettage, 76% placebo. Another investigation (10) used the same type of study but the application time varied between Oraqix of 30secunde and 2 minutes. The differences were significant between placebo and Oraqix, 90% of patients with Oraqix and 64% of placebo patients reporting low pain or no pain. No data on correlation time efficiency on their application. The data from these trials suggest that Oraqix effects are more pronounced in patients with advanced marginal periodontitis. Starting from this discovery, another study (224) resulted Oraqix effects in patients who reported pain of moderate or severe periodontal surveyed (ie> 30 mm analogue scale) (225).

In our study we made the folowing records :

Group Lidocaine : (Fig .3)

- degree of acceptance 100%45 %
- degree of acceptance 50%.....32 %
- degree of acceptance 25%..... 23 %

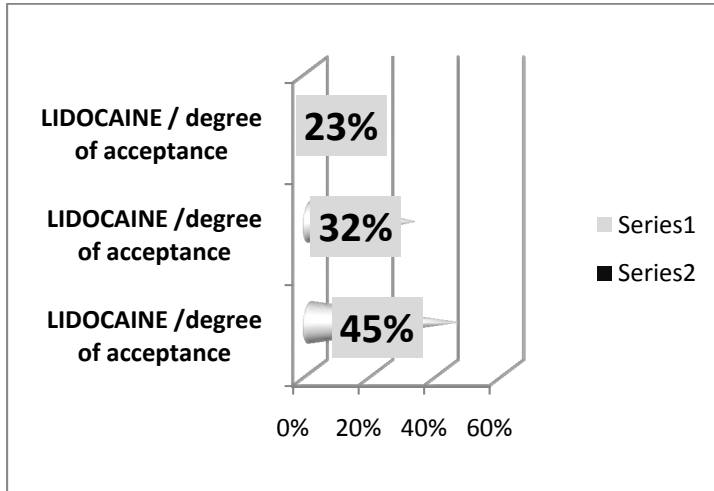


Fig.3 Group Lidocaine

Group EMLA : (Fig .4)

- degree of acceptance 100% 58 %
- degree of acceptance 50%.....28 %
- degree of acceptance 25%..... 14 %

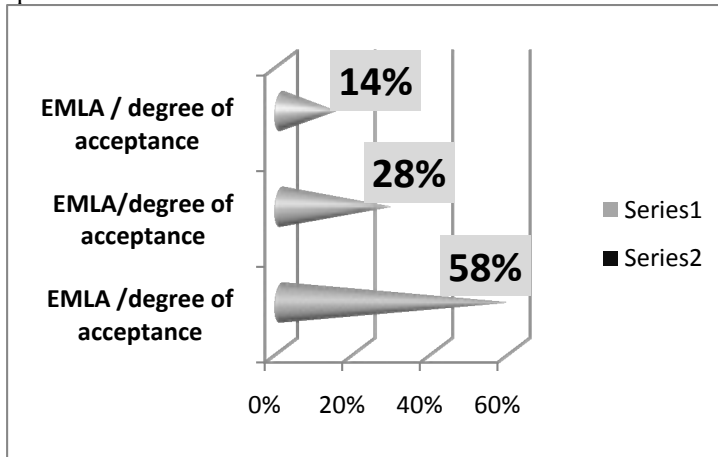


Fig.4 Group EMLA

Group Oraqix : (Fig .5)

- degree of acceptance 100% 49 %

- degree of acceptance 50%.....31 %
- degree of acceptance 25%..... 20 %

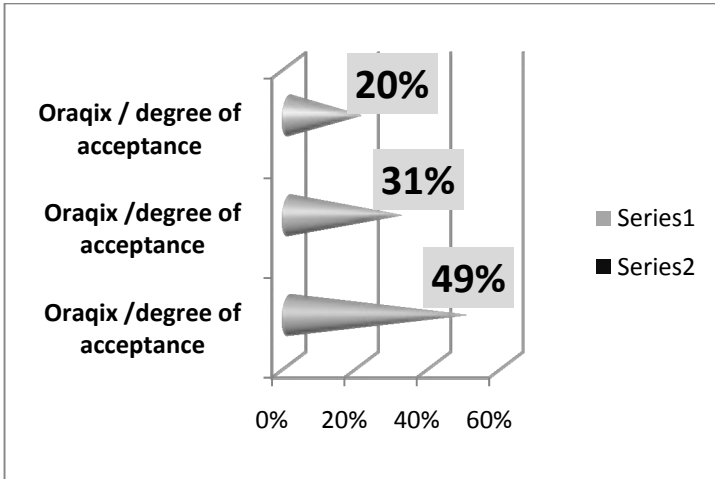


Fig.5 Group Oraqix

Comparative analysis on study groups across the three topical anesthetic agents used showed us that EMLA has the best ability to reduce and cancel the pain and fear associated with anesthetic puncture : 58 % degree of acceptance. (Fig .6)

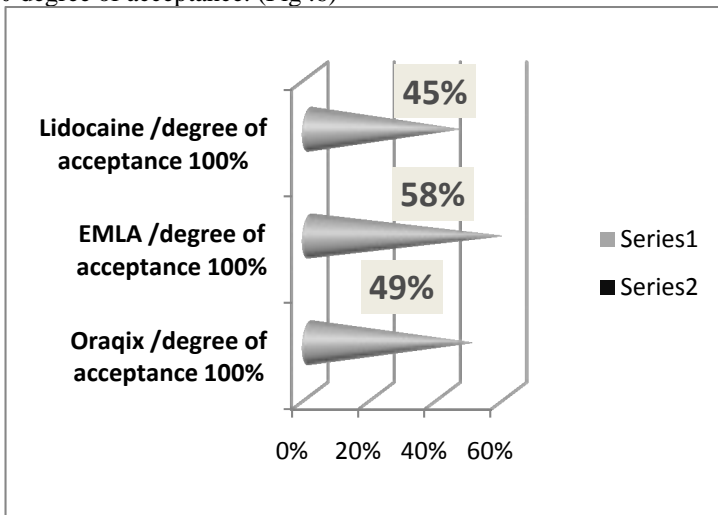


Fig. 6 Comparative analysis on study groups across the three topical anesthetic agents used

CONCLUSIONS

The amount of anesthetic is important when talking about side effects . Anesthetic concentration in topical preparations is greater than the injectable forms. Topical administration reaches high

levels in comparison with intravenous injection of low speed. Although the plasma levels is 1 / 3 of that obtained by intravenous administration, the rate of entry into the bloodstream is more quickly.

1. Lidocaine - plasma level is increasing steadily after using the patches containing either 10 or 20 mg of local anesthetic after 15 minutes of application, remaining stable for a period of 30 minutes. Average plasma level obtained was 0016 micrograms / ml for the patch by 10% and 0022 micrograms / ml for the patch by 20%. These levels are low in comparison with those obtained by intra-oral injection of lidocaine 2% .
2. Lidocaine plasma levels are higher than the prilocaine due to rapid metabolism of lidocaine. The highest concentrations of lidocaine were 0.47micrograme/ml 5 minutes and the prilocaine of 0.21 micrograms / ml at 10 minutes after application of 4g of EMLA.
3. Absorption was very fast compared to EMLA in 10% lidocaine spray, but the only significant difference was the mean plasma level for lidocaine 10% spray at 30 minutes with a value of 0.35 micrograms / ml compared with EMLA 0.14 micrograms / ml.
4. The highest concentration of lidocaine in EMLA group was 0.47 micrograms / ml at 5 minutes compared with 0.66 micrograms / ml in the lidocaine group at 20 min.
5. Maximum plasma levels of anesthetic were obtained in 3.7 hours and 3.3 hours for lidocaine Prilocaina after starting the application. Highest level of lidocaine was 0.55 micrograms / ml and Prilocaina of 0.18 micrograms / ml.
6. We have said that topical anesthetic effect when administered intra-oral and some formulas have demonstrated superiority. When used properly reduce the discomfort associated with needle puncture. However, in the patients with high anxiety, high pain threshold which scales discomfort produced by puncture anesthetic can not be reduced simply by applying a local anesthetic.

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