

Survey of Usage and Type of Topical Anesthesia among Dentists of Tricity

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ABSTRACT

Introduction: Local anaesthesia injection is widely accepted as the gold standard for pain management during various dental procedures. Intra-oral topical anaesthesia not only reduces the pain of injection prick but also several minor dental procedures can be carried out under topical anaesthetic. Study aimed to determine the usage, type & effectiveness of various topical anaesthetics used for minor dental procedures in pediatric patients.

Material and Methods: A self-structured, closed ended questionnaire was emailed to 100 private dental practitioners in the tricity and were asked to fill and mail it back.

Results: 59% dentists responded, out of them 70.7% routinely used topical anesthetic. 64.8% used Lidocaine gel for administration of local anesthesia. 24.1% used topical anesthetic for extraction of nearly exfoliating deciduous teeth. 42.6% responded that the effect of topical anesthetic was achieved between 30 seconds to 1 minute.

Conclusion: All the dentists were aware of using topical anesthetic and the most preferred delivery system was gel.

Keywords: Topical Anesthetics, Lidocaine, Local Anaesthesia.

INTRODUCTION

Intraoral local anesthesia is commonly used for children to control pain during several dental procedures. Paradoxically, administration of local anesthesia itself produce pain and anxiety that may cause subsequent unfavorable behavior.¹ The mechanisms by which the pain is caused upon injecting the anesthetic solution have not yet been clearly identified,² but some factors like properties of the injected solution, method of injection, and the tissue sensitivity of the injection site.³ Needle insertion produces mechanical trauma of the tissues, and the intensity of pain is related to the area of injection.⁴ The pain and discomfort resulting from injection can be minimized by using a variety of techniques. These include appropriate behavior management techniques, altering the pH and temperature of the anesthetic solution and injecting the solution at reduced rate.⁵ Another effective method is use of topical local anaesthetics to reduce acute and chronic pain as well as facilitate atraumatic dental treatment which induces temporary loss of sensation on the applied surface up to a depth of 2-3mm by blocking signal transmission in the terminal fibers of sensory nerves.⁶ Topical anesthetics have both psychological and pharmacological effects. Subjects who are informed that they are to receive a topical anesthetic for comfort during injection of local anesthetic anticipate less pain during injection than those

not offered such counselling.⁷ Topical anesthetic agents are available in gel, liquid, ointment, patch, and aerosol forms.⁸ Thus, the main purpose of this study was to determine the usage and effectiveness of various topical anaesthetic being used among pediatric dentists and other specialists during various minor dental procedures in children and to determine the type of topical anesthetics most coonly used.

MATERIAL AND METHODS

300 private dental practitioners who were members of IDA were taken in the study. A self-structured, closed ended questionnaire was designed. Which included demographic, professional characteristics and knowledge regarding usage and type of topical anesthesia.

Inclusion criteria

- Dentists willing to participate in the survey
- Dentists registered under IDA Tricity (Panchkula-Chandigarh-Mohali)

Exclusion criteria

- The Dentists not fulfilling the inclusion criteria were excluded from the study.

The protocol of the study was approved by Institutional Ethical Review Board (IRB).

MATERIAL AND METHODS

Cross sectional survey was designed comprising of 300

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dentists practicing in Tricity. The survey composite was made up of 13 questions. Survey forms were collected, posted and managed through www.googleforms.com.

Questions 1-3: Demographic information, Actively practicing dentistry treating children, Type of dentistry and for how long.

Questions 4-7 -Current use or lack of use of topical anesthetic, Form of topical anesthetic and age group, Preferred delivery system.

Questions 8-11 - Reasons for using /not using TA, Types and effectiveness, Different types of procedures.

Questions 12-13 - Time period noted after the use of topical anesthetics, Reason for acceptance by patient. One week after the first email request, a reminder email was sent again to the entire sample. Only those responses received within 8 weeks from the first invitation were included in the data collection. The survey was then closed and the data was analyzed by computing the response for each question.

1. Are you actively providing dental services for children at this time?

- Yes
- No

2. In which field of dentistry do you currently practice treating children?

- General Dentistry
- Pediatric Dentistry
- Other Specialist

3. How long have you actively been practicing dentistry treating children?

I do not currently treat children

- 0-5 yrs
- 6-10 yrs
- 11-15 yrs
- 16-20 yrs
- 21+ years

4. Are you currently using topical anesthetics on children?

- Yes
- No

5. What form of topical anesthetic do you use?

- Benzocaine
- Lidocaine Gel/ Ointment
- Xylocaine
- Others

Please specify:

6. Upto what age group do you use intra oral topical anesthetic?

- 3-6 years
- 7-9 years
- 10-13 years
- Any

7. Which delivery system do you prefer for intra oral topical anesthetic?

- Spray, Gel/ointment, Patches, Oral rinses or non – injectable syringes

8. What is your response for the reason in (6) above?

- Better analgesic effect
- Patient preference
- Availability/ Cost
- No specific reason
- Other

Please specify:

9. If you do not use topical anesthetics what are the reason(s) why?

- I routinely use topical anesthetic
- Concerns about patient acceptance
- Methods of delivery
- Difficulties keeping it localized at application site
- Concerns about anesthetic overdose
- Don't believe it to be effective
- Others

Please Specify:

10. Which type(s) of topical anesthetics are currently being used in your practice on children? How would you rate the general effectiveness?

Name of the Topical anesthetic used	Very Effective	Effective	Not Effective	Not Used

11. For which procedures are topical anesthetics along being used on children? Which type(s) of topical is used for the procedure?

Name of Anestheisa	Please Specify Procedure

12. How long do you wait after applying a topical anesthetic before you inject?

- Less than 30 seconds
- 30 seconds to 1 minute
- >1 minute to 2 minutes
- More than 2 minutes

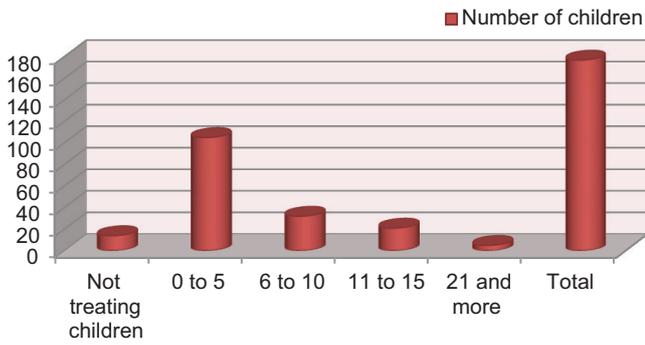
13. What do you feel is the most important factor in patient acceptance of topical anesthetics?

- Taste
- Consistency
- Colour
- Smell
- Others

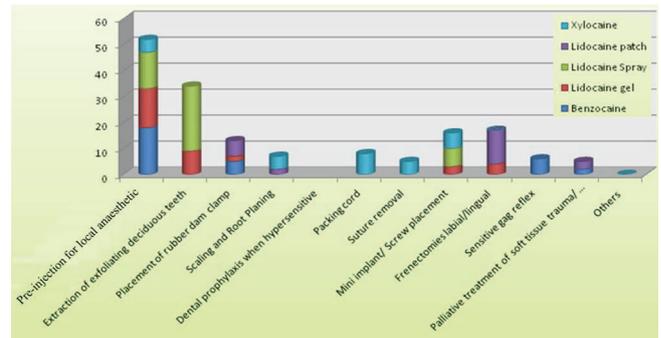
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RESULTS

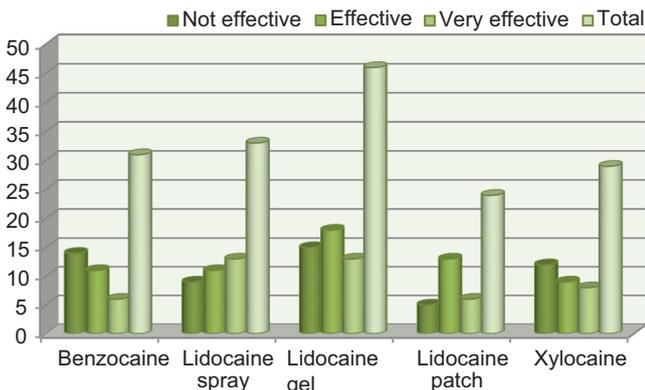
Out of total 59% dentists responded to questionnaire; 67% were actively treating children whereas 33% were not, in which 39% were pediatric dentists, 24% were general dentists and 37% were from other specialists all listed as active members of the Indian Dental Association. Of those responding, 58% have been in practice treating children 0-5 years, 17% 6-10 years, 3% 11-15 years, 2% 21 years or more



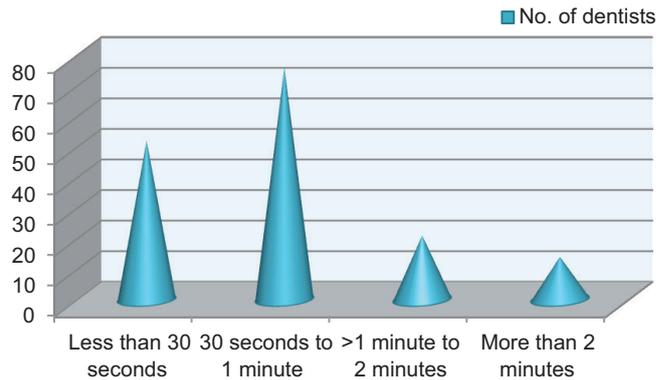
Graph-1: Age wise distribution of patients being treated in dental clinics in tricity



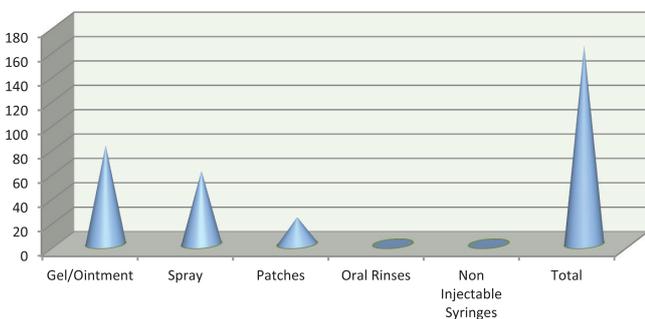
Graph-5: Most common procedures for which topical anesthetics are being used in children



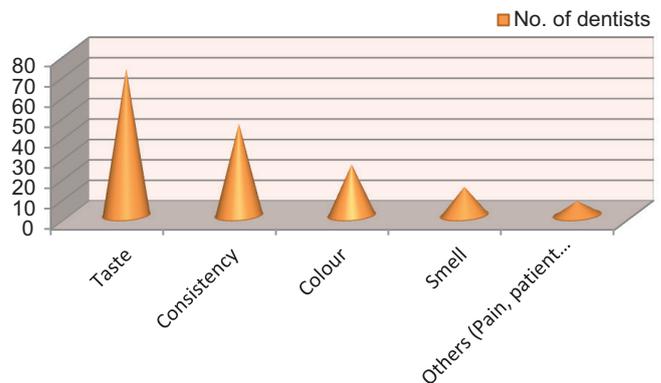
Graph-2: Distribution of dentists using various types of topical anesthesia and their effectiveness



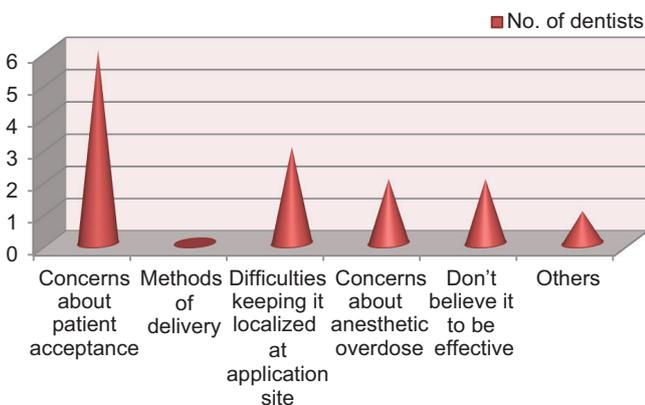
Graph-6: Time taken after applying a topical anesthetic before procedure



Graph-3: Use of various forms of topical anesthesia



Graph-7: The most important factor in patient acceptance of topical anesthetics.



Graph-4: Distribution of dentists with reason of not using topical anesthetics

and 20% were currently not treating children (Graph-1). Form of topical anesthesia had 58% lidocaine gel users, 14% lignocaine spray, 11% xylocaine and 11% benzocaine

(Graph-2). When questioned which delivery system preferred for intra oral topical anesthetic, spray (62%) was the most preferred one as compared to gel (33%) followed by patches (3%) and oral rinses (1%) and the reason for using spray was better analgesic effect (38%) (Graph-3). When questioned regarding the rate of effectiveness of topical anesthesia 67% rated it as very effective and 26% rated as effective whereas 5% dentists were not using and only 2% found it to be not effective. When asked about procedures for which topical anesthetics being used on children, pre-injection of local anesthesia was the most common procedure (66%) followed by extraction of exfoliating deciduous teeth (26%), placement of rubber dam clamp (6%) and scaling (2%) (Graph-5). When questioned concerning the waiting period after

applying a topical anesthetic before you injection 42% dentists waited 30 seconds to 1 minute, 35% used to wait for 30 seconds, 18% for 1-2 minutes and 5% for more than 2 minutes (Graph-6).

When asked about most important factor in patient acceptance of topical anesthetics, 47% were concerned about taste, 31% about consistency, 9% responded as other reasons, 2% pain, 2% smell, 2% patient cooperation and 2% patient comfort (Graph-7).

DISCUSSION

59% of the dental practitioners responded to questionnaires. In the survey, the most common procedures for which topical anesthetics used by the dentists were pre-injection of local anesthetics, followed by extraction of exfoliating deciduous teeth, placement of rubberdam clamp, and palliative treatment of soft tissues. Practitioners reported many other procedures didn't require topical anesthetics like scaling and root planning, dental prophylaxis when hypersensitive, packing cord, suture removal, mini implant/screw placement, frenectomies, sensitive gag reflex.

Mathews et al. found that patient preferred for topical anesthetic gel when given the choice of no anesthetic or local anesthetics injections. Concern about dental pain and anxiety about needles were the main factors that determined preference and how much they were willing to pay.⁹ With further study this could become a viable and reimbursable option for the perceived parental anxiety as well as the anxious patient.

Among various types of topical anesthesia lidocaine and benzocaine were equally effective (p value > 0.05). The taste preferences observed was, better acceptance to Lignocaine than to Benzocaine which was in concurrence with the study performed by Kavita et al.¹⁰ There was no significant difference between efficacy of spray and gel.

Malamed¹¹ suggests that the occurrence of allergic reactions to esters is greater than that to amide topical anesthetics; however, since benzocaine is not absorbed systemically, allergic reactions are usually localized to the site of application. Of the amides available, only lidocaine possesses topical anesthetic activity in clinically acceptable concentrations. The risk of overdose with amide topical anesthetics is greater than that with the esters and increases with the area of application of the topical anesthetic. For the period of wait after application of topical anesthetics, Hurricane, manufacturers recommend waiting should be 10-30 seconds before injecting depending on the form of the preparation while manufacturers of Xylocaine, recommend waiting time should be several minutes before injecting. Malamed recommend 60 seconds or longer before injection to assure maximum efficacy of topical anesthetics. Others recommend a wait for approximately 30 seconds.¹¹ There seems to be a lot of confusion in the literature related to the usage and waiting periods of topical anesthetics and more research in this area is needed. Most practitioners responded that the current topical anesthetics they were using in their offices were very effective, while about 26% thought they

were effective. The fact that 2% of them perceived topical anesthetics to be ineffective is consistently with the fact that 5% of the respondents reported that they never used topical anesthetics. Most practitioners responded that their patients disliked the taste, consistency and the warm/burning sensation of the topical anesthetics.

A study done by Primosch compared benzocaine 20% gel to EMLA cream (2.5% lidocaine and 2.5% prilocaine) comparing effectiveness in reduction palatal injection pain. Both agents showed similar pain responses by the patients, but the benzocaine gel was preferred due to better taste.¹² The authors discussed the idea that the actual efficacy of topical anesthetic in reducing pain is still in dispute and argued that acute pain can be influenced by several factors including fear, anxiety, and trust. If the patients believe that the topical anesthetic works, the anxiety felt by the patient before injection is reduced.¹²

Garg et al¹³, evaluated the efficacy of 2% lidocaine gel and 20% benzocaine gel for topical anesthesia. Their split mouth study design compared topical 2% lidocaine gel, 20% benzocaine gel, and placebo paste in same patient for 1 minute before needle insertion. Immediately, after needle insertion, participants indicated pain intensity on visual analog scale (VAS). The authors found that the lidocaine and benzocaine significantly reduced pain over the placebo used, validating the benefits of topical anesthetic with painful procedural dentistry.

Limitation of the study included smaller sample size and inability to follow up for the answers of asked questions.

CONCLUSION

All the dentists were aware of using topical anesthetic and the most preferred delivery system was gel. Most common procedure for which topical anesthesia was being used was pre injection of local anesthesia followed by extraction of deciduous teeth. Most of the dentists found topical anesthesia as very effective, however, their perception of the effectiveness of topical anesthetics varied. There also appears to be a need to develop newer and better mode of topical anesthetic delivery system in the pediatric dentistry.

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