

The Use of Topical Anesthesia among Dentists: An Online Survey

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ABSTRACT

Introduction: Providing “painless” dental care has been one of the main goals of dental surgeons for decades. The experience of pain with dental procedures can lead to avoidance of much needed oral health care due to dental fears and anxiety. According to the American Academy of Pediatric Dentistry, the prevention of pain during dental procedures can nurture the relationship of the patient and dentist, building trust, allaying fear and anxiety, and promoting a positive dental attitude. **Aim:** This study aims to determine the current usage of various topical anesthetics (TAs) among dentists. **Methodology:** Surveys were sent online to dentists asking about their usage of TA. The survey included questions ranging from the type of TA used, waiting time after the application of TA, if the practitioner considered the TA effective, and what percentage of the patients had an adverse drug reaction (ADR) to TA. Data were analyzed by computing the percentage response for each question. **Results:** TA is used by most dentists and the most commonly used is lignocaine spray (15% w/w). About 40.3% waited for 11–30 s after the application of the TA. Most patients (70.1%) disliked the taste of TA and ADRs are rarely seen. **Conclusion:** TA has been commonly used, however, the perception of its effectiveness is varied. There also appears to be a better acceptance of flavored TA in the pediatric dental population.

Key words: Dental clinicians, pedodontia, topical anesthesia, web-based survey

INTRODUCTION

Feeling afraid or anxious is a commonly reported emotion among children visiting health-care centers or interacting with medical professionals. Children prefer behavioral communications compared to verbal communication because of their developmental level and limited cognitive development.^[1] Among the identified barriers to delivering oral health services to the pediatric age group; anesthetic injections were reported to produce the greatest negative response among the children.^[2] Anxiety and pain were responsible for reducing the efficacy of the anesthetic agents in pediatric patients. The fear of anesthesia reportedly involved behavioral management problems, with very few dentists successfully coping up with the patients.^[3] Dental anxiety was among those factors which affected quality of life of both the kids and also their parents.^[4] Assurances on delivering painless dental treatment would help in reducing the anxiety, thereby improving dental visits.^[5] To render the treatment “painless,” the clinicians must use topical anesthetic (TA) agents that would effectively reduce the amount of anxiety and pain among the pediatric patients which could improve the quality and prognosis of the treatment along with reduction of the working hours.^[6] TA usually reduces the needle prick pain, thus improving patient cooperation.^[7] These drugs mainly act by inhibiting the neural transmission. Thus, the

present study was conducted with the aim to assess the current usage of various TA agents among the dentists in the country.

METHODOLOGY

A cross-sectional, descriptive, web-based questionnaire survey was conducted among the dental practitioners in India from January 2021 to March 2021.

Sample population

Practicing dental clinicians were approached by the principal investigator through snowball sampling technique: Through known contacts. The sampling frame comprised 1200 dentists who were contacted by the investigator through email to complete the questionnaire. A total of 1041 dentists participated in the study. The response rate for the study was 86.75%. All clinicians using TA agents for rendering dental treatment to the pediatric patients and willing to participate in the study were included in the study.

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Sampling

A multistage proportionate cluster random sampling method was used. India was divided into five different zones: Eastern zone, Western zone, Southern zone, Northern zone, and Central zone. The dentist population was most in the Southern zone followed by the Western zone and least in the Eastern zone. The list of all practitioners was obtained from individual state dental councils and local Indian Dental Association branches.

Sample size calculation

The sample size was calculated using G Power 3.0 software and a minimum sample size of 653 dentists was attained.

Questionnaire

A self-structured questionnaire was made in the form of Google Forms and distributed after validation. The questionnaire consisted of 14 closed ended, three open ended; both pre-tested and self-framed, self-explanatory questions on "Current usage of TA agents among dental practitioners in India." The questionnaire was divided into three sections: The first section consisting of questions about the demographics of the participants; the second part toward the practices of the clinicians about TA; and the third part regarding concerns concerning adverse drug reactions (ADRs). A total of 17 questions were included in the study. The reliability coefficient for questions in each of the subscales was calculated using.

RESULTS

A total of 1041 dental clinicians took part in the online survey. The demographic characteristics (type of practitioners, frequency of TA use, and the reasons to refrain from anesthetic use) of the study population are included in Table 1. The majority of the respondents were from separate specialties (42.7%). Most of the dentists believed that TA helped in the obtained treatment (94.2%). It was seen that the majority of the participants always used TA (47%). Most of the participants felt that patient acceptance was the reason to avoid TA usage (47.5%). Lignocaine 15% was the most used TA agent in regular dental practice (56.6%).

The knowledge and practice of the dental practitioners are represented in Table 2. The majority of the participants believed that the local anesthesia was effective (66.1%). The dental clinicians mostly waited for 11–30 s post TA application (40.3%). Anesthetic spray was reported to be more effective than anesthetic gel (63.5%). On recommendations about a better route of TA administration, patch was the most commonly reported answer (7.2). Dentists preferred flavored anesthesia (74%) and the majority believed that flavors improved the patient's acceptance (93.3%).

Figure 1 states the procedures for which local anesthesia is used. Figure 2 graphically represents the patient's compliance toward topical anesthetic use. Table 3 states the ADRs experienced. Allergy was the most common reported reaction (6%).

Figure 3 graphically represents the various flavors of topical anesthetic used.

DISCUSSION

Copious studies have been conducted toward the indications, contraindications, and regular use of TA agents by dental clinicians around the globe. The present study has been conducted to update the knowledge regarding the practice of dentists of TA agents to deal with the anxiety and pain in pediatric patients. The primary aim of all practitioners is to provide treatment to the patient in the least painful way possible. This aim becomes particularly important when considering the very young, anxious, fearful, and needle phobic patient. The response rate of the current survey was eye catching as compared to an online survey where a majority of the online surveys report an average of 70–80% response rate.^[8]

Lee found that there is an overwhelming patient preference for TA when given the choice of no anesthetic or local injectable anesthetics. Most participants were willing to pay to have TA available for themselves or others.^[9] This study showed that 94.2% of practitioners believed that the TA agent helped reduce anxiety among the patients. A variety of practices was seen in the present study. It was seen that most of the dental practitioners preferred

Table 1: Demographic characteristics of the population

Variable		Percentage
Type of practitioner	General	37.8
	Pedodontists	19.5
	Other specialties	42.7
How often do you use TA	Always	47
	Sometimes	45.1
	Rarely	7.5
	Never	0.5
Does TA help in the treatment	Yes	94.2
	No	5.8
Reasons to not use local anesthesia	Patient acceptance	47.5
	Method of delivery	29
	Difficulty in localizing at the application site	33.4
	Concern of overdose	11.8
	Ineffective	12.4
	Not available	0.1
	Effect is minimal	1.7
	Excess salivation	1.2
TA type used	Time constraints	1.1
	Lignocaine 15%	56.6
	Benzocaine 20%	34.7
	EMLA	1.5
	Lignocaine 2%	2.7
	Lignocaine 8%	1.7
	Amlocaine	1.3
Ethyl chloride	1.4	

TA: Topical anesthetic

or rather recommended TA use because it clinically helped in reducing the needle piercing pain and thereby reducing the anxiety of the patients.^[3,10] Pedodontists are mostly benefitted from the usage of TA because it reduces the patients' anxiety and helps to carry out the treatment in a more calm and relaxing way which would improve the long-term treatment benefits. This finding

is not consistent with another survey by Kohli *et al.* which found that 71% of pediatric dentists would consider a different delivery system of TAs if it was available.^[2]

The recommendations or the reports of varied TA agents have been seen in other studies too.^[2,7] The present study findings are similar to the previous studies where dental clinicians have reported the use of lignocaine, amlocaine, EMLA, etc. The effectiveness of the various anesthetic agents was the major reason for using different types of anesthetic agents although the most common was lignocaine 15%.^[11]

In the present study the waiting time was eleven to thirty seconds. According to Malamed, the risk of overdose with amide TAs is greater than that with the esters and increases with the area of application of the TA. Benzocaine 20% gel manufacturers recommend waiting 10–30 s while manufacturers of xylocaine, recommend waiting several minutes. Malamed recommends 60 s or longer before injection to assure maximum efficacy of TAs. McDonald's recommends a wait of approximately 30 s. The fact that 0.2% of them perceived TAs to be ineffective is almost consistent with the fact that 0.5% of the respondents reported that they never used TAs.^[12,5] Waiting time in our study is comparatively lesser than other reported studies.^[13,14] Longer waiting time is associated with deeper penetration which would increase the effectiveness of the TA agent. Another problem faced by the dentists was increased salivation which could sweep away the local anesthetic agent intraoral and hence reduce efficacy. Adverse drug reactions are minimal in the application of TA and the present study stated that 6% reported an adverse drug reaction of allergy in certain patients.^[15]

A flavored anesthetic agent was associated with better patient acceptance. The availability of the flavored anesthetic agent improved the patients' compliance as it was tastier than bland unflavored ones.^[16,17] Recommendations to promote the usage of several other modes of delivering topical anesthesia could improve the performance of the dentist and the cooperation of the patients.

Table 2: Opinion and practice of the dental clinicians regarding TA

Variable		Percentage
Effectiveness of local anesthesia	Very effective	27
	Effective	66.1
	Poor	6.7
	Ineffective	0.2
Waiting for time post-TA application	≤10 s	19.3
	11–30 s	40.3
	31–60 s	32.4
	≥61 s	8
Increased efficiency	Anesthetic gel	36.5
	Anesthetic spray	63.5
Better route of TA administration	Chewing gum	4.2
	Patch	7.2
	With applicator tip	1.8
	Syringe system	1.7
	No response	85
Use of flavored anesthesia	Yes	74
	No	26
Better acceptance about the taste of TA	Yes	93.3
	No	6.7

TA: Topical anesthetic

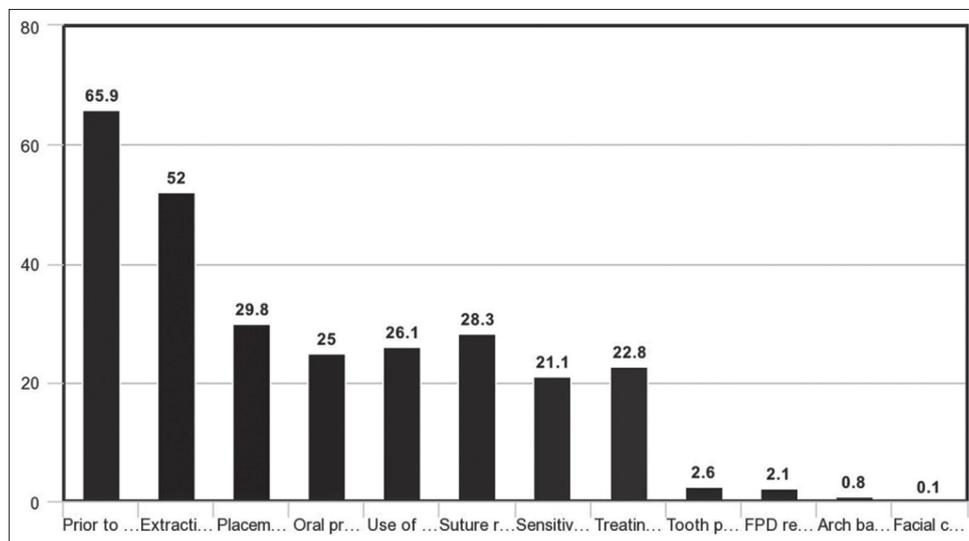


Figure 1: Procedures for which local anesthesia is used

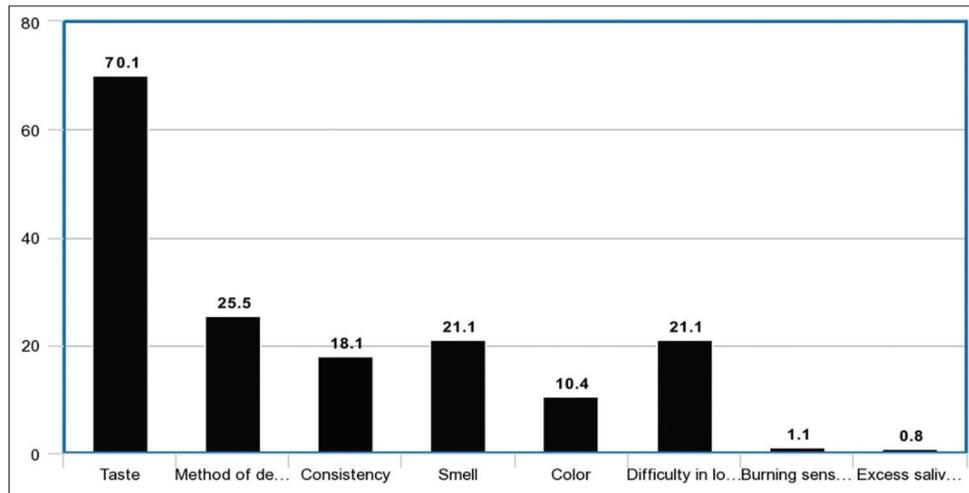


Figure 2: Patient's compliance toward topical anesthetic use

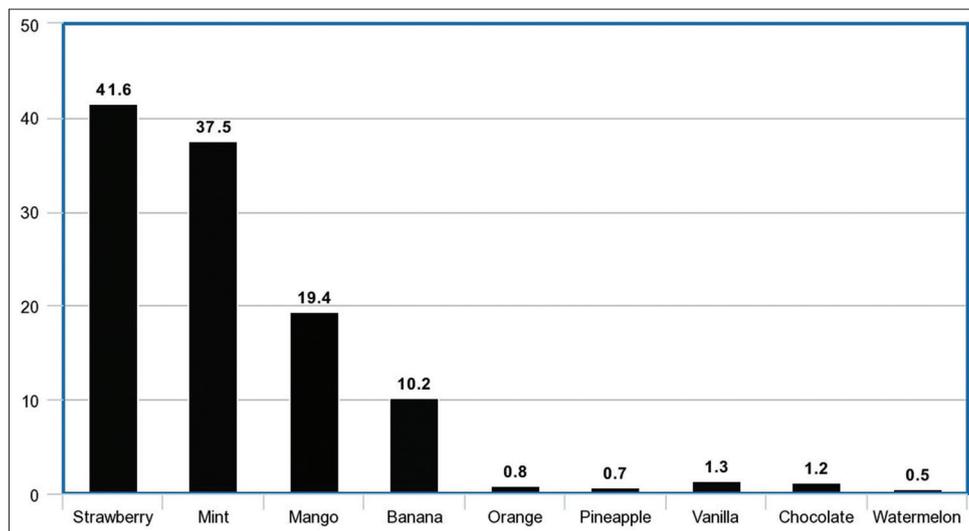


Figure 3: The flavor of anesthesia preferred by the dentists

Table 3: ADRs reported

Variable	Percentage
ADR reported	
≥10%	4.4
≤0%	83.7
1-5%	9.3
6-10%	2.6
The most common drug reaction reported	
Allergy	6
Ulcer	2.7
Slough formation	1.2
No response	90.1

ADRs: Adverse drug reactions

Limitations of this study are that it's completely voluntary; participation was anonymous as well as not the inability to ask follow-up questions for given responses. The specific wording of

questions may not have been clearly understood by all respondents, or the practitioner's lack of familiarity with certain survey items may have caused them not to respond creating a non-response bias. Adverse reactions noted to TAs were self-reported based on the practitioner's understanding of the reaction and willingness to report and may not reflect the true incidence of adverse reactions seen among children.

CONCLUSION

The present study overlays the picture of tropical anesthesia practice among regular dentists, pedodontists, and other specialties. It was seen 47% of the dentists always used tropical anesthetic agents in their practice. A total of 94.2% of the dentists believed that TA helped achieve better patient compliance. Thus, the present study concludes a positive response of the dental practitioners toward

the use of TA agents. Better performance would be achieved with increased education of the clinician about the benefits of TA usage.

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