



## Original Article

### Assessment of Knowledge and Attitude of Usage and Type of Topical Anesthesia among Dentists

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#### Abstract

**Background:** Local anesthesia refers to a loss of sensation caused by a reversible blockade of nerve conduction around the site of application. Present study aimed to assess knowledge and attitude of usage and type of topical anesthesia among dentists. **Material and Methods:** The present study was conducted in the Department of Dentistry. For the study, 200 dental practitioners who were registered with the Dental Council were included for the study. We designed a self-structured, closed ended questionnaire for the study which included demographic, professional characteristics and knowledge regarding usage and type of topical anesthesia. The reply of the dentists was tabulated and subjected to statistical analysis. **Results:** We observed that Lidocaine gel was the most commonly used topical anesthesia. Most least used anesthetic was Lidocaine patch. Benzocaine was observed to be least effective by the dentists. It was observed that majority of dentists used topical anesthesia for 30 seconds to 1 minute. Least number of patients used anesthetic for more than 2 minutes. **Conclusion:** Within the limitations of the present study, it can be concluded that Lidocaine gel was the most commonly used topical anesthetic with good effectiveness. Also, majority of dentists used topical anesthetic for 30 sec to 1 minute.

**Keywords:** Topical anesthesia, Lidocaine, LA, dentists.

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## INTRODUCTION

The word anesthesia is a compound word from the Greek words an- (“without”) and aesthesis (“sensation”). Anesthesia is broadly divided into general and local anesthetics. Local anesthesia refers to a loss of sensation caused by a reversible blockade of nerve conduction around the site of application. In dentistry, local anesthetics are administered via a variety of anesthetic techniques that are classified according to their specific effects as (1) conduction anesthesia, (2) infiltration anesthesia, (3) topical anesthesia or surface anesthesia.<sup>1</sup> The majority of practicing dentists use the traditional aspirating syringe and needle, first introduced by Cook nearly 150 years ago.<sup>2</sup> Using a needle causes mechanical trauma whilst penetrating oral mucosal tissues, initiating pain in the patient before anaesthetic itself is given.<sup>3</sup> Newer technologies have been developed that can help the patient with reduced injection-pain and minimal adverse effect prior to infiltration of anaesthetic agent.<sup>4</sup> Researchers in the last decades have focused on developing alternative delivery systems or practices to provide anaesthesia.<sup>5</sup> Topical anesthetics target free nerve endings in the mucosa and block nerve impulse conduction thereby producing temporary loss of sensation at the site of administration. The pharmacological and psychological effects of topical anesthesia application prior to administration of LA have variable outcomes.<sup>6</sup> Hence, the present study was conducted to assess knowledge and attitude of usage and type of topical anesthesia among dentists.

## MATERIALS AND METHODS

For the study, 200 dental practitioners who were registered with the Dental Council

were included for the study. An informed written consent was obtained from the participants after explaining them the protocol of the study. We designed a self-structured, closed ended questionnaire for the study 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 reply of the dentists was tabulated and subjected to statistical analysis.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

## RESULTS

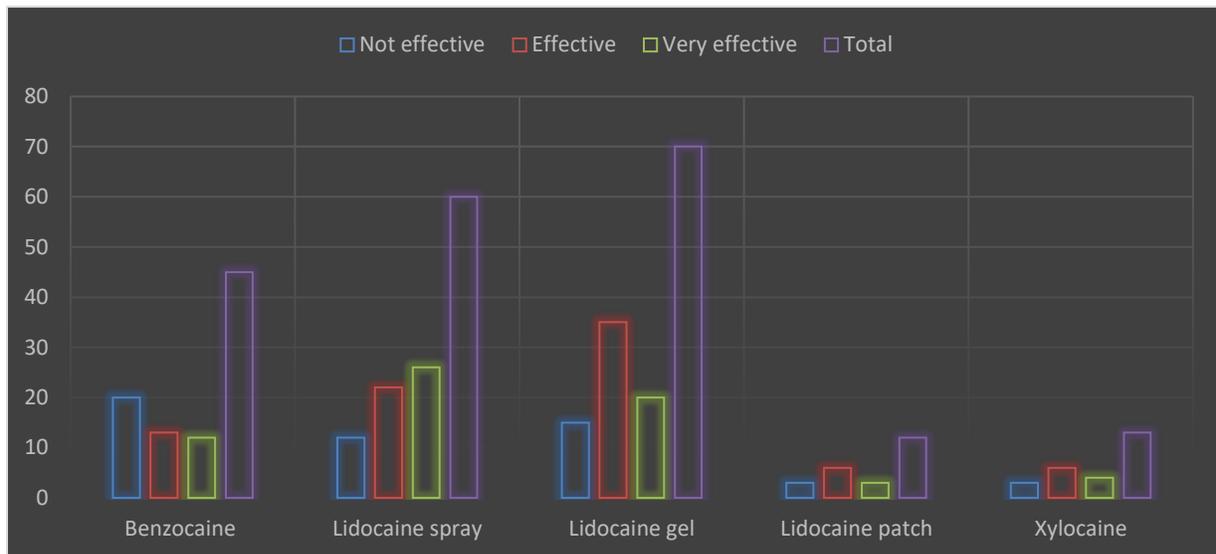
In the present study, a total of 200 dentists were included. Table 1 shows distribution of dentists using various types of topical anesthesia and their effectiveness. We observed that Lidocaine gel was the most commonly used topical anesthesia. Most least used anesthetic was Lidocaine patch. Benzocaine was observed to be least effective by the dentists. Table 2 shows time taken after applying a topical anesthetic before procedure. It was observed that

majority of dentists used topical anesthesia for 30 seconds to 1 minute. Least number of

patients used anesthetic for more than 2 minutes.

	<b>Benzocaine</b>	<b>Lidocaine spray</b>	<b>Lidocaine gel</b>	<b>Lidocaine patch</b>	<b>Xylocaine</b>
Not effective	20	12	15	3	3
Effective	13	22	35	6	6
Very effective	12	26	20	3	4
Total	45	60	70	12	13

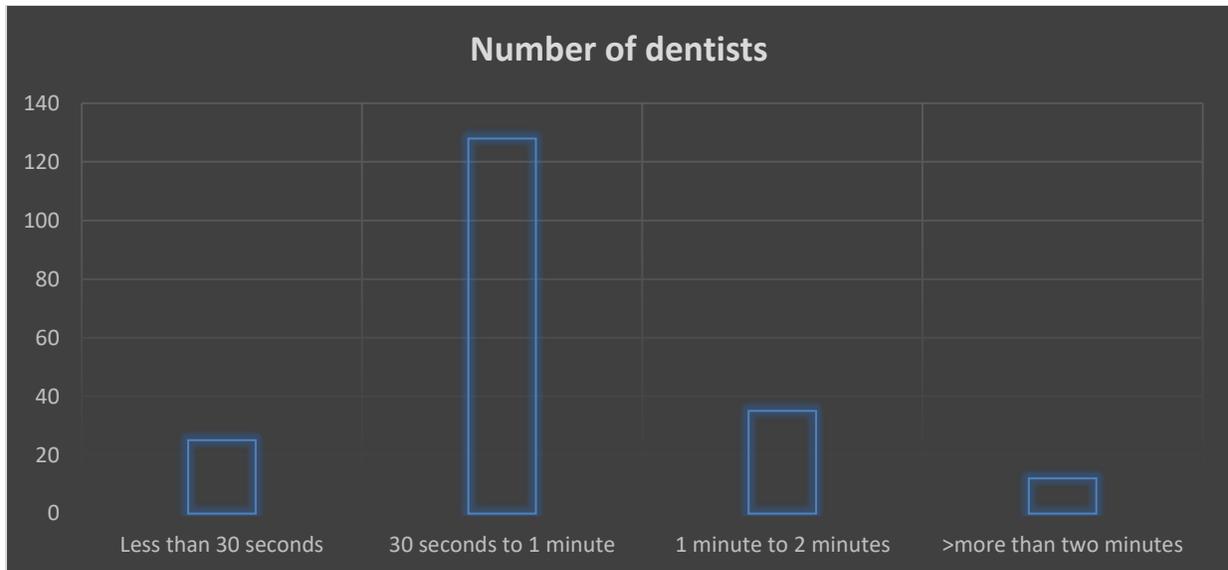
**Table 1:** Distribution of dentists using various types of topical anesthesia and their effectiveness.



**Fig 1: Effectiveness of different types of anesthesia**

<b>Time for anesthetic application</b>	<b>Number of dentists</b>
Less than 30 seconds	25
30 seconds to 1 minute	128
1 minute to 2 minutes	35
>more than two minutes	12

**Table 2:** Time taken after applying a topical anesthetic before procedure



**Fig 2:** Time for anesthetic application by dentists

## DISCUSSION

In the present study, we observed that Lidocaine gel was the most commonly used topical anesthesia. Most least used anesthetic was Lidocaine patch. Benzocaine was observed to be least effective by the dentists. Furthermore, majority of dentists used topical anesthesia for 30 seconds to 1 minute. Least number of patients used anesthetic for more than 2 minutes. The results were statistically significant ( $p < 0.05$ ). The results were compared with previous studies from the literature and were found to be consistent with the results. Rehman N et al <sup>7</sup> compared the effect of topical anesthesia against the use of no topical agent on pain of needle penetration and local anesthesia deposition during buccal infiltration in anterior maxilla. 100 adult participants were randomly allocated to the benzocaine group (received 20% benzocaine gel) and no benzocaine group (received no topical agent) prior to buccal infiltration in maxillary anterior teeth. A 27-gauge needle was used to deposit 2%

lidocaine with 1:100,000 epinephrine. Pain of needle penetration and local anesthesia deposition was recorded separately using an 11-point Numeric Pain Rating Scale. Results showed that although 20% benzocaine significantly reduced pain on needle penetration during buccal infiltration in maxillary anterior teeth, the difference was small and the clinical significance is not clear. They concluded that topical anesthetic did not affect pain of local anesthetic deposition. Martin MD et al <sup>8</sup> investigated the pharmacologic and psychologic processes that may play a role when topical anesthesia is used to reduce the pain of dental injections. Subjects were assigned to one of two belief manipulation conditions: one-half of the subjects were led to believe they would receive a placebo, while the remaining subjects were told they would receive the active agent. In reality, all subjects received two separate injections at contralateral sites, one preceded by a placebo and the other by a 20% benzocaine gel. The order in which injections were given was associated with differences in

pain report. Second injections were more painful than first injections. Whether injections were preceded by an active or placebo agent did not alter subjects' experienced pain. Likewise, the belief manipulation did not affect the pain report. However, subjects who believed they would receive the active agent anticipated significantly less pain than subjects who thought they would receive placebo. The widespread belief that topical anesthetics are effective at reducing injection pain may serve to reduce the anticipatory anxiety associated with an impending dental injection, thus making the injection experience less aversive.

DiMarco AC et al<sup>9</sup> compared the effectiveness of an application method of a fast-acting refrigerant topical agent to a 20% benzocaine gel topical. In a split-mouth design, right and left anterior middle superior alveolar injections (N = 30) were administered with a 27-gauge needle at least 24 hours apart with preinjection topicals. Using a cotton-tipped applicator, a refrigerant topical was applied for 5 seconds and 20% benzocaine gel for 2 minutes on opposite sides at 2 separate appointments. Subjects self-reported pain perception after each injection using a visual analog scale (VAS). The mean VAS ratings demonstrated no significant difference between the 5-second application of the refrigerant and the 2-minute application of 20% benzocaine topical gel anesthetic. Fifty-seven percent of the subjects reported greater pain reduction with the refrigerant, 33% reported greater pain reduction with 20% benzocaine, and 10% reported no difference. Results suggest the described method of application of a refrigerant as an oral topical anesthetic has a faster onset and provides similar benefit in pain reduction compared with 20%

benzocaine gel. Kosaraju A et al<sup>10</sup> determined the effectiveness of a refrigerant compared with that of a topical anesthetic gel in reducing the pain experienced during a posterior palatal anesthetic injection. Sixteen participants received a five-second application of a refrigerant and a two-minute application of a topical anesthetic gel in the posterior palatal area before an injection of a local anesthetic solution was administered with a 30-gauge needle. The group receiving the refrigerant had a mean VAS score of 17.7 +/- 15.3 mm, and the group receiving the topical anesthetic gel had a VAS score of 26.2 +/- 18.0 mm. They concluded that the use of the refrigerant compared with the use of topical anesthetic gel significantly reduced the pain experienced during administration of local anesthetic injections.

## CONCLUSION

Within the limitations of the present study, it can be concluded that Lidocaine gel was the most commonly used topical anesthetic with good effectiveness. Also, majority of dentists used topical anesthetic for 30 sec to 1 minute.

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