

# Assessment of Knowledge on Periodontal Ligament Injection Among Dental Students in Khammam - A Cross Sectional Study

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**Abstract: Aim:** The purpose of present study is to assess the knowledge on periodontal ligament injection among dental students.

**Methodology:** A Questionnaire consisting of 15 questions was distributed among 204 dental students. Survey participants were asked about commonly given injection techniques for extraction, awareness about periodontal ligament injection, alternative names of periodontal ligament injection, its technique, apparatus used, its point of entry, surfaces involved, effect of periodontal ligament injection on pain control and management of patients, patient's response, Indications, Contraindications, reasons for preferring PDL injection over conventional injection technique.

**Conclusion:** From the study it is clear that most of the students are aware of periodontal ligament injection, but they only used it when routine Nerve block fails and given on gingival sulcus on surfaces with special injection apparatus, thus providing beneficial effect on pain control and management of patients

**Keywords:** Periodontal Ligament Injection

## 1. Introduction

Pain is an emotional experience, which is unpleasant, sensory in nature and associated with potential tissue damage [4]. Many patients often correlate the terms pain dentistry. The fear of dental pain very strong in some patients which make them to skip dental appointments [2]. Hence efficient pain management is important for Dentist to successfully complete dental procedure with in time provided and this helps in providing comfort to patient [2].

A local anesthesia which is administered painlessly & efficaciously is absolutely important in management of pain and fear induced anxiety stress [4]. Local anesthesia usually affects patient feedback and their dental treatment [5]. The periodontal ligament injection is used when routine nerve block fails or if dentist requires only a short duration of anesthesia and when patient wants to avoid the lip and tongue numbness associated with mandibular block injections [3].

Periodontal ligament injection technique is most commonly

used supplemental injection technique because it is efficient and easy to perform, & most preferred technique in procedures involving the mandible. This procedure uses minimal anesthetic dosage [2]. This technique is also known as intraligamentary or periodontal injection technique, is introduced in early 20th century. This technique had standard dental syringe with placement of hollow bore metal needle on gingival sulcus, which requires deposition of 0.2 ml of local anesthetic solution for each root [4]. This technique usually reduces damage to vital structures present around teeth PDL injection technique is commonly used in pediatric and disabled patients when there is concern of post-operative trauma to lip and tongue and incase of hemophilic patients [1], [3]. Tsirli's et al conducted comparative studies of conduction and intraligamentary anesthesia in extraction of mandibular molar. They found no statistically significant difference in complication of dry socket type [2].

Galali performed a trial to find whether injection needle of anesthetic solution have any deleterious effect on the periodontal apparatus; no bone or cemental damage was found to be caused by these [2].

To reduce the discomfort caused by injection of anesthetic solution Mechen suggests the use of LA with cream or spray [2].

The present study was aimed to assess the knowledge of periodontal ligament injection among the dental students and their awareness of anesthesia techniques, which may help in management of pain in patients during routine dental procedures and thus improving the treatment services provided to people

## 2. Methodology

**Study design:** A Cross sectional questionnaire based study was conducted among final year, interns, post graduate students of Mamata Dental college students from 1st July 2019 to 31st July 2019 for a period of 4 weeks. Formal approval was taken

from head of the department, department of public health dentistry.

For Pilot study a self-prepared questionnaire was prepared based on previous studies conducted by G. Vinitha and Dr. Santosh. And the questionnaires are distributed among 20 students of Mamata dental college to know the reliability and feasibility of study. All final year, interns and postgraduate 1st year students, those who are willing to participate on the day of study were included in study.

All 1st year, 2nd year and 3rd year students and those who are not interested to participate were excluded in study.

The study was conducted among 204 dental students, questionnaires were distributed to final years, intern, post graduate 1st year students during their working hours in Mamata dental hospital i.e., from 9.00AM to 4.00AM. Questionnaire consists of questions regarding demographic data that includes gender, age, year of study. It also consists of 15 questions covering all aspects of periodontal ligament technique regarding its awareness, alternative names of this technique, apparatus used, its point of entry, technique followed, patient's response on its application, its effectiveness, Indications, contraindications, reasons for preferring PDL Injection. All these questions are provided with multiple choice answers and students were asked to select the best option for given questions. All the data collected was entered into excel sheet by providing codes respectively for each aspect & sent for analysis purpose

### 3. Statistical analysis

Statistical analysis was done by using SPSS 25. Descriptive statistics were performed; Chi- square test was used to find the association among categorical variables.

### 4. Results

	N	minimum	maximum	mean	Std. deviation
Age	204	21	28	23.12	1.356
Valid N	204				

The number of students included in the study is 204, mean age of study group is 23.12 and standard deviation is 1.356, majority of them are females 58.8%, and interns 57.6.

	frequency	percent	Valid percent	Cumulative percent
infiltration	127	62.3	62.3	62.3
Nerve block	73	35.8	35.8	98.0
PDL injection	4	2.0	2.0	100.0
total	204	100.0	100.0	

The most common injection technique used by students for extraction purpose is infiltration 62.3%, while 35.8% used nerve block and 2% of students used PDL injection technique. Statistically significant difference was not observed.

	frequency	percent	Valid percent	Cumulative percent
yes	159	77.9	77.9	77.9
no	25	12.3	12.3	90.2
unaware	20	9.8	9.8	100.0
total	204	100.0	100.0	

Most of the students 77.9% think that supplemental injection technique have additional beneficial effect on pain control and management of patients & 12.3% of students didn't agree with it and 9.8% of students are unaware of beneficial effect of PDL injection. Statistically significant difference was observed among different academic years.  $P < 0.05$  (0.001).

	Frequency	Percent	Valid percent	Cumulative percent
PDL injection	24	11.8	11.8	11.8
infiltration	16	7.8	7.8	19.6
Nerve block	40	19.6	19.6	39.2
Combination of above	124	60.8	60.8	100.0
total	204	100.0	100.0	

According to 11.8% participants PDL injection is more effective technique for extracting tooth, 7.8% considered infiltration and 19.6% participants considered nerve block as most effective method & majority of participants almost 60.8% considered combination of above technique is more effective. Statistically significant difference was observed  $P < 0.05$  (0.014).

	frequency	Percent	Valid percent	Cumulative percent
Hemophilic patient	8	3.9	3.9	3.9
Pediatric and disabled patients	24	11.8	11.8	15.7
When routine nerve block fails	53	26.0	26.0	41.7
All the above	119	58.3	58.3	100.0
Total	204	100.0	100.0	

Regarding indications of PDL injection, 3.9% of participants use in hemophilic patients, 11.8% use in pediatric & disabled patients and 26.0% use this technique when routine nerve block fails, majority of students 58.3% of them answered all of the above as indications for PDL injection. Statistically significant difference was noticed above different academic years  $P < 0.05$  (0.003).

	Frequency	Percent	Valid percent	Cumulative percent
Infection or inflammation at site of injection	32	15.7	15.7	15.7
Primary teeth when permanent tooth bud is present	12	5.9	5.9	21.6
Both the above	148	72.5	72.5	94.1
None of the above	12	5.9	5.9	100.0
total	204	100.0	100.0	

While coming to contraindications of PDL injection, according to 15.7 % student's infection at the site of injection, 5.9 % of students contraindicated it in primary teeth if permanent tooth bud is present, 72.5 % answered both the above and 5.9% answered none of the above. Statistically significant difference was observed among different academic

years  $P < 0.05$  (0.003).

	Frequency	percent	Valid percent	Cumulative percent
To avoid post-operative trauma to soft tissues	28	13.7	13.7	13.7
To avoid bilateral IANB in 2 quadrants	20	9.8	9.8	23.5
Rapid onset of profound pulpal anesthesia	16	7.8	7.8	31.4
All the above	140	68.6	68.6	100.0
total	204	100.0	100.0	

At last coming to reasons y dentists prefer PDL injection, 13.7% participants prefer it to avoid post-operative trauma to soft tissues, 9.8 % of students use it to avoid bilateral IANB, 7.8% prefer this because of its rapid onset of profound pulpal anesthesia, 68.6 % students answered all the above option as best reason for preferring PDL injection. Statistically significant difference was observed among different academic years  $P < 0.05$ .

### 5. Discussion

Pain control is very important for any oral surgical procedure to be successful. The fear of dental pain is so strong in some patients that makes them not to report for treatment. LA which is administered without pain cause reduced anxiety and aids in management of pain. Commonly used LA techniques such as Infiltration and mandibular nerve block usually provides acceptable results. But in some conditions like infected or inflamed pulp these routine Nerve block or Infiltration techniques may fail and require Supplemental Injection techniques. One among them is Intraligamentary or periodontal ligament injection.

Although the study was conducted among individuals of same level of education, participation of female students is more than that of males & interns were found to be dominant respondents among study groups.

Regarding the type of anesthetic technique used commonly for extraction 62.3% of participants revealed Infiltration as commonly used technique because of high delivery rate of Infiltration technique. 35.8% of participants revealed that IANB is commonly used LA technique, this agreed with HASS in 2011 who reported that IANB is commonly used LA technique for various applications throughout modern dentistry. 2% of

participants revealed using pdl injection while performing extraction. Based on the results of 80.9% of participants were familiar with pdl injection & about 77.5% used it as a Supplemental technique, this agreed with MALAMED (7) who evaluated using the PDL injection as a Supplemental Injection instead of IANB and since then PDL injection have been used as primary and Supplemental Injection technique.

Coming to Indications of PDL injection, 58.3% of participants says that PDL is indicated in case of hemophiliacs, pediatric & disabled patients and most commonly when routine Nerve block fails, which is in agreement Walton et. al. [8] and and smith [9] who reported that PDL is been used overcome failed conventional methods, it is indicated in hemophiliacs patients to avoid excessive bleeding and Indicated in Gediatric and pediatric patients because to avoid post-operative trauma to tongue or lip.

### 6. Conclusion

From the above survey, it is clear that most students are aware of PDL injection, but they only used it when routine Nerve block fails, It is given on gingival sulcus on 2 surfaces with special injection apparatus thus providing beneficial effect on pain control and management of pain, majority of students know about Indications, Contraindications and Reasons for preferring PDL injection

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