

Content available at: <https://www.ipinnovative.com/open-access-journals>

International Journal of Oral Health Dentistry

Journal homepage: [www.ijohd.org](http://www.ijohd.org)

## Original Research Article

## Comparing effectiveness of infiltration, and inferior alveolar nerve anesthesia for extraction of posterior mandibular teeth

Harpuneet Kaur<sup>1,\*</sup>, Rashmeet Kaur<sup>2</sup>, Deepika<sup>3</sup>, Prenika Sharma<sup>4</sup><sup>1</sup>Dept. of Oral and Maxillofacial Surgery, Sri Sukhmani Dental College and Hospital, Dera Bassi, Punjab, India<sup>2</sup>Dept. of Oral Pathology, Sri Sukhmani Dental College and Hospital, Dera Bassi, Punjab, India<sup>3</sup>Dept. of Prosthodontics, Sri Sukhmani Dental College and Hospital, Dera Bassi, Punjab, India<sup>4</sup>Dept. of Oral Medicine and Radiology, Sri Sukhmani Dental College and Hospital, Dera Bassi, Punjab, India

## ARTICLE INFO

## Article history:

Received 27-07-2022

Accepted 07-08-2022

Available online 03-09-2022

## Keywords:

Inferior alveolar nerve block

Infiltration

Oral anesthesia

Lidocaine

## ABSTRACT

The present study compares the effectiveness of inferior alveolar nerve block and infiltration in the extraction of posterior mandibular teeth. 90 patients were divided into two groups. Group 1 included 45 patients and for each tooth, two injections (0.6 ml out of 1.8 ml of 2% lidocaine from one dental cartridge with 1:80000 adrenaline) were administered, one Local Anesthetic injection was given parallel to the long axis of the tooth in the depth of buccal sulcus with short needle and dental syringe. The second injection was delivered to the lingual vestibule of the mouth's floor to anaesthetize the soft and hard lingual tissue with short needle and dental syringe, whereas Group 2 included 45 patients and were given Inferior Alveolar Nerve Block (1.5 ml of 2% Lidocaine) and Long Buccal nerve Infiltration (0.3ml of 2% Lidocaine). In our study, we found 78% patients was pain free and 22% was feeling pain during tooth extraction in patients who were given infiltration, whereas patients in which Inferior alveolar nerve block was given, 89% patients was pain free and 11% were feeling pain during tooth extraction. 94% of males and 85% of females experienced no pain, whereas 6% of males and 15% of females felt pain during the extraction. The present study suggests that Infiltration can be used as an alternative approach to inferior alveolar nerve block during the extraction of Mandibular posterior teeth.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprint@ipinnovative.com](mailto:reprint@ipinnovative.com)

## 1. Introduction

Chemical substances known as local anaesthetics are primarily pharmacologically active by inhibiting the excitation–conduction pathway in peripheral nerves.<sup>1</sup> Inferior alveolar nerve block (IANB) is used to numb the lower lip, mandibular gingiva, and mandibular teeth. In the extraction of lower teeth and other minor procedures performed on the mandible, the IANB technique is the most often used nerve block.<sup>2</sup> Complications associated with the inferior alveolar nerve block range from being common to being rare, and they include pain and trismus

brought on by tearing the mucosa during insertion or even by the withdrawal of the needle, needle breakage at that point of injection, and facial paralysis brought on by the deposition of the anaesthetic solution in the parotid region. This issue primarily arises when the needle is directed more posteriorly toward the posterior border of the mandible. Hematoma may also form after the intravascular injection of anaesthetic solution and as a result of blood vessel injury in the area to be numbed.<sup>3</sup> The most popular method Failure of inferior alveolar anaesthesia results from incorrect needle placement caused by misplacement of the mandible foramen in anatomical structures. Failure to produce profound anaesthesia is caused by the absence of

\* Corresponding author.

E-mail address: [drkaur071993@gmail.com](mailto:drkaur071993@gmail.com) (H. Kaur).

a certain anatomic bone landmark, changes in the ramus width and height, and the position of the inferior alveolar nerve foramen. According to some publications, inferior alveolar nerve blocks fail about 20–25 percent of the time.<sup>4</sup> Mandibular block failure rates vary between studies and show us there is no guarantee of success. Based on clinical experience and academic articles, local anaesthetic has a significantly higher efficacy in the maxilla. The majority of the difference between the mandible and maxilla is likely caused by the cortical plates of the mandible being thicker, denser, and having less porosity, which allow a volume of local anaesthetic to be diffused into the cancellous bone in case one attempts a buccal infiltration, for example. The methods utilized to achieve local anaesthesia are another factor. In order to achieve local anesthesia in the mandible, it is primarily necessary to try to place a volume of local anaesthetic close to the mandibular nerve before it enters the mandible. In the maxilla, the most suitable technique would be a buccal infiltration anaesthesia close to the level of the apices of the teeth.<sup>5</sup> This study compares the effectiveness of inferior alveolar nerve block and infiltration in the extraction of posterior mandibular teeth.

## 2. Materials and Methods

In this prospective cohort clinical study, 90 patients with age range between 18-75 years, who came to the Department of Oral and Maxillofacial Surgery, Sri Sukhmani Dental College and Hospital, Punjab, India for extraction of mandibular molars and premolars were included. The following Inclusion criteria were established: Mandibular Molar and Premolar teeth, grossly decayed molar and premolar teeth, root stumps, American society of anesthesiologist classification I & II patients, therapeutic extractions, whereas the Exclusion criteria included :patients allergic to local anesthesia, infected teeth (Active infection; where the local anesthesia is not that effective and 3 days antibiotic course is required before the extraction), grade 2 and grade 3 mobile teeth, patients already taking medications which influences the anaesthetic assessment, pregnancy, systemic pathologies that contraindicate the use of local anaesthetics with vasoconstrictors. The consent was taken from each patient. Total of 90 patients were divided into two groups. Group 1 included 45 patients and for each tooth, two injections (0.6 ml out of 1.8 ml of 2% lidocaine from one dental cartridge with 1:80000 adrenaline) were administered, one Local Anesthetic injection was given parallel to the long axis of the tooth in the depth of buccal sulcus with short needle and dental syringe. The second injection was delivered to the lingual vestibule of the mouth's floor to anaesthetize the soft and hard lingual tissue with short needle and dental syringe, whereas Group 2 included 45 patients and were given Inferior Alveolar Nerve Block (1.5 ml of 2% Lidocaine) and Long Buccal nerve Infiltration (0.3ml of 2% Lidocaine).

The one same surgeon gave anesthesia and did extractions of all the patients included in the study. After checking the success of anesthesia subjectively and objectively, a visual analogue scale measuring 100 mm was used to rate the pain experienced “during extraction”. On a 100-mm VAS, 0 to 4mm represented No Pain, 5 to 100 mm represented Pain (5 to 44 mm represented Mild pain, 45 to 74 mm represented Moderate pain, 75 to 100 mm represented Severe pain).<sup>6</sup> After the extraction, the patient received post op instructions. If pain was felt in group 1—mild, moderate, or severe—the treatment was stopped, and the patient received inferior alveolar nerve block.

## 3. Result

A total of 90 patients with age range between 18-75 years, out of which 51 were males and 39 were females, who came to the Department of Oral and Maxillofacial Surgery, Sri Sukhmani Dental College and Hospital, Punjab, India for extraction of posterior teeth were included in this study. Chi-square test was used for analysis of the data with significance level at  $P \leq 0.05$ .

Table 1 shows the data related to number of patients who experienced Pain during dental extraction in relation to anesthetic technique (n=90).

**Table 1:**

Group	Pain	No pain
Group 1 (Infiltration)	10	35
Group 2 (Inferior Alveolar Nerve Block)	5	40

p-value 0.157<sup>ns</sup>

chi-square test, ns=not significant

P-value was 0.157 and it was not < 0.05. So it was not significant

Table 2 shows the data related to number of patients who experienced Pain during dental extraction in relation to gender (n=90)

**Table 2:**

Group	Pain	No pain
Male	3	48
Female	6	33

p-value 0.136<sup>ns</sup>

chi-square test, ns=not significant

P-value was 0.136 and it was not < 0.05. So it was not significant

## 4. Discussion

Using a direct method, the practitioner performs the typical IANB treatment by inserting their thumb intra-orally at the deepest concavity of the anterior ascending ramus. The location of injection is situated halfway between the pterygomandibular raphe and the middle of the thumb nail. To achieve the appropriate bone end point injection

location, the needle is moved 15–25 mm in a straight line parallel to the occlusal plane of the contralateral premolars.<sup>7</sup> The mandibular bone is supposed to be too compact and dense, and because of this, it is believed that local anaesthetic cannot be dispersed into the mandibular medullary area by supraperiosteal infiltration. In a study conducted by Hussein, R.M., Muhammad, D.N., & Omar, O.A.<sup>8</sup> utilizing infiltration to extract non-vital posterior teeth resulted in total pain relief for 15 of the 44 patients. In our present study, we found 78% patients was pain free and 22% was feeling pain during tooth extraction in patients who were given infiltration, whereas patients in which Inferior alveolar nerve block was given, 89% patients was pain free and 11% were feeling pain during tooth extraction. According to Madeira et al., 87.3 to 96.2 percent of the specimens examined had accessory foramina in the human jaw.<sup>9</sup> Based on our results and above mentioned findings, at the posterior region of the mandible, successful supraperiosteal infiltration anesthesia may be due to the possibility of local anesthesia diffusion within the bony structures.<sup>8</sup> The findings of study conducted by Rajendran B, Thaneraj SP, made it abundantly evident that infiltration should be chosen over Inferior alveolar nerve block because it was more quickly effective and had higher success rates in achieving profound local anaesthesia for the therapeutic removal of mandibular premolars.<sup>10</sup> In our present study, it is found that Infiltration can be used as an alternative approach to inferior alveolar nerve block during the extraction of Mandibular posterior teeth. According to the study conducted by Haque M M, Anisuzzaman M M, Hasan S, Adnan N., ten patients out of 113 in the male group experienced discomfort during tooth extraction, compared to 103 patients out of 113 who reported no pain. Again, 79 out of 87 patients experienced no pain, whereas 6 out of 87 patients in the female group experienced discomfort during tooth extraction.<sup>11</sup> In our present study, 94% of males and 85% of females experienced no pain, whereas 6% of males and 15% of females felt pain during the extraction.

## 5. Conclusion

Infiltration can be used as an alternative approach to inferior alveolar nerve block during the extraction of Mandibular posterior teeth.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

## References

1. Covino BG, Giddon DB. Pharmacology of local anesthetic agents. *J Dent Res.* 1981;60(8):1454–9.
2. Thangavelu K, Kannan R, Kumar NS. Inferior alveolar nerve block: Alternative technique. *Anesth Essays Res.* 2012;6(1):53–7.
3. Khalil H. A basic review on the inferior alveolar nerve block techniques. *Anesth Essays Res.* 2014;8(1):3–8.
4. Thangavelu K, Kannan R, Kumar NS, Rethish E, Sabitha S, Sayeeganes N. Significance of localization of mandibular foramen in an inferior alveolar nerve block. *J Nat Sci Biol Med.* 2012;3(2).
5. Badr N, Aps J. Efficacy of dental local anesthetics: A review. *J Dent Anesth Pain Med.* 2018;18(6):319–32.
6. Available from: [https://www.jpain.org/article/S1526-5900\(03\)00716-8/pdf#relatedArticles](https://www.jpain.org/article/S1526-5900(03)00716-8/pdf#relatedArticles).
7. Alhindi M, Rashed B, Alotaibi N. Failure rate of inferior alveolar nerve block among dental students and interns. *Saudi Med J.* 2016;37(1):84–9.
8. Hussein RM, Muhammad DN, Omar OA. Comparison between infiltration and inferior alveolar nerve block anesthesia in extraction of non-vital mandibular posterior teeth (prospective clinical study). *Zanco J Med Sci.* 2015;18(3):822–5.
9. Madeira MC, Percinoto C, Graças MD, Silva M. Clinical significance of supplementary innervation of the lower incisor teeth: a dissection study of the mylohyoid nerve. *Oral Surg Oral Med Oral Pathol.* 1998;46(5):608–14.
10. Rajendran B, Thaneraj SP. Comparison of infiltration (INF) and inferior alveolar nerve block (IANB) injection techniques in bilateral therapeutic removal of mandibular premolars. *J Dent Res Dent Clin Dent Prospects.* 2021;15(4):269–72.
11. Haque MM, Anisuzzaman MM, Hasan S, Adnan N. Comparison between infiltration and inferior alveolar nerve block anesthesia for extraction of Advance periodontitis of mandibular molars. *Update Dent Coll J.* 2020;10(1):13–5.

## Author biography

**Harpuneet Kaur**, Tutor

**Rashmeet Kaur**, Senior Lecturer

**Deepika**, Reader

**Prenika Sharma**, Senior Lecturer

**Cite this article:** Kaur H, Kaur R, Deepika, Sharma P. Comparing effectiveness of infiltration, and inferior alveolar nerve anesthesia for extraction of posterior mandibular teeth. *Int J Oral Health Dent* 2022;8(3):256-258.