



COMPARATIVE EVALUATION BETWEEN INFILTRATION AND INFERIOR ALVEOLAR NERVE ANESTHESIA IN EXTRACTION OF POSTERIOR MANDIBULAR TEETH

Bhoosha Ambani^{1*}, Sanjay Yadav² and Shrikant Patel³

¹BDS, Faculty of Dental Science, Dharmsinh Desai University, Nadiad, Gujarat.

²Third Year Post-Graduate Student, Department of Oral & Maxillofacial Pathology, Government Dental College And Hospital, Ahmadabad, Gujarat.

³Reader, Department of Oral Pathology, Pacific Dental College, Udaipur, Rajasthan.

*Corresponding Author: Bhoosha Ambani

BDS, Faculty of Dental Science, Dharmsinh Desai University, Nadiad, Gujarat.

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ABSTRACT

Background and Aim: The inferior alveolar nerve block is the most frequently used injection technique for achieving local anesthesia for mandibular restorative and surgical procedures of the posterior region. Infiltration anesthesia for the posterior region of the mandible has been routinely avoided because of its questionable effectiveness related to the dense cortical bone of the mandible. This study compares the effectiveness of inferior alveolar nerve block and infiltration in the extraction of posterior mandibular teeth. **Material and Methods:** In this prospective study, 100 patients with age range between 18-75 years, who came to the Tertiary care Institute for extraction of mandibular molars and premolars were included. Total of 100 patients were divided into two groups. Group 1 included 50 patients and for each tooth, two injections were administered, whereas Group 2 included 50 patients and were given Inferior Alveolar Nerve Block and Long Buccal nerve Infiltration. **Results:** 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, 88% patients was pain free and 12% were feeling pain during tooth extraction. **Conclusion:** Infiltration can be used as an alternative approach to inferior alveolar nerve block during the extraction of Mandibular posterior teeth.

KEYWORDS: Infiltration, Inferior Alveolar Nerve Block, Long Buccal nerve Infiltration, Mandibular posterior teeth.

INTRODUCTION

Local anesthesia is the most frequently used treatment procedure for pain control through medical and dental procedures.^[1] However, the Local anesthesia injection oneself has been expressed as the only recognize painful factor of dental procedure, and the combined fear of this injection is usually designed a factor in avoiding dental treatment.^[2] Various studies have measured factors certain fear, as well as success and capability of Local anesthesia injections, including tissue dispensability, speed of injection,^[3] solution temperature,^[4] and patient characteristics.^[5] In addition, the type of procedure has been expressed to have an important role in positive pain anticipated at the time of injection or extraction.^[6]

Pain control is an important part of dentistry. The inferior alveolar nerve block is the most frequently used injection technique for achieving local anesthesia for mandibular restorative and surgical procedures of the posterior region. Successful inferior alveolar nerve block involves a degree of difficulties that makes the injection stressful for both the clinician and the patient.^[7] Major

postoperative complications may occur with the use of block anesthesia of the inferior alveolar nerve which includes: Prolonged mandibular anesthesia, during this time the patient may injure his or her tongue or lip in a variety of ways, systemic toxicity from iatrogenic intra-arterial injection of local anesthetic solution, injury to the inferior alveolar nerve,^[8] difficulty in achieving anesthesia because of anatomic variations, deep and invasive needle penetration; parasthesia; muscle trismus; hematoma formation; high incidence of positive aspiration; and difficulty in hemostasis in patients with bleeding disorders.^[9]

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 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.^[10] 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.^[11] This study compares the effectiveness of inferior alveolar nerve block and infiltration in the extraction of posterior mandibular teeth.

MATERIALS AND METHODS

In this prospective study, 100 patients with age range between 18-75 years, who came to the Tertiary care Institute 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 100 patients were divided into two groups. Group 1 included 50 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 50 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).^[12] 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.

Statistical Analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

RESULTS

A total of 100 patients with age range between 18-75 years, out of which 55 were males and 45 were females, who came 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=100).

Table 1: Number of patients who experienced Pain during dental extraction in relation to anesthetic technique.

Groups	Pain	No Pain	P value
Group 1 (Infiltration)	11	39	0.10
Group 2 (Inferior Alveolar Nerve Block)	6	44	

Statically significant difference at $p=0.05$

Test applied chi-square test

DISCUSSION

Inferior alveolar nerve is a branch from the posterior division of the mandibular nerve and enters the mandibular canal to supply the teeth of the lower jaw and emerges through the mental foramen (mental nerve) to supply the skin of the chin. Before entering the canal, it gives off the mylohyoid nerve which supplies the mylohyoid muscle and the anterior belly of the digastric

muscle. Lingual nerve which is also a branch from the posterior division of the mandibular nerve descends in front of the inferior alveolar nerve and enters the mouth, it then runs forward on the side of the tongue and crosses the submandibular duct. In its course, it is joined by the chorda tympani nerve and it supplies the mucous membrane of the anterior two thirds of the tongue and the floor of the mouth. It also gives off preganglionic

parasympathetic secretomotor fibers to the submandibular ganglion. Buccal nerve which branches from the anterior division of the mandibular nerve supplies the skin and the mucous membrane of the cheek.^[13]

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.^[14] 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.^[15] 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, 88% patients was pain free and 12% 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.^[16] Pogrel et al reported that division of the mental nerve reenter the labial (lateral) surface of the mandible to supply lower incisors. Based on the beyond considered agreement and our results, the deed of supraperiosteal infiltration anesthesia at the posterior region of the mandible might be akin with the possibility of diffusion of local anesthetic solution within the bony structures.^[17]

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.^[15] 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.^[18] 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.

CONCLUSION

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

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