

**STUDY ON THE USE OF INJECTION TECHNIQUES OTHER THAN DIRECT NERVE BLOCK FOR ANAESTHETISING INFERIOR ALVEOLAR NERVE****PRITHI.R¹ AND LOGANATHAN SELVARAJ²**

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ABSTRACT

The aim of this study was to find out the injection technique that is most commonly used among the dentist to anaesthetize inferior alveolar nerve. Commonly, the classical nerve block and infiltration injection techniques are being used by the dentists. Other than the classical method, specific injection techniques are used for certain reasons among the dentists. This study was done to evaluate which injection method was most and the least preferred by dentist. This study was carried out by an observational assessment of the injection techniques. This study was conducted at among dentists who are practicing in Chennai. About 70 questionnaires were distributed to 70 specialists, questionnaire contained questions related to the type of inferior alveolar nerve block technique the dentists opted for and they were asked to grade them as most commonly, commonly and rarely used. Also they were asked to provide reasons as to why the technique was preferred and reason for non preference. The result of the survey was that, dentist preferred using Direct inferior alveolar nerve block (48%) more commonly and the least preferred technique was the extra oral technique. The study had a sample size of 70. Questionnaire was distributed among the 70 individuals out of the total, direct technique was most commonly preferred by 48% of dentists, indirect technique was followed with 41.4%, Gowgates was preferred by 2.8%, Vazirani Akinosi was preferred by 1.4%. The least preferred injection technique was the extra oral method.

KEY WORDS: Mandibular nerve anesthesia; Inferior alveolar nerve; Nerve block techniques.

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INTRODUCTION

Neural blockade anesthesia is necessary for anesthetizing of much of the mandible bone as well as lower posterior teeth, which cannot be readily anaesthetized via supra periosteal deposition of local anesthetic.¹ Although there is considerable anatomical variation, portions of the mandible consist of dense, thickened bone, making it difficult for externally deposited local anesthetic to diffuse toward the inferior alveolar nerve (IAN) that lies within the substance of the mandible. Considering that the peripheral extension of the mandible nerve, after it leaves the cranial base, is not encased in bone for some distance, there are opportunities to administer blockade anesthesia at multiple levels. Hence, clinicians commonly attempt to anaesthetize this nerve, which supplies all mandible teeth on the ipsilateral side, before it enters the mandible canal via blockade anesthesia. Many techniques for mandible blockade anesthesia are practiced, the direct inferior alveolar nerve block (IANB)², the indirect IANB³, the Akinosi closed mouth technique⁴, the Gow-Gates technique⁵, extra oral techniques via the mandible notch, which are useful in some trauma patients and variations there of are most commonly used internationally. Predictable anesthesia is an essential requirement for both the patient and the dentist in Dentistry. The patient's opinion about his dental treatment is closely related to the local anesthesia experiences he has had. The proper use of local anesthesia techniques and pain management are indispensable for successful dental treatment.⁶ A thorough knowledge of anatomy is crucial in providing predictable, safe, and effective mandible anesthesia. The mandible nerve is the largest branch of the trigeminal nerve's three main branches which separate at the trigeminal ganglion near the cavernous sinus. It passes through the foramen ovale and descends into the infratemporal region for a short distance as a single trunk before dividing into anterior and posterior branches that pass down into the pterygomandibular space. The anterior branch is mostly involved with supplying motor innervations to muscles of mastication, while the posterior branch is predominantly associated with sensory function to the tongue, lower gingiva, mandibular bone, teeth, and part of the lower lip and chin on the ipsilateral side. The main objective of mandible block anesthesia is to anaesthetize the posterior branch of the mandible nerve and its distal branches. The extra osseous course of the mandible nerve is predominantly within the pterygomandibular space which is a small fascial-lined cleft containing mostly loose areolar tissue⁷. Most mandibular block procedures involve deposition of local anesthetic solution within the pterygomandibular space via an intraoral route, namely, by piercing the buccinator muscle anteriorly. The posterior division of the mandibular nerve gives rise to three nerves as it descends: the lingual, inferior alveolar, nerve to mylohyoid and auriculotemporal nerves. Neural blockade anesthesia of the mandibular nerve may stop pain conduction for any number of these nerves depending on the level and area of the nerve anaesthetized.

METHODS AND MATERIALS

This study was conducted among dentists who are practicing in Chennai. About 70 questionnaires were distributed to 70 specialists, questionnaire contained questions related to the type of inferior alveolar nerve block technique the dentists opted for and they were asked to grade them as most commonly, commonly and rarely used. Also they were asked to provide reasons as to why the technique was preferred and reason for non preference. The study was done to evaluate which IANB method among the five was most commonly preferred among the dentists. The following anesthetic techniques are available to anesthetize mandibular or IAN, lingual and buccal nerves. Namely:

1. Direct IANB⁸
2. Gow-Gates mandibular nerve block¹⁰
3. Closed mouth block (Vazirani/Akinosi block)^{11,12}
4. Fischer 1.2.3/ indirect IANB⁹
5. Extra oral¹⁷

RESULTS

The study had a sample size of 70. Questionnaire was distributed among the 70 individuals. Out of the total, direct technique was most commonly preferred by 48% of dentists, indirect technique was followed with 41.4%, Gowgates was preferred by 2.8%, Vazirani & Akinosi was preferred by 1.4%. The least preferred injection technique was the extra oral method (table 1) (figure 1). The dental practioners were asked as to why they had preferred certain techniques. The results for that were, few preferred direct as it was easy to handle with better patient comfort and high safety and better effect of injection(table 2) (figure 2). Also dentists were asked for there non preference of other techniques to which they felt that Gowgates, vazirani and extra oral were highly technique sensitive and are complicated. Many dental practioners reported that they were not familiar with the three techniques as they did not use regularly (table 3) (figure 3).

DISCUSSION

As previously mentioned, local anesthesia is fundamental in dental treatment and is widely used in several dental specialties. In 1884, William S. Halsted and Richard J. Hall first achieved neuroregional anesthesia in the mandible by an injecting a solution of cocaine in the vicinity of the mandibular foramen¹³. As a result of the difficulties and failures observed in achieving IANB, various methods of anesthesia have been suggested. The conventional IANB is the most commonly used nerve block technique for achieving local anesthesia for mandibular surgical procedures. Unfortunately, this block has a comparatively high failure rate (15% to 20%). Some authors have estimated the failure rate of this conventional IANB to be approximately 20% to 25%.¹⁴ Malamed further reported when the Gow-Gates technique is administered by inexperienced dental surgeons, it can produce more number of failures and complications than conventional techniques.¹⁵ It is technically more difficult than the conventional and closed mouth technique. Closed-mouth block (Vazirani/Akinosi block) technique is most

useful when the patient cannot open the mouth completely; as is the case with trismus. According to the Malamed Closed-mouth block technique has a more failure rate than conventional IANB. ¹⁶This technique is

not used due to its higher rate of failures and technique difficulty. Thus, most dental professionals do not utilize the Gow-Gates and Akinosi techniques.

Table 1
Preference of Injection Technique

INJECTION TECHNIQUE	MOST COMMON	COMMONLY	RARELY	P VALUE
DIRECT	34(48%)	10(14.2%)	26(37.1%)	26.32
INDIRECT	29(41.4%)	4(5.7%)	37(52.8%)	33.04
GOW GATES	2(2.8%)	8(11.4%)	60(85.7%)	45.2
VAZI RANI AKINOSI	1(1.4%)	4(5.7%)	65(92.8%)	48.4
EXTRA ORAL	0	0	70(100%)	51.6
MEAN =	0.18	0.07	0.73	

Table 1
Reason for Preference

METHOD	EASE OF USE	PATIENT COMFORT	SAFETY	HIGH SUCCESS RATE
DIRECT	34(48.5%)	7(10%)	6(8.5%)	7(10%)
INDIRECT	24(34.2%)	24(34.2%)	6(8.5%)	6(8.5%)
GOW GATE	7(10%)	3(4.2%)	0	1(1.4%)
VAZI RANI AKINOSI	0	0	0	0
EXTRA ORAL	0	0	0	0

Table 2
Reason for Non Preference

METHOD	TRISMUS	TECHNIQUE SENSITIVE	NOT FAMILIAR	COMPLICATIONS
DIRECT	0	0	16(22.8%)	0
INDIRECT	0	0	10(14.2%)	0
GOW GATE	1(1.4%)	0	58(82.8%)	0
VAZI RANI AKINOSI	9(12.8%)	9(12.8%)	45(64.2%)	7(10%)
EXTRA ORAL	2(2.8%)	9(12.8%)	48(68.5%)	11(15.7%)

CONCLUSION

Direct IANB method was most commonly preferred followed by indirect technique, GowGate method, Vazirani Akinosi method and the most little preferred technique was found to be extra oral technique. Practitioners feel direct and indirect technique is easy to administer with better patient comfort and safety application. Whereas on the other hand Gowgates,

Vazirani and Extra oral techniques produced complications and many were unfamiliar with its administration. By analyzing the anatomical variations of the accessory mylohyoid nerve, lingual nerve, presence of retro molar foramen and inferior alveolar nerve, the failure in the anesthesia of the inferior alveolar nerve should be solved by using the appropriate supplementary anesthetic techniques described in the literature.

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