



Efficacy of Extra-Oral Inferior Alveolar Nerve Block in Mandibular Teeth Extraction

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Authors' contributions

This work was carried out in collaboration among all authors. Authors AR and MS designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors AG and BA managed the analyses of the study. Authors AAK and BA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To determine the effectiveness of Extra oral inferior alveolar nerve block (IANB) technique in terms of pain during injection, onset of anesthesia and pain during extraction of mandibular teeth.

Methodology: This cross sectional study was carried out at the department of Oral & Maxillo-facial Surgery, Institute of Dentistry, Liaquat University of Medical & Health Sciences Jamshoro / Hyderabad, from May 2018 to November 2018. All patients in the age range of 18-45 years regardless of gender and having sub-mucous fibrosis were included. Affected teeth were diagnosed via clinical examination, intra oral periapical radiograph (IOPAR) and Orthopantomogram (OPG). Mandibular teeth were anesthetised by extra oral inferior alveolar nerve

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block. Visual analog scale was used to record severity of the pain during the injection of anesthesia and during the extraction. Onset of the anesthesia was recorded in minutes. Data was documented via self-made proforma and analyzed by SPSS 20 version 20.

Results: Overall 64 cases were studied. Out of which 34 were males and 30 were females. In most of the cases pain was not found, while 8 cases showed mild pain and 4 showed moderate pain. During extraction, there was no pain among 46 patients, while 10 had mild pain and only 8 had moderate pain.

Conclusion: It was concluded that extra oral inferior alveolar nerve block technique is the best treatment option with less pain during injection, rapid onset of anesthesia, and less pain during extraction.

Keywords: Extraction of mandibular teeth; extra oral IANB.

1. INTRODUCTION

In dental procedures, injecting the local anesthetic agents into the mucous membrane and skin is the most prevalent method to perform a pain free procedure. These minor and painful processes have an apparent advantages for both surgeon and patient in minimizing the patient's pain in course of operation [1]. At the mandibular site, an intra-oral injection method of inferior alveolar nerve block is prevalent for local anesthesia and often leads to effective pulpal anesthesia [2]. The lack of adequate bony points of reference, large variances in the ramus dimension and mandibular-foramen position are the factors for this technique's failure [3], in addition to other factors, like non-understanding of anatomical structures, patients with extreme anxiety, technical errors, infection or inflammation and impaired anesthetic solutions [4]. The use of intra oral mandibular nerve block method is prevalent and commonly used in spite of some significant drawbacks and potential risks such as numerous needle pricks in case of multiple dental procedures in a particular region, especially within the mandible. The extra-oral methods have a broad range of indications and can be superior to intra-oral strategy [5]. Extra-oral block is suggested for the acute inflammation causing conditions of jaw, mandibular fractures and cases where trismus makes intra-oral injection impossible [6,7]. When oral sepsis occurs, injection in mouth is risky, primarily because the injection of liquid under pressure impairs the tissues and makes it more susceptible to disease. All injections are discontinued for any likely sepsis with extra-oral blocks. Extra-oral inferior alveolar nerve block indications include the anesthetising of entire mandibular nerve distribution for extensive surgical procedure in which intra-oral inferior alveolar nerve block (IANB) cannot be performed, due to presence of trismus, local

infection and further conditions that make block of inferior alveolar nerve's terminal branches further problematic or impossible. However in the literature less commonly described that the extra-oral techniques having wide spectrum of indication as well as can be more advantageous than intraoral techniques [8]. The purpose of this study is to determine the effectiveness of extra-oral approach of inferior alveolar nerve block techniques in subjects undergoing the extraction of mandibular teeth. This study may help out the society as it will guide us to provide a definite treatment of block anesthesia for extraction of mandibular teeth. Above mentioned types of block anesthesia are useful, easy, safe, and having less complications to reduce the morbidity, help to improve patient's quality of life and also reduces the total cost of the treatment in patient particular and society at large.

2. METHODOLOGY

This cross sectional study was conducted at department of Oral & Maxillofacial Surgery, Institute of Dentistry at and Liaquat University of Medical & Health Sciences Jamshoro / Hyderabad. Study duration was 6 months from May 2018 to November 2018. The patients having age from 18-45 years regardless of gender, sub mucous fibrosis and willing to contribute in the study were included. All the patients with any systemic disease, immunocompromised patients, patients having any neurological disorders and un-co-operative patients were excluded. The clinical and demographic parameters such as age and gender were recorded. The affected teeth were diagnosed by history, clinical examinations, peri apical and Orthopantomogram radiographs. The mandibular teeth were anesthetised by extra oral inferior alveolar nerve block after scrubbing by palpating anterior and posterior parts of masseter muscle at lower body of mandible by marking at

the pre auricular region and posterior part of the masseter muscle. After that needle were inserted between angle and posterior part of ramus of mandible and then anesthetic solution was deposited. Visual analog scale was used to record severity of the pain from 0 (no pain) to 10(worst pain) during the injection of anesthesia and during the extraction. The onset of the anesthesia was recorded in minutes for inferior alveolar nerve block in mandibular teeth anesthesia and the data recording was carried out by a proforma. SPSS (statistical package for social services) Version-20 was used for data analysis.

3. RESULTS

Total 64 patients were studied and their mean age was (34.21+13.65 years). Out of all 64 patients 34 were males and 30 were females. Table 1.

On the pain assessment at injection time, the majority of the cases were without pain, while 8 cases showed mild pain and 4 had moderate pain. While, no severe pain was found among both groups. Duration of onset of anesthesia was less, as most of the cases had duration of onset of anesthesia at 3 minutes, followed by 4 at 5 minutes and 3 at 6 minutes. On pain assessment during extraction, there was no pain among 46 cases, 10 cases showed mild pain and 8 had moderate pain, while no severe pain was documented. Table 2.

There was no significant impact of gender on pain during extraction, p-value 0.359. Table 3.

DISCUSSION

This study has been conducted to observe the best treatment option for teeth extraction, according to our knowledge this is observed that the extra oral inferior alveolar nerve block technique is best treatment option with less pain during injection, rapid onset of anesthesia, and less pain during extraction. Other old published studies stated that the traditional Halstead technique is the most frequently used technique for inferior alveolar nerve anesthesia in the United States, [9] a direct method with an intraoral access to the inferior alveolar nerve just before penetrating the mandibular channel. This block technique has 71 to 87 percent of success rates [10] and partial anesthesia is not rare. In addition, the indirect method has been exhibited to be ineffective among 15% of cases [11]. Abbott SM et al [12]. reported that Extra-oral Mandibular Nerve Block has several benefits like patient cooperation is not necessarily needed: The injection pathway is also closer to the nerve and can provide higher interaction between the nerve trunk and the local anesthetic solution. In another previous study of Waikakul A et al [13]. found comparable findings. In the literature it is stated that combination of extra-oral and intra-oral benchmarks are implicated for the technique of Gow-Gates mandibular block. Firstly, the maxillary second molar's mesio-palatal cusp determines the injection's height [14]. The



Fig 1. Extra oral inferior alveolar nerve block

Table 1. Mean age of the patients n=64

Variables	Statistics
Age	
Mean±SD	34.21+13.65 years
Minimum	18
Maximum	45
Gender	
Male	34(53.1%)
Female	30(46.9%)
Total	64(100.0%)

Table 2. Pain assessment and onset anesthesia among patients n=64

Variables	Frequency	Percentage
Pain assessment on injection time		
No pain	52	81.2%
Mild pain	8	12.5%
Moderate pain	4	6.2%
Severe	00	0.0%
Onset of anesthesia duration		
3 minutes	50	78.1%
5 minutes	08	12.5%
6 minutes	06	9.4%
Pain during extraction		
No pain	46	71.9%
Mild pain	10	15.6%
Moderate pain	08	12.5%
Severe	00	0.0%

Table 3. Pain assessment during extraction according to gender n=64

Pain	Gender		Total	p-value
	Male	Female		
No pain	27	19	46	0.359
Mild pain	4	6	10	
Moderate pain	3	5	8	
Severe	34	30	64	
Total	27	19	46	

concurrent visualization of extra-oral structures are needed when the mandibular block method of Gow-Gates is administered is problematic and is frequently listed by doctors as a justification for the further mandibular block methods being preferred [15]. However, clinical practice with the method is regarded to tackle with early problems that may arise when the method is first applied. Furthermore, due to the greater distance between the mandibular nerve and the sites of local anesthetic deposition (~5–10 mm), and the bigger size of the nerve trunk at a comparatively higher level, the time needed for the anesthesia onset is greater than the direct IANB [14]. However, the level of given injection has the benefit for anesthetising further terminal regions of the mandibular nerve contrasted to the

methods of the lower-level block, decreasing the necessity for extra-oral injections for initial block. Our first approach suggested that larger sample size and multicenter studies should be done to confirm the best technical option in the favour of our population. Because this study declared that extra oral technique had very lower rate of complication and almost pain free technique with duration of onset of anesthesia almost at 3 minutes.

4. CONCLUSION

It was concluded that that extra oral inferior alveolar nerve block technique is the best treatment with less pain during injection, rapid onset of anesthesia, and less pain during

extraction. More studies are required on this comparison.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s). Well-versed and printed consent was taken from patient.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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