

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

ALI RAZA¹, MUHAMMAD SHAHZAD², AMEER GUL³, ABDUL GHANI⁴, NOORULLAH JAGIRANI⁵, AFTAB AHMED KUMBHAR⁶

¹Oral maxillofacial surgery Department of LUMHS

²Associate Professor, Oral maxillofacial surgery Department of LUMHS

³Oral maxillofacial surgery Department of LUMHS

⁴Lecturer, Dental Material LUMHS

⁵Resident, Department of Operative Dentistry of LUMHS

⁶Resident, Oral maxillofacial surgery Department of LUMHS

Correspondence to: Dr. Ali Raza Abbasi, Email: dralirazaabbasi02@yahoo.com, Contact: +923362704904

ABSTRACT

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

Design: This was a cross sectional study

Setting: Oral and Maxillofacial Surgery department, dentistry Institute of Liaquat University of medical and health Sciences Jamshoro.

Duration: Six months from May 2018 to November 2018

Methods: All patients having age from 18-45 years irrespective of gender, having sub mucous fibrosis and willing to participate in this study were included. Patient's teeth were anesthetized by intra oral inferior alveolar nerve block. Visual analog scale was used to assess the severity of pain during the injection of anesthesia and during the extraction. Data was recorded via self-made proforma.

RESULTS: Total 64 patients were studied, 34 were males and 30 were females. On the pain assessment at injection time almost all cases were without pain and only 2 cases showed mild pain. Pain was significantly decreased among all patients.

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

Key words: Extraction of mandibular teeth, intra oral IANB,

INTRODUCTION

The injecting local anesthetic agents into mucous membrane and the skin are one of the commonest small, painful part of a dental technique and patient can possibly be informed that the injection will feel like a pinch and to minimize the discomfort of patient during the procedure has obvious benefits for both the patient and the surgeon.¹ IANB is the commonest injection technique for local anesthesia in the mandibular region and does not always lead to efficacious pulpal anesthesia.² Absence of appropriate bony landmarks and big differences in dimension of the ramus and position of the mandibular foramen are the reasons for failure of this technique.³ Other factors, like inadequate knowledge regarding anatomical structures, extremely anxious patients, infection or inflammation, technical errors and the damaged anesthetic solutions.⁴ Use of intra-oral methods of mandibular nerve (V3) block are frequent and are extensively used, although there are some inherent drawbacks and potential complications for example needle pricks more than one for several extractions in single quadrant mainly in the mandible. Recently, in one study done on children, the authors have reported that, the two-stage technique is a practical alternative to conventional injections in reducing pain for all intra oral injection techniques including the IANB in children.⁵ To relieve the pain upon injection, the application of local anesthesia, sharp narrow needles, low-pressure injection, a slow rate of injection, and buffered and warmed solutions have been recommended in the literature.^{6,7} Out of these available options, though the topical anesthesia is widely used, its efficacy in decreasing the pain linked to intra-oral injection of the local anesthesia is the questionable.⁷⁻⁹ Therefore this study aims to determine the efficacy of intra-oral approach of IAN block techniques among patients underwent mandibular teeth extraction.

MATERIAL AND METHOD

Study Design: Cross sectional study

Settings: Department of Oral & Maxillofacial Surgery, Institute of Dentistry, Liaquat University of Medical & Health Sciences (LUMHS) Jamshoro.

Study duration: Six month from May 2018 to November 2018

Study sampling: Non probability consecutive sampling

Inclusion criteria: All the patient having age from 18-45 years irrespective of gender, having sub mucous fibrosis, willing to participate in this study and maxillofacial trauma patients were included.

Exclusion criteria: All the patient having any systemic disease, immunocompromised patients, patients having any Neurological disorders and un-cooperative patients were excluded.

Methods: present study was conducted after taking ethical approval from ethical review committee of LUMHS Jamshoro. After taking informed consent the demographic and clinical parameters like age and gender were recorded. Informed and written consent was taken from patient. The affected teeth were diagnosed by History, Clinical examination, peri-apical and Orthopantomogram radiographs. The mandibular teeth were anesthetized by intra oral inferior alveolar nerve block. For the anesthesia thumb was placed over retro-molar area and external oblique ridge were felled at depression area. The insertion point of needle was 6-8mm above the mid-point of thumb and 2mm posterior to internal oblique ridge. The syringe barrel was positioned at the area of lower 2nd pre-molar teeth in contralateral side. The depth of penetration was 20-25mm at which point bone was touched. Aspiration was performed to confirm the tip of needle is not located intra-vascularly and anesthesia was delivered. Severity of pain was documented by using visual analog scale with ratings 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 extraction. All the data was recorded in the proforma. All data was analyzed by statistical software SPSS-20.

RESULTS

Total 64 patients were enrolled; mean age was 30.09±9.86 years, Most common age group was 31-40 years 34.4%, followed by 20-30 years 31.2%, 41-50 years 26.6% and >50 years old were only 7.8%. 38 were males and 26 were females. Table: No. 1.

On the pain assessment at injection almost 6 patients had no pain, 48 had mild pain 10 had moderate pain, while no any was found with severe pain. Duration of onset of anesthesia 6 minutes in 10 cases 5 minutes in 46 cases and 6 minutes in 8 cases. Table: No. 2.

On the pain assessment at during extraction almost cases were without pain 6 patients had no pain, 46 had mild pain 3 had moderate pain, while no any was found with severe pain. Table: No. 2.

Table 1: Mean age of the patients n=64

Variables	Frequency(%)
Age groups	
20-30 years	20(31.2%)
31-40 years	22(34.4%)
41-50 years	17(26.6%)
>50 years	05(7.8%)
Total	64(100.0%)
Gender	
Male	38(59.4%)
Female	26(40.0%)
Total	64(100.0%)

Table 2: Pain assessment on injection time among patients n=64

Variables	Frequency(%)
Pain during injection	
No pain	06(9.4%)
Mild pain	48(75.0%)
Moderate pain	10(15.6%)
severe	00
Total	64(100.0%)
Onset of anesthesia	
3-5 minutes	14(21.9%)
>5 minutes	50(78.1%)
Total	64(100.0%)
Pain during extraction	
No pain	46(71.9%)
Mild pain	23(23.4%)
Moderate pain	03(4.7%)
Severe	00
Total	64(100.0%)



Fig: Intra oral inferior alveolar nerve block

DISCUSSION

This study has been conducted to observe the best treatment option for teeth extraction intra oral IAN block technique has been used. In other old published studies stated that the most widely used procedure for IAN anaesthesia in the United States is a conventional method of Halstead, which is a direct approach where in intra-oral route is used for the IAN access, before IAN's penetration into mandibular canal.⁵ This block procedure has rates of success between 71% and 87%, and it is not rare for incomplete anaesthesia.⁶ It has also been reported that in 15 percent of cases, the indirect method is unsuccessful.⁷ Some studies reported that the intra-oral method has been utilized for IAN desensitization.⁸⁻¹¹ Clinicians utilized the many intra-oral landmarks during the administering direct inferior alveolar nerve block.¹² In another pilot animal study of Goudie-DeAngelis EM et al¹³ reported that Compared to the extra-oral method, the intra-oral approach demonstrated superior reliability with low dose injection in cadaver dogs having normal anatomy. In another old study Waikakul A et al.¹⁴ reported comparable findings. In the literature mostly studies found intra-oral technique is the best and this difference can possibly because anatomical variation and other musculo-skeletal variation.

In the literature it is stated that For the Gow-Gates technique that involves mandibular block, intra-oral milestones have been utilized. First of all, the injection height is defined through the mesiopalatal cusp of second

maxillary molar.¹⁴ When delivering the mandibular block of Gow-Gates, simultaneous intra-oral visual representation can be challenging and is frequently considered by clinicians as an explanation why they favor other procedures of mandibular block.¹⁵ Though, clinical expertise with the approach is deemed to resolve early challenges that can probably be encountered whenever the procedure is initially applied.¹⁶ Moreover, the time taken for the initiation of anaesthesia is longer as compared to direct IANB, because of the longer distance between the V3 (5-10 mm) and the site of local anaesthesia deposition, and also the bigger size of the nerve trunk at this comparatively greater level.¹⁶ Though the level of injection administration has the benefit of anaesthetizing further V3 linked terminal branches as compared to lower-level block procedures, eliminating the need to replace the initial block with additional injections. Our first approach is suggested that more frequent studies should be done to confirm the best technical option in the favor of our population. IANB is the commonest technique using dentistry field and several modifications of conventional nerve block are described in literature recently.¹⁷ Best technique selection depends on several factors like successful rates and complications linked to the technique selected. Dentists or surgeons should be awarded regarding present current modification of IANB techniques in terms of effectively choose b/w the modifications.¹⁷ certain operators might face difficulties in the identifying the anatomical landmark, those useful in the application in the IANB and depends on conventions as to where needles should be positioned. These assumptions may lead to failure of IANB and IANB failure rate has been estimated 20-25% which is considerably higher.¹⁷

CONCLUSION

It was concluded that that intra oral IAN block technique is the best treatment with less pain during injection, rapid onset of anesthesia, and lesser pain during extraction of mandibular teeth.

Limitations: This was a small sample size and single center study

Suggestions/ recommendations: Further large sample size multicenter studies should be done

Conflict of Interest: There is no conflict of interest

REFERENCES

- Kashyap MV, Desai R, Reddy BP, et al. Effect of alkalinisation of lignocaine for intra oral nerve block on pain during injection, and speed of onset of anaesthesia. *Br J Oral Maxillofac Surg* 2011;49:72-75.
- Haghighat A, Jafari Z, Hashemina D, Samandari MH, et al. Comparison of success rate and onset time of two different anesthesia techniques. *Med Oral Patol Oral Cir Bucal* 2015;20(4):459-463
- Ardakani FE, Bahrololoumi Z, Booshehri MZ, Azam AN, Ayatollahi F. The position of lingula as an index for inferior alveolar nerve block injection in 7-11-year-old children. *J Dent Res Dent Clin Dent Prospects* 2010;4(2):47-51.
- Palti DG, deAlmedia CM, Andreo JC, et al. Anesthetic technique for inferior alveolar nerve block: a new approach. *J Appl Oral Sci* 2011;19(1):11-15
- Sandeep V, Kumar M, Jyostna P, Duggi V. Evaluation of 2-stage injection technique in children. *Anesthesia progress*. 2016 Mar;63(1):3-7.
- Rao A, Thakkar D, Rao A, Karuna Y M, Srikant N. Evaluation of a modified two-stage inferior alveolar nerve block technique: A preliminary investigation. *Dent Hypotheses* 2017;8:34-8
- Kincheloe JE, Mealiea WL, Mattison GD, Seib K. Psychophysical measurement on pain perception after administration of a topical anesthetic. *Quintessence Int* 1991;22:311-5
- Hutchins HS, Young FA, Lackland DT, Fishburne CP. The effectiveness of topical anesthesia and vibration in alleviating the pain of oral injections. *Anesth Prog* 1997;44:87-9
- Henry T, Pusterla N, Guedes AG, Verstraete FJ. Evaluation and clinical use of an intra-oral inferior alveolar nerve block in the horse. *Equine Vet J*. 2014; 46: 706-710.
- Yagiela JA. Anesthesia and pain management. *Emerg Med Clin N Am*. 2000; 18: 449-470.
- Nazih MA, El-Sherif MW. Presentation of an intra-oral approach for mandibular alveolar nerve block in cattle: cadaveric study. *MOJ Anat & Physiol*. 2018;5(2):64-7.
- Khoury J, Townsend G. Neural blockade anaesthesia of the mandibular nerve and its terminal branches: rationale for different anaesthetic techniques including their advantages and disadvantages. *Anesthesiology Research and Practice*. 2011 Jan 1;2011.
- Goudie-DeAngelis EM, Snyder CJ, Raffae MR, David FH. A Pilot Study Comparing the Accuracy of Two Approaches to the Inferior Alveolar Nerve Block in Canine Cadavers. *International Journal of Applied Research in Veterinary Medicine*. 2016;14(1).
- Waikakul A, Punwutikorn J. A comparative study of the extra-intra-oral landmark technique and the direct technique for inferior alveolar nerve block. *J Oral Maxillofac Surg*. 1991;49(8): 804-8;
- Malamed SF. *Malamed, Handbook of Local Anesthesia*, Mosby, St. Louis, Mo, USA, 5th edition, 2004.
- Johnson TM, Badovinac R, Shaefer J. Teaching alternatives to the standard inferior alveolar nerve block in dental education: outcomes in clinical practice. *Journal of dental education*. 2007 Sep 1;71(9):1145-52
- Khalil H. A basic review on the inferior alveolar nerve block techniques. *Anesthesia, essays and researches*. 2014 Jan;8(1):3.