International Journal of Oral Health Dentistry 2022;8(4):284–287

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

International Journal of Oral Health Dentistry

Journal homepage: www.ijohd.org

Original Research Article

A survey to evaluate and compare patients perception to pain, pressure and discomfort induced by types of injection techniques used for mandibular anaesthesia

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ARTICLE INFO

Article history:
Received 25-11-2022
Accepted 28 -11-2022
Available online 19-12-2022

Keywords:
Inferior alveolar nerve block
Mental nerve block
Local infiltration
Local anaesthesia
Injection pain

ABSTRACT

Local anaesthesia makes the patient and the dentist comfortable to do treatment with least amount of discomfort, but dental patient's most frequent fear is of receiving local anaesthetic injections. The present study attempted to evaluate and compare patient's perception to pain, pressure and discomfort induced by three types of injections (Infiltration, mental nerve block and inferior alveolar nerve block injection) for mandibular anaesthesia. Patients were asked to grade pain, pressure and discomfort associated with injection insertion on visual analog scale. Inferior alveolar nerve block was graded the most painful nerve block, while Infiltration was graded as the least painful. Patient's perception to pressure and discomfort was highest for inferior alveolar nerve block and lowest to mental nerve block.

1. Introduction

In dentistry, local anaesthetic not only makes the patient more comfortable but also makes the dentist more comfortable so that the planned operations can be completed with the least amount of discomfort. It is evident from clinical practise and academic research that dental local anaesthetic does not always work as well as hoped. Even in the absence of a tooth with acute pulpits, some patients may find it challenging to achieve mandibular block anaesthesia.[1] One of the most frequent fears mentioned by dental patients is a fear of receiving local anaesthetic injections.[2] Given that the delivery of local anaesthesia via injection is the fundamental element of pain relief techniques in dentistry (Malamed, 2009); needle phobia in particular is a significant problem. Patients and dentists frequently avoid difficult injections as a result, which has a negative impact on pain management.[3] Patients experience pain during both initial needle insertion and subsequent needle penetration. Additionally, block (i.e., the deposition of anaesthetic solutions) can significantly increase patients' feelings of pressure and discomfort.[4] This study attempted to evaluate and compare patient's perception to pain, pressure and discomfort induced by three types of injections (infiltration, mental nerve block and inferior alveolar nerve block injection) for mandibular anaesthesia.

2. Materials and Methods

The study included 151 patients, who required mandibular blocks (Local infiltration, mental nerve block and inferior alveolar nerve block injection) before treatment were included in the study. Before entry into the study, written informed consent was taken from each subject. Patients'

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https://doi.org/10.18231/j.ijohd.2022.054

were informed of the study's purpose and ethical clearance was taken. Three injection techniques (Local infiltration, mental nerve block and inferior alveolar nerve block injection) were selected to evaluate and compare the patient's perception to pain, pressure and discomfort during injection. These 151 patients were divided into three groups. Group 1 included 63 patients and were given local infiltration injection, Group 2 included other 63 patients and was given inferior alveolar nerve block and Group 3 included other 25 patients and was given mental nerve block. 151 patients who are classified as ASA I and ASA II by the American Society of Anesthesiologists (ASA), and who are 18 years old or above 18 years are included in the study. Patients taking anti-inflammatory drugs; patients who abused drugs or alcohol; patients with a history of personality disorders; ASA III as classified by the American Society of Anesthesiologists; patients who did not demonstrate subjective signs of anesthesia or required a second injection, Necrotic teeth were not included in the study.[5] A topical anaesthetic spray (Lidocaine 15%w/w, Lidocaine topical Aerosol USP, LIDAYN) was used on the buccal mucosa before injection. Then, Local Anaesthesia (2%w/w Lignocaine plus adrenaline bitartrate eq. to Adrenaline 0.001%w/w) was administered by dentist after one minute as per the injection procedure described in The Handbook of Local Anesthesia.[6] 'Plastic Slip-tip Mr Inject disposable syringe, size 5 ml' were used. The injections were given by the same one dentist in all the patients.

The patients were explained and asked to complete a paper visual analogue scale (VAS) questionnaire, which reported their subjective response to the injection technique after getting the injection. On a 100-mm VAS, 0 to 4mm represented No Pain, Pressure or discomfort, 5 to 44 mm represented Mild pain, pressure or discomfort, 45 to 74 mm represented Moderate pain, pressure or discomfort, 75 to 100 mm represented, Severe pain, pressure or discomfort.[7,8]

3. Results

Total of 151 patients participated in the study, out of which 77 were male and 74 were female patients. The age ranges of the patients were from 19 to 89 years.

Below is the Table 1 given for the distribution of mandibular teeth tested according to the injection technique used.

The findings for VAS pain value comparison between infiltration technique, mental nerve block technique and inferior alveolar nerve block technique Table 2 shows that 31.7% of the people felt SEVERE pain during inferior alveolar nerve block, while only 3% and 12% people felt severe pain during local infiltration and mental nerve block technique respectively.

Table 3 shows that 25% of the people felt severe pressure duringinferior alveolr nerve block, while only 11% and 4% people felt severe pressure during local infiltration and mental nerve block technique respectively.

Table 1: Distribution of mandibular teeth tested according to the injection technique used

Injection Technique	Incisor	Canine	Premolars	Molars
Infiltration	15	24	16	8
Inferior alveolar nerve block	12	10	20	21
Mental nerve block	5	9	11	0

Table 4 shows that 15.8% of the people felt severe discomfort during inferior alveolr nerve block, while only 4.7% and 4% people felt severe discomfort during local infiltration and mental nerve block technique respectively.

4. Discussion

The presents study results showed that the Inferior alveolar nerve block was more painful than the mental nerve block and the mental nerve block was more painful than the infiltration. The patient's perception to pressure and discomfort induced by Inferior Alveolar nerve block was more as compared to the infiltration and mental nerve block. However, there is slight difference in values between the infiltration and mental nerve block. A survey conducted by Kaufman E, Epstein JB, Naveh E, Gorsky M, Gross A, Cohen G also founded that the inferior alveolar nerve block was most painful and produced more discomfort among the 4 traditional nerve blocks (infiltration, mental nerve block, inferior alveolar nerve block, and periodontal ligament [PDL] injection).[5] A retrospective analysis done by McCartney M, Reader A, Beck M concluded that with the IAN block, moderate-to-severe pain may happen anywhere between 57% and 89% of the time.[9] In present study, 60% of the people felt moderate pain while, 31.7% of the people felt severe pain, which is more painful as compared to the local infiltration and mental nerve block. An alternative method could be considered to reduce or eliminate the painful experience and discomfort induced by the inferior alveolar nerve block to make the patients comfortable during the dental treatment. Topical anesthesia, low-pressure injection, small, sharp needles, a slow injection pace, and warm, buffered solutions have all been recommended to reduce pain during injection. A study conducted by Yesilyurt, C., Bulut, G. & Taşdemir, T showed that using the Wand technique, the IAN block injections were substantially less painful.[10] Contrary to popular belief, pain is not primarily brought on by needle penetration of tissue. Greater distress and/or pain are brought on by the volume and pressure of the local anaesthetic being administered. The dentist may become anxious when administering local anesthetic injections, in addition to the

Table 2: VAS pain value comparison between infiltration technique, mental nerve block and inferior alveolar nerve block injection technique

	Local infiltration	Inferior alveolar nerve block	Mental nerve block
Number of patients who felt No Pain (0-4mm)	26	1	10
Number of patients who felt mild pain (5-44mm)	25	4	8
Number of patients who felt Moderate Pain (45-74 mm)	10	38	4
Number of patients who felt Sever Pain (75-100mm)	2	20	3

Table 3: VAS pressure value comparison between infiltration technique, mental nerve block and inferior alveolar nerve block injection technique

	Local infiltration	Inferior alveolar nerve block	Mental nerve block
Number of patients who felt No Pressure (0-4mm)	19	6	19
Number of patients who felt Mild Pressure (5-44mm)	27	13	4
Number of patients who felt Moderate Pressure (45-74 mm)	10	28	1
Number of patients who felt Sever Pressure (75-100mm)	7	16	1

Table 4: VAS needle insertion discomfort value comparison between infiltration technique, mental nerve block and inferior alveolar nerve block injection technique

	Local infiltration	Inferior alveolar nerve block	Mental nerve block
Number of patients who felt No Discomfort (0-4mm)	32	6	15
Number of patients who felt Mild Discomfort (5-44mm)	18	9	8
Number of patients who felt Moderate Discomfort (45-74 mm)	10	38	1
Number of patients who felt Sever Discomfort (75-100mm)	3	10	1

patient. Despite this, the most popular technique in dentistry for relieving pain is still injecting local anesthetic. There are, however, a number of strategies to reduce discomfort prior to dental operations, as well as the frequently uncomfortable local anesthetic injection itself. In addition to computerized local anesthetic (the Wand), newly developed techniques to lessen dental patients' discomfort and anxiety include transcutaneous electrical nerve stimulation (TENS), intraoral lidocaine patch usage, and computerized local anesthesia.[11] Utilizing the CCLAD compared to earlier studies of the IANB using a traditional syringe resulted in less pain during solution deposition.[12]

5. Conclusion

This study evaluated and compared patient's perception to pain, pressure and discomfort induced by three types of injections (Infiltration, mental nerve block and inferior alveolar nerve block injection) for Mandibular Anaesthesia. Inferior alveolar nerve block was graded the most painful nerve block, while Infiltration was graded as the least painful. Patient's perception to pressure and discomfort was highest for inferior alveolar nerve block and lowest to mental nerve block. Alternative methods (computerized local anesthetic, intraoral lidocaine patch usage etc.) could be used to reduce patient's perception to pain, pressure and discomfort and hence further research is needed.

6. Source of Funding

None.

7. Conflict of Interest

None.

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Cite this article: Kaur H, Kaur R, Deepika. A survey to evaluate and compare patients perception to pain, pressure and discomfort induced by types of injection techniques used for mandibular anaesthesia. *Int J Oral Health Dent* 2022;8(4):284-287.