

ORIGINAL RESEARCH

ASSESSMENT OF SUCCESS RATE AND ONSET TIME OF TWO DIFFERENT MANDIBULAR ANAESTHESIA TECHNIQUES: A COMPARATIVE STUDY

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ABSTRACT:

Background: The inferior alveolar nerve block is the most common injection technique used in dentistry and many modifications of the conventional nerve block have been recently described in the literature. Hence; we planned the present study to compare the success rate of inferior alveolar nerve block (IANB) technique and Gow-Gates (GG) Technique for Mandibular Block in patients undergoing mandibular third molar surgical extraction. **Materials & methods:** The present study included assessment of efficacy of two different mandibular anaesthesia techniques in patients undergoing dental surgical procedure. A total of 60 subjects were included in the present study, out of which 32 were males and 28 were females. Two sets of tests, an electric pulp test (EPT) for evaluating pulpal anesthesia and a sharp explorer test (SET) for evaluating gingival anesthesia, were performed prior to either injection. All the patients were broadly divided into two study groups. Group 1 included subjects in which GG mandibular anaesthesia technique was used, and Group 2 in which IANB technique was used. The rating scale was recorded as A for good, B for fair, and C for poor effect. All the results were compiled and analysed by SPSS software. **Results:** While comparing pain on injection, it was seen that 18 and 17 patients in group 1 and group 2 had no pain on injection respectively. It was observed that similar percentage of patients in both the groups had 'A' score of satisfaction. Non-significant results were obtained while comparing the success rate in subjects of both the study groups. **Conclusion:** In terms of success, both the techniques are equally effective.

Key words: Anesthesia, Gow-gates, Technique

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INTRODUCTION

The inferior alveolar nerve block is the most common injection technique used in dentistry and many modifications of the conventional nerve block have been recently described in the literature.^{1, 2} Selecting the best technique by the dentist or surgeon depends on many factors including the success rate and complications related to the selected technique. Dentists should be aware of the available current modifications of the inferior alveolar nerve block techniques in order to effectively choose between these modifications.^{3- 5} Some operators may encounter difficulty in identifying the anatomical landmarks which are useful in applying the inferior alveolar nerve block and rely instead on assumptions as to where the needle should be positioned. Such assumptions can lead to failure and the failure rate of inferior alveolar nerve block has been reported to be 20-25% which is considered very high.^{6- 9} Hence; we planned the present study to compare the success rate of inferior alveolar nerve block (IANB) technique and

Gow-Gates (GG) Technique for Mandibular Block in patients undergoing mandibular third molar surgical extraction.

MATERIALS & METHODS

The present study was conducted in the department of oral surgery of the dental institute and included assessment of efficacy of two different mandibular anaesthesia techniques in patients undergoing dental surgical procedure. Ethical approval was taken from institute's ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 60 subjects were included in the present study, out of which 32 were males and 28 were females. Inclusion criteria for the present study included; Patients planned to undergo mandibular third molar surgical removal, Patients with negative history of any systemic illness, Patients without any known drug allergy, Patients who hadn't underwent any oral surgical procedure in the past.

Two sets of tests, an electric pulp test (EPT) for evaluating pulpal anesthesia and a sharp explorer test (SET) for evaluating gingival anesthesia, were performed prior to either injection. All the patients were broadly divided into two study groups. Group 1 included subjects in which GG mandibular anaesthesia technique was used, and Group 2 in which IANB technique was used. Skilled surgeons performed the anaesthetic procedure and the dental extraction procedure in patients of both the study groups. After completion of surgery, a questionnaire concerning satisfaction with the effect of the block anesthesia was given to patients. The rating scale was recorded as A for good, B for fair, and C for poor effect. The time of onset and total dosage used for anesthesia were also recorded for use in the study analysis. All the results were compiled and analysed by SPSS software. Chi-square test and one way ANOVA were used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

RESULTS

Anaesthetic effect of patients receiving different type of block techniques is shown in **Table 1**. While comparing pain on injection, it was seen that 18 and 17 patients in group 1 and group 2 had no pain on injection respectively. It was observed that similar percentage of patients in both the groups had ‘A’ score of satisfaction.

Table 1: Anaesthetic effect of patients receiving different type of block techniques

Parameter		Group 1 (N)	Group 2 (N)	p-value
Pain on injection	None	18	17	0.09
	Mild	12	13	
	Sever	0	0	
Patients satisfaction	A	17	16	0.10
	B	13	14	
	C	0	0	

Non-significant results were obtained while comparing the patient’s satisfaction and pain on injection in between the two study groups (**P-value > 0.05**). Non-significant results were obtained while comparing the success rate in subjects of both the study groups (**Table 2**).

Table 2: Success rate of anesthesia techniques in the subjects of the two study groups as evaluated by Sharp explorer test

Group	Success rate (%)			p-value
	0 min	10 min	60 min	
Group 1	0	90	95	0.82
Group 2	0	95	100	

DISCUSSION

In the present study, we observed non-significant difference while comparing the mean success rate in patients of both the study groups. Aggarwal V et al evaluated and compared three alternative techniques of providing anesthesia to mandibular molars were evaluated and compared with

conventional IANB. Ninety-seven adult volunteer subjects, actively experiencing pain, participated in this prospective, randomized, double-blinded study. Twenty-five patients received Gow-Gates mandibular conduction block anesthesia, 24 patients received "high" Vazirani-Akinosi inferior alveolar nerve block, 26 received only buccal-plus-lingual infiltrations, and 22 patients (control) received conventional IANB anesthesia. Endodontic access preparation was initiated after 15 minutes of anesthesia. Pain during treatment was recorded using a Heft-Parker visual analog scale. Success was recorded for "none" or "mild" pain. Statistical analysis using nonparametric McNemer tests showed that Gow-Gates gave a success rate of 52%, which was statistically higher than control IANB (36%) ($P < 0.05$). Vazirani-Akinosi and infiltrations gave 41% and 27% success rates, respectively, with no statistically significant differences from control IANB. Gow-Gates mandibular conduction anesthesia may increase the success rates in patients with irreversible pulpitis compared with conventional IANB. None of the techniques provided acceptable success rates.¹⁰

Foster W et al randomly administered, in a single-blind manner, 3 sets of injections: an inferior alveolar nerve block (IANB) plus a mock buccal and a mock lingual infiltration of the mandibular first molar, an IANB plus a buccal infiltration and a mock lingual infiltration of the mandibular first molar, and an IANB plus a mock buccal infiltration and a lingual infiltration of the mandibular first molar in 3 separate appointments spaced at least 1 week apart. An electric pulp tester was used to test for anesthesia of the premolars and molars in 3-minute cycles for 60 minutes. Anesthesia was considered successful when 2 consecutive 80 readings were obtained within 15 minutes following completion of the injection sets, and the 80 reading was continuously sustained for 60 minutes. For the IANB plus mock buccal infiltration and mock lingual infiltration, successful pulpal anesthesia ranged from 53 to 74% from the second molar to second premolar. For the IANB plus buccal infiltration and mock lingual infiltration, successful pulpal anesthesia ranged from 57 to 69% from the second molar to second premolar. For the IANB plus mock buccal infiltration and lingual infiltration, successful pulpal anesthesia ranged from 54 to 76% from the second molar to second premolar. There was no significant difference ($P > .05$) in anesthetic success between the IANB plus buccal or lingual infiltrations and the IANB plus mock buccal infiltration and mock lingual infiltration. They conclude that adding a buccal or lingual infiltration of 1.8 mL of 2% lidocaine with 1:100,000 epinephrine to an IANB did not significantly increase anesthetic success in mandibular posterior teeth.¹¹

Rogers BS et al compared the efficacy of 4% articaine with 2% lidocaine for supplemental buccal infiltrations (BIs) after an ineffective IANB in mandibular molars with IP. In addition, the use of articaine for IANB and intraosseous injections was investigated. One hundred emergency

patients diagnosed with IP of a mandibular molar were selected and received an IANB with 4% articaine. All injections were 1.7 mL with 1:100,000 epinephrine. All patients reported profound lip numbness after IANB. Patients with ineffective IANB (positive pulpal response to cold or pain on access) randomly received 4% articaine or 2% lidocaine as a supplemental BI. Endodontic access was initiated 5 minutes after deposition of the infiltration solution. Success was defined as no pain or no more than mild pain during endodontic access and instrumentation as measured on a visual analogue scale. Seventy-four patients failed to achieve pulpal anesthesia after IANB with 4% articaine, resulting in IANB success rate of 26%. Success rates for supplemental BIs were 62% for articaine and 37% for lidocaine ($P < .05$). This effect was most pronounced in second molars ($P < .05$). Supplemental BI with articaine was significantly more effective than lidocaine. The IANB success rate of 4% articaine confirmed published data.¹²

CONCLUSION

From the above results, the authors conclude that both the Gow- Gate technique and the IANB technique are equally effective. However, future studies are recommended.

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