Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.47750/jptcp.2023.30.06. 054

EFFICACY OF DEXAMETHASONE IN LINGUAL NERVE PARESTHESIA FOLLOWING THIRD MOLAR SURGERY-A RANDOMISED CONTROLLED TRIAL

Dr. Raparthy Bhuvana chandra
(Corresponding Author)
Postgraduate, Department of Oral and maxillofacial surgery.
Saveetha dental college and Hospital, Chennai, Tamil Nadu.
Mob: +919573856542
Email id: raparthybhuvan@gmail.com
Dr. Kathiravan Selvarasu
Reader, Department of Oral and maxillofacial surgery.
Saveetha dental college and Hospital, Chennai, Tamil Nadu.
Email id: kathiravan.sdc@saveetha.com
Dr. Vivek D Menon
Ex Postgraduate, Department of Oral and maxillofacial surgery.
Saveetha dental college and Hospital, Chennai, Tamil Nadu.
Email id: vivekdmenon3@gmail.com
Dr. Murugesan K
Professor and head of the department, Department of Oral and maxillofacial surgery.
Saveetha dental college and Hospital, Chennai, Tamil Nadu.
Dr Soorumsetty Ruthvik
Postgraduate, Department of Oral and maxillofacial surgery.
Saveetha dental college and Hospital, Chennai, Tamil Nadu.
Email: soorumsettyruthvik@gmail.com

Submitted: 19 May 2023; Accepted: 08 June 2023; Published: 06 July 2023

ABSTRACT

Introduction : Lingual nerve paresthesia or anaesthesia subsequent to wisdom tooth removal affects a minor number of patients sometimes producing permanent damage. Dexamethasone has an anti-inflammatory action against neuroinflammation.

Materials and Methods : In the present study, 12 patients with lingual nerve paresthesia were divided into 2 groups (with dexamethasone and without dexamethasone). Post operatively at 3 months, the bone defects were assessed for the extent of the repair. Descriptive data was expressed in percentages. Independent t tests and paired t tests were used to assess the association between difference between between groups and within groups respectively and significance was kept at $p<0.05$.

Results : out of 6 patients who received inj dexamethasone , 5 patients showed decrease in paresthesia in 3 months. In 6 patients who did not receive dexamethasone 4 patients showed decrease in paresthesia. Paired t tests were performed to analyse the pre and post bone defects of group I and group II respectively. In both group I and group II, significant changes were seen in the bone defects.

Conclusion : From our study we conclude that its dexamethasone does not significantly alter the paresthesia.

Keywords : paresthesia, steroids, inflammation, wisdom tooth removal.

INTRODUCTION

The Lingual nerve (LN) is a branch of the mandibular division of the trigeminal nerve (V3) that is responsible for general somatic afferent (sensory) innervation. It supplies the mucous membranes of the mandibular lingual gingiva, floor of the mouth and the ipsilateral two-thirds of the tongue. (Thomas, George and Jose, 2020)It also carries specialised taste fibres and parasympathetic innervation to salivary glands. While it should be an infrequently encountered nerve during routine and basic oral and maxillofacial surgical procedures encountered in daily dental practices, its vulnernable position poses a risk of iatrogenic injury. Unfortunately, current treatment options yield minimal success in the improvement or restoration of function of the lingual nerve following injury.

An unwitnessed LN injury will be noted at a postoperative follow-up or by patient complaints or calls to the office. This would mandate a baseline history and neurosensory examination to establish the appropriate management and is essential. The injury should be classified as being either dysesthesia, paresthesia, hypoesthesia, or anaesthesia. The pain and decreased sensation could be quantified on a visual analog scale of 1 to 10 and mapped quickly on a representation of the tongue and floor of the mouth in any clinical chart. In cases where patients complain of intermittent pain, the clinician should be able to determine whether the pain is stimulated or spontaneous. Patients with long-standing injury usually present with constant pain which may be the result of a lack of afferent input from the periphery and also due to the formation of a neuroma (traumatic neuroma). The decreased level of sensation could be quantified on a level of 1 to 10 and compared with the contralateral side. Interference with daily living activities and alteration of taste sensation (parageusia) should be documented.

Clinical Neurosensory Testing is a standardized manoeuvre utilised to objectively assess the degree of sensory impairment, monitor recovery, and determine if micro neurosurgery is required. Clinical Neurosensory Testing should be performed at three levels A, B, and C to assess mechanoreceptive and nociceptive awareness of the affected area. The non-affected side should be tested first to determine the patient's normal responses. The areas that are reported abnormal by the patient should be mapped and the final outline will represent the area of alternated sensation. At level A, large myelinated A-alpha and A-beta were assessed by using fibres brushstroke directional discrimination with constant rate and pressure by using hair brush or fine sable could be used and the patient should be asked to identify the direction of movement (i.e., to the right or to the left). In level B, A-beta fibre was assessed using a Boley gauge with blunt tips to evaluate two-point discrimination. The reference distance should be determined in the normal area based on the closest distance in which the patient could recognize the two points then the affected area is tested. Level C assessed could be evaluated by using a 27-gauge needle or dental explorer tip to assess C fibers and A-delta. Finally, there is an insignificant correlation between altered taste sensation has little with the degree of LN injury

MATERIALS AND METHODS

Study design: Randomised controlled trial

Study setting: The study was conducted in the outpatient department of Oral and Maxillofacial dentistry in a private dental college in Chennai from October 2021 to October 2022.

Study population:

The study population included patients with lingual nerve paresthesia. Thirty patients were randomly divided and assigned to two groups using random sequence allocation in 1:1 ratio as follows : group I patients who received dexamethasone and group II who received placebo.

Inclusion criteria:

- Patients who are 15 years and above who reported back with numbness after 3rd molar surgery were taken into the study.
- Patients who are systematically healthy were included in the study

Exclusion criteria:

- Lactating and pregnant women were excluded from the study.
- Tobacco users were excluded from the study

Ethical clearance:

- Prior to the start of the study, ethical clearance was obtained from the Scientific review board, at Saveetha University.
- Written informed consent was obtained from the study participants.
- The anonymity of the participants was maintained.

Scheduling:
Details of individual cases were maintained in the pro format. Mapping of the paresthesia was done for all the patients. Patients were explained in their native language regarding the treatment procedures

Surgical technique:

The patients were prepared according to the standard surgical protocol. Inj Dexamethasone was injected in the lingual mucoperiosteum area and pterygomandibular Raphae area.

Follow up:

The patient was reviewed after one week of surgery, 3 months, and checked for the presence of paresthesia.

Sample size calculation:

The sample size was calculated by G Power based on the study conducted by K.P. Nakkeeran et al in 2018 [13] with p value 0.05 and 95 power with effect size 0.526. Our calculated sample size was calculated to be 12.

Sampling:

Simple random sampling was done by block randomization to select the study participants. Allocation ratio was kept at 1:1 into two groups. Blinding and allocation concealment were not applicable.

Statistical Analysis:

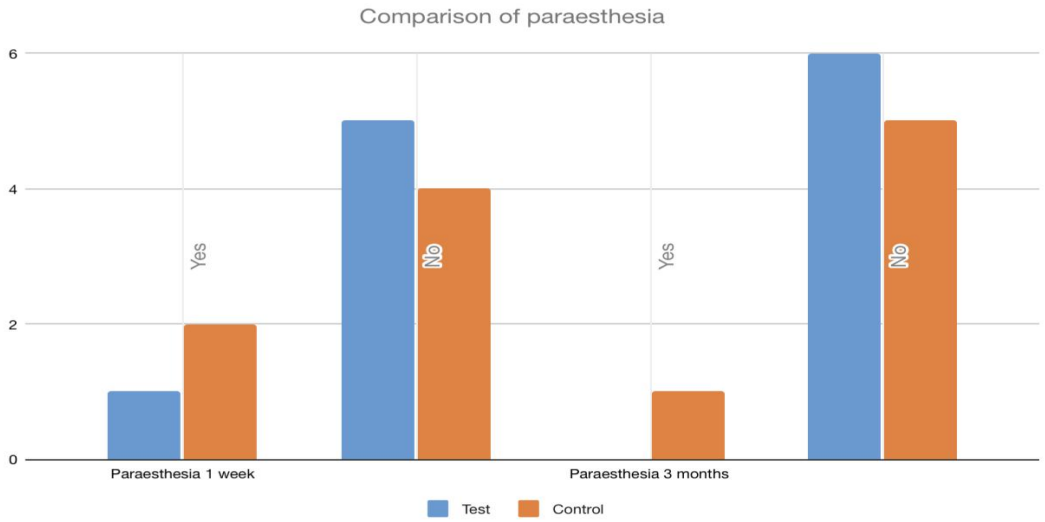
Data was entered in Microsoft excel spreadsheet and analysed using SPSS software (version 23.0). Data was analysed by descriptive statistics which included frequency, percentages, mean and standard deviation with 95% confidence interval. The Shapiro Wilk test was used for assessing the normality of distribution of all parameters. Descriptive statistics were expressed by mean and standard deviation. Analytical statistics included independent t test was used to assess the difference between means of continuous variable between the groups and paired t test was used to assess the difference of means within the groups at $p<0.05$.

RESULTS
This table shows the comparison of change in paraesthesia within each group as well as comparison of paraesthesia between two groups. After 1 week, 1 case in the test group and 2 cases in the control group showed paraesthesia and there was no difference in paraesthesia In two groups after 1 week. After 3 months, no case in the test group and 1 case in the control group showed paraesthesia and there was no difference in paraesthesia In two groups after 3 months. Intragroup comparison of change in paraesthesia showed no difference within each group

Comparison of paraesthesia

Groups	Paraesthesia 1 week		Paraesthesia 3 months		p value
	Yes	No	Yes	No	
Test	1 (16.7)	5 (83.3)	0	6 (100)	1.000
Control	2 (33.3)	4 (66.7)	1 (16.7)	5 (83.3)	1.000
p value	1.000		1.000		--

Chi-square test



DISCUSSION

The lingual nerve provides sensory innervation to the sublingual region, such as the floor of the mouth, as well as the gums and anterior two-thirds of the tongue. It arises from the posterior trunk of the mandibular nerve in the pterygomandibular fossa and initially courses between the tensor veli palatine and the lateral pterygoid muscles, where it receives the chorda tympani branch of the facial nerve. It then passes between the lateral and medial pterygoid muscles, proceeding anteriorly and inferiorly on the surface of the medial pterygoid muscle to lie medial to the body of the mandible, opposite the third molar. Here, at its most superficial point, the lingual nerve lies just beneath the gingival mucosa on the medial surface of the mandible. The lingual nerve then passes anteriorly and medially, across the styloglossus muscle and lateral to the hyoglossus and genioglossus muscles, before coursing upward to divide into terminal branches that supply sensory innervation to the lingual mucosa

Supportive psychotherapy with steroids, antidepressants, and anticonvulsants may be used to treat lingual nerve injury. Most cases of lingual injuries recover within 3 months without special treatment, but some patients have reported permanent lingual nerve injuries [9]. In this case, the patient presented with level 5 paresthesia on the VAS. Therefore, dexamethasone 10 mg was administered, leading to a reduction of paresthesia in the tongue. Dexamethasone has an anti-inflammatory action, which is effective against neuroinflammation and reduction of postoperative pain [10,11]. Moreover, in a pre-clinical study, dexamethasone was shown to effectively aid functional recovery after nerve injury. In another clinical study, steroid administration effectively reduced nerve injury-associated neuroinflammation, leading to accelerated nerve recovery. It has also been reported that early steroid treatment successfully decreases neuroinflammation

CONCLUSION

In conclusion, lingual nerve injury following impacted third molar surgery is rare but can cause irritation to patients, early treatment with dexamethasone will effectively aid the recovery of the injured lingual nerve.

CONFLICT OF INTEREST
Nil

SOURCE OF FUNDING
Self-funded

REFERENCES

1. Fung BK, Chan MY. Incidence of oral tissue trauma after the administration of general anaesthesia. Acta Anaesthesiol Sin. 2001;39:163–167.

2. Gaut A, Williams M. Lingual nerve injury during suspension microlaryngoscopy. Arch Otolaryngol Head Neck Surg. 2000;126:669–671.

3. Alling CC., 3rd Dysesthesia of the lingual and inferior alveolar nerves following third molar surgery. J Oral Maxillofac Surg. 1986;44:454–457.

4. McGeachie JK. Anatomy of the lingual nerve in relation to possible damage during clinical procedures. Ann R Australas Coll Dent Surg. 2002;16:109–110.

5. Silva DA, Colingo KA, Miller R. Lingual nerve injury following laryngoscopy. Anesthesiology. 1992;76:650–651.

6. Kim KJ, Park JW, Baek CW, Jung YH, Koo GH. Hypoglossal nerve palsy following general anesthesia: a case report. Korean J Anesthesiol. 2005;49:702–704.

7. Hwang BS, Hwang BM. Tongue Numbness following Endotracheal General Anesthesia: a case report. Korean J Anesthesiol. 2008;54:350–352.

8. Majumder S, Hopkins PM. Bilateral lingual nerve injury following the use of the laryngeal mask airway. Anaesthesia. 1998;53:184–186.

9. Lang MS, Waite PD. Bilateral lingual nerve injury after laryngoscopy for intubation. J Oral Maxillofac Surg. 2001;59:1497–1499.

11. Gozali P, Boonsiriseth K, Kiattavornchareon S, Khanijou M, Wongsirichat NJ. Decreased post-operative pain using a sublingual injection of dexamethasone (8 mg) in lower third molar surgery. J Dent Anesth Pain Med. 2017;17:47–53. [PMC free article]

12. Sun H, Yang T, Li Q. Dexamethasone and vitamin B12 synergistically promote peripheral nerve regeneration in rats by upregulating the expression of brain-derived neurotrophic factor. Arch Med Sci. 2012;8:924–930.

13. Kim HJ, Ahn HS, Lee JY, Choi SS, Cheong YS, Kwon K. Effects of applying nerve blocks to prevent postherpetic neuralgia in patients with acute herpes zoster: a systematic review and meta-analysis. Korean J Pain. 2017;30:3–17.

14. Kadry MA, Popat MT. Lingual nerve injury after use of a cuffed oropharyngeal airway. Eur J Anaesthesiol. 2001;18:264–266.

15. Teichner RL. Lingual nerve injury: a complication of orotracheal intubation. Case report. Br J Anaesth. 1971;43:413–414.

16. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study, 10.1111/cid.12609, Clin. Implant Dent. Relat. Res.

17. Assessing the variation in course and position of inferior alveolar nerve among south Indian population: A cone beam computed tomographic study, Indian Journal of Dental Research, 10.4103/ijdr.IJDR_418_17

18. Comparative evaluation of the efficacy of intraligamentary and supraperiosteal injections in the extraction of maxillary teeth: A randomized controlled clinical trial, 10.5005/JP-JOURNALS-10024-2391

19. Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study, 10.1016/j.joms.2017.12.020

20. Platelet-Rich Fibrin Used in Regenerative Endodontics and Dentistry: Current Uses, Limitations, and Future Recommendations for Application, 10.1155/2021/4514598

21. Comparative antimicrobial efficacy of oregano oil, chlorhexidine, and sodium hypochlorite against Enterococcus faecalis: An in vitro study, 10.4103/endo.endo_124_20

22. Antioxidant, anti-inflammatory activity of Thymus vulgaris-mediated selenium nanoparticles: An in vitro study, 10.4103/JCD.JCD_369_21

23. CBCT comparison of buccal shelf bone thickness in adult Dravidian population at various sites, depths and angulation – A retrospective study, 10.1016/j.ortho.2021.06.001

24. Evaluation of effect of submucosal administration of depomedrol in management of

postoperative sequelae in mandibular fractures: A randomized clinical trial study, 10.4103/njms.NJMS_118_20

25. Comparison of effect of intra socket ketamine and tramadol on postoperative pain after mandibular third molar surgery, 10.4103/njms.NJMS_141_20

26. Twin Mixed Local Anesthesia in Third Molar Surgery - Randomized Controlled Trial, 10.1016/j.joms.2021.07.013