

Post Anesthetic Injection Trismus – A Questionnaire Based Study

Dr Sweta Shaw 3rd year postgraduate in department of Oral and Maxillofacial Surgery

Dr Richi Burman Professor in department of Oral and Maxillofacial Surgery

Dr Samiran Ghosh Professor in department of Oral and Maxillofacial Surgery

Dr Avishek De Sarkar Reader in department of Oral and Maxillofacial Surgery

Dr Shreya Karan 2nd year postgraduate in department of Oral and Maxillofacial Surgery

Abstract

The aim of the present study is to evaluate the factors resulting trismus following local anesthetic injections. It was a questionnaire based study comprised of 20 questions on google form shared amongst 100 dental practitioner of West Bengal. Data thus obtained were evaluated statistically. According to present study, the complication of trismus after local anesthetic injection may be prevented by the use of short needles for maxillary posterior injections, and by the avoidance of multiple injections in a short period of time and thus having a sound knowledge on surgical anatomy of the injection site.

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I. Introduction

Trismus refers to the restriction of the range of motion of the jaws. Commonly referred to as "lockjaw," trismus typically stems from a sustained spasm of muscles of mastication. Although unilateral restriction may occur, by definition, trismus is a bilateral process that results from increased tone mediated by the efferent portion of the reflex arch of the trigeminal nerve. Trismus is usually temporary and typically resolves in less than two weeks, but permanent trismus may also occur, interfering with everyday activities such as speaking, eating, and even swallowing. Normal jaw opening is greater than 30 to 40 mm. Trismus has been defined as a mouth opening less than 40 mm; others have described it as an opening to 15 to 30 mm, or even less than 20 mm. Additionally, some authors have graded trismus according to visual assessment of mouth opening (light/moderate/severe or grades 1 to 3, again corresponding to mouth opening). Its incidence is vastly variable and dependent on the inciting etiology.[2]

The pathophysiology behind trismus is as follows, the muscles responsible for mouth closure, namely the masseter, temporalis, and medial pterygoid muscles, exert a force 10 times greater than the muscles that open the mouth, including the lateral pterygoid, digastric, and hyoid muscles. Innervation for the majority of these muscles is provided by the mandibular division of the fifth cranial nerve. The muscle groups that control jaw opening and closure act in antagonism, as neurogenic stimulation of one group causes reflex neural inhibition of the other. While the inciting insult may be unilateral, the reflex activated is bilateral.[1]

The aim of the present study is to evaluate the factors related to post anesthetic injection trismus that is not surgical but the iatrogenic cause and also is to find out various factors that can contribute to post extraction trismus like (1) Low-grade infection postadministration of local anesthetic agents (2) Multiple needle (3) At times, the patient hurts his/her own tongue or cheek under the effect of anesthesia resulting in reflex trismus. It emphasizes on the importance of proper injection technique to avoid post injection trismus

II. Material And Methods

A survey consisting of 20 questions composed in a google form, for evaluating the incidence, prevalence, of post injection trismus, shared amongst 100 dental practitioners of West Bengal. The responses of all the participants were stored and documented on a spreadsheet. The data thus obtained were evaluated and analysed statistically.

III. Result

Amongst all 100 responses received, 89% of dental practitioner had experienced post aesthetic injection trismus, of which 35% of practitioner had an experience of 5-10 years, 25% had an experience of more than 15 years, while in rest 11% practitioner had not experienced any post anesthetic injection trismus, amongst

which ,40% of which had an experience of more than 15 years ,another 40 % had an experience of less than 5 years ,rest 10 % had an experience of 5-10 years and 10-15 years.

Of all 89% practitioner who had experienced post anesthetic injection trismus approximately 44% performed 30-50 nerve blocks per week and 16% performed more than 50 nerve blocks per week.

In present cross-sectional study,50% of practitioner found that gender predilection and age distribution played an important role in post anesthetic injection trismus, with 56% been the female patients and the most common age groups to be affected by post anesthetic injection trismus were 30years-40years who accounted for 64% in the whole study. However on statistical analysis no significant differences were found in gender predilection.

The most commonest time of the onset of trismus following the post anesthesia were found to be 5th - 7th day followed by 2nd -4th day while, trismus on first post operative day were minimum.

In the present study only 16% of practitioner associated the volume of solution of local anesthesia used with occurrence of trismus while rest 84% did not found any association between volume deposited and the trismus. Only 18% of practitioner associated that season played an important role in post anesthetic injection trismus ,of which occurrence of trismus were more in winter season when compared to summer and spring season.

69% practitioner experienced post anesthetic injection trismus following positive aspiration while performing nerve block.

Of all techniques of nerve block ,95% of post anesthetic injection trismus were associated with IANB nerve block while 5% were associated to PSA nerve block technique which were significantly higher in cases of IANB nerve block with a p value of 0.001.

In About 65% of patients medial pterygoid were found to be tender followed by tenderness of both medial and lateral pterygoid in about 30% and in rest 15% of patients lateral pterygoid following the trismus after injection. However no significant differences on statistical analysis were found .

58% of practitioners used chlorzoxaone as a muscle relaxants for treating post anesthetic injection trismus followed by 28% used Thiocolchicoside as a muscle relaxant for treating trismus

Of all the sedatives 64% practitioner used diazepam for treating post anesthetic injection trismus followed by clonazepam and alprazolam

Amongst all NSAIDS most frequently used was diclofenac which were preferred by 38% practionnaire for treating post anesthetic injection trismus, followed by aceclofenac and paracetamol .

IV. Discussion

In our study we found females were more affected than male ,however current literatures did not revealed any significant effect of gender on postanesthetic injection trismus.

In present study age group to be more affected of post anesthetic injection trismus were 30-40 years , however no literature in support of it were found

In present study most of the anesthetic trismus were found in IANB nerve block followed by PSA. Inferior alveolar nerve block and posterior maxillary infiltration injections are known to be associated with the complication of trismus.' Both involve the penetration of muscle and the deposition of anesthetic solution into a highly vascular space. The needle used for the posterior maxillary injection may pass through the lateral pterygoid muscle near the lateral pterygoid plate. The mandibular nerve block may sometimes involve the medial pterygoid and the temporalis muscles. In both instances, a small amount of intramuscular hemorrhage may result in mild discomfort when the anesthesia wears off. There is a greater risk of bleeding after a posterior maxillary injection when a 1-inch needle is inserted to its full length. The tip will then pass the lateral pterygoid muscle and enter the vascular pterygomaxillary fissure region. These can often be prevented by the use of short needles for maxillary posterior injections.[3]

The present study indicates that the onset of trismus was at 5th to 7th days which were in accordance to given literature suggesting that onset of trismus was at 2nd -5th days, and described following reasons for the same as anaesthetic solutions are usually cytotoxic and can cause inflammation inside the affected muscle and trismus .[5]

No correlation between the volume of anesthetic solution deposited and the trismus were found.However literature suggest that the volume of the LA solution injected into this space can lead to the stretching of the medial pterygoid which may initiate this spasmodic contraction. That means most of the practitioner were unaware of the fact regarding the association of volume of solution of local anesthesia used with occurrence of trismus.

In the present study muscles that is found to be tender is medial pterygoid followed by both medial and lateral pterygoid muscles.The muscles responsible for mouth closure, namely the masseter, temporalis, and medial pterygoid muscles, exert a force 10 times greater than the muscles that open the mouth, including the lateral pterygoid, digastric, and hyoid muscles. Innervation for the majority of these muscles is provided by the

mandibular division of the fifth cranial nerve.. While the inciting insult may be unilateral, the reflex activated is bilateral.[1]

The most important clinical landmarks used in the location of the inferior alveolar nerve block are the coronoid notch and the pterygomandibular raphe. The preferred site of needle insertion lies between these two landmarks and the point of insertion is determined by simple measurements. The needle should be withdrawn 2 mm and then aspiration is performed before the local anesthetic is deposited. The penetration depth of the needle usually ranges from 19 to 25 mm; insertion of the needle more than 25 mm may indicate that its position is more medial towards the posterior border of the mandible causing injury to medial pterygoid and hence initiating trismus .[2]

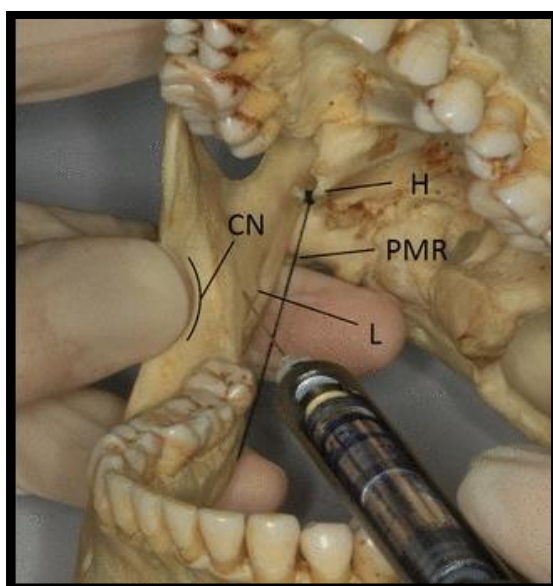


FIG 1- showing the position of needle insertion in IANB .(CN = Coranoid Notch, PMR= Pterygomandibular Raphe , H = Hamulus)

Most of the practitioner found a correlation between the positive aspiration and the trismus following nerve block . Literature quoted that the accidental injury to vascular area results in vascular damage followed by hematoma,these extravasation of blood results in tissues irritations and muscles dysfunctions resulting in low grade infection and thus inducing trismus.[3]

In the present study,chlorzoxaone and diazepam was most frequently used muscle relaxant, for analgesic diclofenac were preferred.

Symptom-directed interventions, including heat therapy, analgesics such as non-steroidal anti-inflammatory agents, and muscle relaxants, are usually prescribed in the acute phase and have been described as mainstays for treating uncomplicated transient trismus. Heat therapy includes applying moist hot towels for 15 to 20 min per hour.When it comes to analgesics, diclofenac is usually sufficient.When a muscle relaxant is needed, a benzodiazepine, such as diazepam, is recommended: 2.5 to 5 mg three times per day.The clinician should also encourage a soft diet for the duration of the pathology.[1]

Stretching exercises are indicated after the acute phase or in patients with post-injection or iatrogenic a trismus, particularly when persisting longer than one week. The exercises typically consist of repeated attempts to open the mouth against applied resistance, usually divided into multiple sessions per day. Physiotherapy includes opening and closing the mouth and lateral movements for 5 min every 3 to 4 hr. Sugar-free chewing gum can be indicated to stimulate lateral movements.[1]

V. Conclusion

These study emphasizes on the importance of proper injection technique to avoid post injection trismus and to avoid iatrogenic cause resulting in injection trismus .These can be prevented by adopting proper armamentarium .While performing a nerve block there should be a sound knowledge regarding surgical anatomy,selection of proper gauge of needle ,by the avoidance of multiple injections in a short period of time.Most of the practitioners were not aware of the complications following the use of local anesthetic solutions from the same vials for multiple times and also about the resistance during anesthesia and its correlations to injection trismus . It must be emphasized that long standing trismus can result in low grade infections in submasseteric space that may proceed to osteomyelitis. Most importantly practitioner should be

aware about the fact that there is as such no specific treatment for post injection trismus , more of the focus should be given to passive therapy rather than switching directly onto medications.

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ANEXURE 1 (QUESTIONNAIRE)

1. After which nerve block have you experienced post injection trismus most commonly in your practice ?
2. How many procedures of the above mentioned nerve blocks do you perform per week ?
3. In your experience , is positive aspiration during nerve block associated with occurrence of post injection trismus in your practice ?
4. Do you associate any specific gender with occurrence of post extraction trismus?
5. Do you associate any specific age with occurrence of post injection trismus?
6. What is the commonest time of onset have you noticed trismus following Local Anesthetic injection?
7. Do you associate volume of solution of local anesthesia used with occurrence of trismus ?
8. Do you associate any seasonal variations with occurrence of post injection trismus ?
9. If YES , then in which season have you experienced maximum cases of post injection trismus ?
10. Do you associate resistance during LA administration with occurrence of post injection trismus?
11. Which muscles do you most commonly find tender in the patients experiencing trismus following local anesthetic administration?
12. Which category of medications do you commonly prescribe in such patients?
13. In your experience , how much time do patients of post Local Anesthetic injection trismus take for recovery?
14. What Physical Therapy do you commonly prefer in your patients experiencing post injection trismus ?
15. What muscle relaxants do you use frequently for treating post LA injection trismus?
16. What sedatives do you use frequently for treating post LA injection trismus?
17. What NSAIDs do you frequently use to treat post LA injection trismus ?

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