Original Article

Trigeminal Neuralgia

Management of Trigeminal Neuralgia Pain by Peripheral Absolute Alcohol Nerve Block among Oral & Dental Patients at Victoria Hospital/Quaid-e-Azam Medical College, Bahawalpur

Muhammad Safdar Baig[1], Musadaque Hussain [2], Muhammad Amjad Bari[4] and Muhammad Arshad[3]

ABSTRACT

Objective: To determine peripheral absolute alcohol nerve block for the management of trigeminal nerve pain and its complication among oral and dental patients

Study Design: Descriptive / cross sectional study

Place and Duration of Study: This study was conducted at Dept of Oral and Dental Surgery along with few referral from the Neuro-Surgery at Bahawal Victoria Hospital a tertiary care hospital attached with the Quaid-e-Azam Medical College, Bahawalur in Southern Punjab from January 2013 to December 2015.

Materials and Methods: A total of 125 patients have been included Before administering the peripheral alcohol nerve block 1.8ml of lignocaine local anesthesia injection was given to anaesthetize patient nerve involved. The study subjects consists of the patients suffering from trigeminal neuralgia diagnosed clinically based on specific signs and symptoms of neuralgia pain. The study variables were duration of pain relief by peripheral nerve block and any complication, duration of re-injection to measure repeated nerve block, study subject age, gender, area of residence, socio-demographic characteristics, patients history of therapeutic treatment. Data was collected on specifically designed questionnaire and analyzed on SPSS 20.0 and presented in tabulated form as frequencies of the above mentioned variable along with their percentages, mean and standard deviations.

Results: Total of 125 patient hospital records who received absolute alcohol with history of re-injection has been included in this study. Peripheral absolute alcohol nerve block was effective ranging from minimum of 3 to 17.45 months, the mean duration of pain relief was 8.35 months with standard deviation of 4.5 months and there was gradual decrease in the pain relief after repeated re-nerve block from our study data set. Some of the patients were referral from Dept of Neurosurgery of our institution who were not fit for neurosurgery, so advised for local peripheral absolute nerve block. There was no significant report of complication except mild to moderate pain, swelling, trismus, burning sensation, dysesthesia, fibrosis of soft tissues and only 04 subjects report of injection site infection.

Conclusion: Absolute alcohol nerve block to be less invasive in dental office management and relatively more efficacious for neuralgia pain relief to reduce patient morbidity and cost effective for patients who do not have relief on conventional carbemazipine drug therapy and being disease of elderly age who are usually medically compromised as not being fit for surgery or willing for relatively costly and invasive neurosurgery procedure.

Key words: Absolute alcohol, Nerve block, Trigeminal neuralgia, Pain management

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INTRODUCTION

Trigeminal Neuralgia has been described as lancinating, paroxysmal attacks of annoying pain in the distribution of 5th cranial nerve in its one or more branches called tic-douloureux from literature search due to neurovascular origin zone.[1] From the ancient history the neuralgia pain has been reported to exist since hundred years to be recognized as most severe type of the pain experienced by the humans as crippling disease condition for the patients with fear of its recurrence.[2] It has been noticed as relapsing attack of pain in the beginning which last for shorter duration of time to months as pain free interval with gradually shorter duration of time, in which patients feels difficulty in eating, talking with very compromised condition with much anxiety and depression state of life.[3] Despite that fact that due to lot of advances in pain management, neuralgia pain still remains an unsolved issue as

[1.] Department of Oral & Dental Surgery Neurosurgery[2] / Neurosurgery[3], Quaid-e-Azam Medical College and Bahawal Victoria Hospital Bahawalpur,
[4.] Department of ___, Nishtar Institute of Dentistry, Multan

Correspondence: Dr. Muhammad Safdar Baig,
Assistant Professor of Oral & Dental Surgery, Quaid-e-Azam MC and Bahawal Victoria Hospital Bahawalpur
Contact No: 0300-6821103
Email: safdarbeg@gmail.com

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successful pain relief for most of the patients. Still the drug of choice is carbamazepine as standard first line diagnostic and therapeutic drug as well along with baclofen, phenytoin, gabapentine and sodium velproate.[4]

It has been noticed that initial pain relief by the above mentioned drugs deceases gradually with appearance of these drugs side effects, it is not possible for the patient to continue them and has to opt for neurosurgery or some injection.[5] According to literature search crabamazepine alone have been found to be effective around 70 percent for the treatment of trigeminal neuralgia by Taylor et al. in their study for 16 years follow up among 143 patients, however there are reports of this drug resistance as well, which require further surgical or some injectable treatment.[5, 6] among the surgical operative treatments are the neurectomy of nerve involve, radiofrequency called thermal rhizotomy, nerve ballon micro-compression, gamma knife nerve surgery and the most common treatment by neuro surgery called micro-vascular decompression MVD that have relatively high rate of long term success for patients who are medically fit.[7] The medical treatment option with nerve block with some injectable chemical like absolute alcohol, anhydrous glycerol, phenol and tetracaine etc have also been in use for trigeminal neuralgia management.[8]

The use of peripheral nerve block with absolute alcohol most common by the dental surgeons for the medically unfit patients who cannot go under invasive surgical procedure because of their serious morbidity and at the same time more cost effective for the non-affording patients as well.[9] The rationale of our study was base upon the fact that the intensity of the trigeminal neuralgia pain is very severe, which require early diagnosis with immediate remedy in dental surgery. As it is disease of relatively older age with co-morbid and infirm medically condition, when patients are not fit for surgical procedures.[10] There have been report of recurrence of the trigeminal neuralgia pain even after neuro-surgical procedure,[11] while the peripheral absolute nerve block is relative simple, more cost effective, minimal invasive technique with immediately pain relief for the patients ranging from period of about 6 to 16 months with almost no major complication on repeated use.[11, 12]

MATERIALS AND METHODS

This study has been conducted using a retrospective hospital based upon patient record attending Dept of Oral and Dental Surgery along with few referral from the Neuro-Surgery at Bahawal Victoria Hospital a tertiary care hospital attached with the Quaid-e-Azam Medical College, Bahawalur in Southern Punjab – Pakistan. A total of 125 patients have been included as our study subjects regardless of age and gender for data analysis from 1st January 2013 to 31st December 2015 who fulfill our study inclusion and exclusion criteria based on a semi structured questionnaire specifically develop for this purpose. The diagnosis of the trigeminal neuralgia patients was base upon detailed oral and dental clinical examination according to standard protocol in collaboration with Neuro Surgeery Dept of our institution with the help of few investigation like panoramic OPG X-Rays, CT Scan and MRI where indicated to rollout any local pathology or brain lesion either primary or secondary and at the same time any history of trauma for trigeminal nerve injury as well in consultation with Neurosurgeon.[13]

We have included subjects with history of trigeminal neuralgia of the maxillary and mandibular division of the TN nerve, the case of ophthalmic division was excluded from our study data analysis. It was reveled from our study that the subjects remained under treatment of different dept physicians and surgeon for their pain relief on different medication regimen. Most of the patients have used maximum doses of the medication like carbamazepine, baclofen and gabapentine along with phenytoin sodium and majority of them either do not have proper record of their follow up or some with missing information presenting with history of drug resistance but no history of absolute alcohol injection.[14] A written informed consent of the patients was obtained as part of ethical concern on the structured questionnaire before administering them absolute alcohol injection along with record keeping of other study variables and parameters for data analysis purpose later on SPSS 20.0

Standards operating procedure was developed for the administering of the absolute alcohol nerve block and its peripheral infiltration at the site of neuralgia pain first confirmation by the local anesthesia of lignocaine 2 percent about 1.8ml with adrenaline dilution of 1:100000 at least for 20 to 25 minutes before as diagnostic evaluation and later on absolute alcohol injection was given as nerve block or infiltration at the same site of trigger zone very carefully and slowly about 1 to 1.5ml solution.[15] As all this process of local anesthesia and absolute alcohol injection was carried out by the principal investigator himself or trained senior dental surgeon at dental outdoor. An intraoral approach was used for administering the inferior alveolar nerve block and peripheral infiltration for the infra-orbital and mental nerves with a dental syringe needle of 25/27 gauge short or long depending upon for nerve block and local infiltration accordingly.[16] The study subjects were issued follow up cards along with brief history sheet with first follow up with in 24 to 48 hours, then within a week time, followed by 4-6 week, then after 2-3 months and after every 6 months. The efficacy of the absolute alcohol injection was measured as efficacious if it remained effective to keep patient pain at least for about 2-3 months.[17]

RESULTS

From our hospital record we had total of 152 patients and there were 27 patients with loss to follow, so their information was excluded from the data analysis from our data set. The remaining 125 had their record of follow up and they were given total 257 injections of absolute alcohol ranging from 2-4 injection per patients. The study subjects age range from 33 to 76 years and with mean age of 46.5 years with standard deviation of 8.35 years. The overall success rate came out to be 86.7% while the ineffective rate was 13.3%. Out of these 125 subjects 55.2% were males and 44.8% were females, 28.8% of the patients belong to urban area and 71.2% were from the rural areas, majority of the patients with in 4th (17.6%) to 5th (34.4%) decade of life (Tables 1).

It is evident from the results of our study that most of the time mandibular division of the trigeminal nerve was involved 54.4% as compared to the maxillary division 39.2% terminal branches, while only 6.4% of the times it was involved in both maxilla and the mandibular division. Similarly the most of the terminal branch involved was the inferior alveolar nerve 47.2% and next was the infra orbital nerve 35.2% while the other long buccal, sub-mental and supra orbital nerve were 5 to 6% involvement in neuralgia pain (Table 2). Our study results also revealed that the right side of the nerves infra orbital 38 (77.55%) was mostly involved as compared to the left side 11 (22.44%) similarly inferior alveolar nerve 45 (66.17%) on the right side while only 12 (17.64%) on the left side (Table 3). The peripheral absolute nerve block injection remained effective from 3 to 16 months for the infra orbital nerve, while it was effective from 6-22 month for the inferior alveolar nerve block and the overall effectiveness was 86.77 % both in the maxillary and the mandibular divisions (Table 4).

Table No.1: Socio-demographic distribution of trigeminal neuralgia patients

Variable	No.	%age
Study subjects (n=152)		
Three year follow-up	125	82.3
Loss to follow-up	27	17.7
Gender (n=125)		
Male	69	55.2
Female	56	44.8
Area of residence (n=125)		
Urban	36	28.8
Rural	89	71.2
Age (n=125)		
3rd decade	8	6.4
4th decade	22	17.6
5th decade	43	34.4
6th decade	36	28.8
7th decade	16	12.8

Table No.2: Distribution of site and nerve involvement in neuralgia

Variable	No.	%
Site involvement (n=125)		
Maxillary division	49	39.2
Mandibular division	68	54.4
Both divisions	8	6.4
Nerve involvement (n=125)		
Infra-orbital	44	35.2
Supra-orbital	7	5.6
Inferior alveolar	59	47.2
Long buccal	7	5.6
Sub-mental	8	6.4
Effectiveness of therapy (out of total 257 Inj.)		
Effective	223	86.7
Ineffective	34	13.3

Table No.3: Distribution of the nerve side involvement in trigeminal neuralgia pain

Nerve side in TN involvement	Maxillary nerves	Mandibular branches of nerves		
	Infra orbital (n=49)	Inferior alveolar (n=57)	Submental (n=8)	Long buccal (n=7)
Right side	38	45	5	5
Left side	11	12	3	2

Table No.4: Distribution of neuralgia pain management effectiveness out of total 257 injections

Total injection (n=257)	Maxillary nerves	Mandibular branches of nerves		
	Infra orbital (n=77)	Inferior alveolar (n=96)	Submental (n=36)	Long buccal (n=48)
Effective (n=223)	67	54	31	41
Ineffective (n=34)	10	12	5	7
Duration of effect (months)	16 months (3-16 months)	22 months (6-22 months)	11 months (2.5-11 months)	9 months (2-9 months)

DISCUSSION

There has been consensus about the fact that it is most annoying pain as per its intensity and is usually initiated from the terminal braches of the nerve involved as the trigger zone. It has also been determined that the use of anticonvulsant drugs like carbamezapine have its diagnostic and therapeutic value as medical treatment of neuralgia pain, similarly it is common practice in oral and dental surgery the use of peripheral injection of local anesthesia 2% lignocaine for the diagnosis of acute pain of trigeminal neuralgia.[18] Later on followed by the absolute nerve block for the identified peripheral trigeminal nerve involved as trigger zone for neuralgia pain relief for relatively longer time duration in our study settings where appropriate neurosurgery treatment option is not available or within the access of the patients due to affordability or morbid conditions,

the peripheral absolute nerve block is still consider to be better option for patients immediate pain relief.[19]

The dental surgery literature review also reveals the indication for absolute alcohol nerve block for neuralgia pain among older age patients, usually unfit for surgery, socioeconomics some cultural reasons, long waiting time for surgery, when patients refuse it for multiple reasons, e.g., females with pregnancy, such patients are consider to be suitable candidate for this minimal invasive procedure as routine dental outdoor just by injection of alcohol.[18, 19] It is also quite well known from the scientific literature that frequent use of absolute alcohol injection is highly toxic for the tissues that is why safe techniques have been developed for its administration so that it should not be directly injected into the vein and the repeated multiple injections leads to soft oral tissues fibrosis as well.[20] Another complication evident from the literature, which is also pointed out by our study results is the fact that there is gradual reduction in the efficacy following its repeated use in terms of shorter duration of pain relief.[21]

There are important findings from the results of this study which are in consistent with the finding of other studies as well. The overall efficacy of the absolute alcohol injection is 86.77% from our study results which is close to the results of Gallagher et al. published in Ireland Journal of Medicine in 2005, according to their results the pain relief was at least for 10 months by absolute alcohol nerve block for inferior alveolar and infra orbital nerves.[12, 22] The overall maxillary division was anesthetized 39.2% and the mandibular division around 54.4% this finding from our study is also in consistent with the results other studies as well.[22] The result of our study that there is gradual decrease in the time period for the effectiveness of the absolute alcohol nerve block is also evident from Khetab et al form their study on 242 subjects follow up for pain management of trigeminal neuralgia published in Pakistan oral and Dental Journal in 2005.[23] The results for studies of Mckenezie, Stookey Ransohoff et al reported the evidence of localized soft tissue fibrosis at the site of the repeated absolute alcohol injections, which is consistent to our study results as well.[7, 24]

CONCLUSION

The management of trigeminal neuralgia by peripheral absolute alcohol nerve block to be better option as being simple, safe and can be carried out at dental office which gives relief to patients from the annoying pain for a minimum of 2.5 months to about 16 months. Although, there has been gradual decrease in the period of pain relief on repeated history of alcohol injection but no any serious side effects other than mild to moderate swelling and soft tissue fibrosis. It has also been determined that even the patients prefer for absolute alcohol reinjection if the pain reoccurred in spite of invasive surgery as it proved be safe for the elderly patients who are usually medical compromised and also not willing to go for neurosurgery procedure in our setting.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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