ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

www.surgicalneurologyint.com

Surgical Neurology International

Editor-in-Chief: Nancy E. Epstein, MD, Clinical Professor of Neurological Surgery, School of Medicine, State U. of NY at Stony Brook.

SNI: Neuroanatomy and Neurophysiology

Editor
Seyed Ali Khonsary, MD
University of California at Los Angeles, Los Angeles, CA, USA

SNI
Open Access

Original Article

Evaluation of anxiety disorder in patients with trigeminal neuralgia

Saman Baghaei[1], Fatemeh Lavaee[2], Azadeh Roosta[1], Delara Amiri[1]

[1]Student Research Committee, [2]Oral and Dental Disease Research Center, Department of Oral and Maxillofacial Disease, School of Dentistry, Shiraz University of Medical Sciences, Shiraz, Iran.

E-mail: Saman Baghaei - saman.baghaei@yahoo.com, *Fatemeh Lavaee - fatemeh.lavaee@yahoo.com; Azadeh Roosta - azaderoosta@yahoo.com; Delara Amiri - amiri.deli78@gmail.com

***Corresponding author:**
Fatemeh Lavaee,
Oral and Dental Disease Research Center, Department of Oral and Maxillofacial Disease, School of Dentistry, Shiraz University of Medical Sciences, Shiraz, Iran.

fatemeh.lavaee@yahoo.com

Received : 06 May 2023
Accepted : 11 July 2023
Published : 28 July 2023

DOI
10.25259/SNI_394_2023

Quick Response Code:

ABSTRACT

Background: The aim of this cross-sectional study was to evaluate the relationship between anxiety levels and severity of trigeminal neuralgia (TN) disorder's chronic orofacial pain during 2019–2020 in Shiraz Dental Faculty.

Methods: In this study, patients with TN disorder who were referred to the Oral Medicine Department of Shiraz Dental Faculty were evaluated. Individuals were selected based on convenience sampling. Finally, 47 patients with TN were recruited in this study. Satisfaction with treatment was recorded based on controlling the patient's pain, age, sex, and frequency of recurrence, and data were analyzed using SPSS18. The Chi-square test was used to compare the final results. A reliability of more than 95% was considered significant ($P < 0.05$).

Results: According to the results, the mean ages of participants with TN and control groups were 56.89 ± 10.93 and 37.12 ± 9.55, respectively. The mean value of participants' age was significantly different between the two evaluated groups ($P < 0.0001$). The anxiety of patients with TN was significantly higher than the healthy control group ($P < 0.0001$). The mean level of anxiety in patients with TN and also in healthy controls was not significantly different among men and women ($P > 0.05$). The mean level of anxiety of men and women in TN group was significantly higher than the healthy control women ($P = 0.001$). The mean levels of anxiety between different age ranges in patients with TN and healthy controls were not different in both evaluated groups ($P > 0.05$). Patients with TN in different age ranges had higher level of anxiety than healthy controls ($P < 0.05$).

Conclusion: Patients with TN had significantly higher level of anxiety than healthy participants.

Keywords: Anxiety, Stress, Trigeminal neuralgia

INTRODUCTION

Trigeminal neuralgia (TN) is a common neuralgia with paroxysmal, shock-like pain. The pain is located in distributions of different branches of the fifth cranial nerve. Short-period attacks are followed by painless periods between pain attacks.[14] The definite cause of TN is unknown, although space-occupying masses including pontine angle tumors, vascular malformations, and inflammation may be responsible for 10% of TN cases.[19] The pain is evoked spontaneously or by trivial stimulation such as shaving, washing, and talking.[26,31] Since the attacks are severe and may be intolerable, they may stimulate TN noticeably, as well as the body.[26] Any threat may activate anxiety as a warning system which prepares the mind and body for expressing suitable reactions. Anxiety

and stress could be considered as TN stimulator, which is under evaluation by psychoimmunologic studies.[42] TN can mimic dental pain and may lead to unnecessary dental treatments; so, it is usual for dentists, especially for oral and maxillofacial medicine specialists to differentiate dental pain and TN.[2] The first step of pharmaceutical treatment of patients with TN in the aspect of oral and maxillofacial medicine specialists is anticonvulsants such as carbamazepine, oxcarbazepine, gabapentin, and so on. Other non-pharmacologic treatments, including laser, acupuncture, cryotherapy, sclerotherapy, and finally surgery such as nerve block, microvascular decompression, and Gamma Knife are considered in the next step if pharmacologic treatments could not control patients' pain.[36] In Iran, neurosurgeons participate in surgical treatments while neurologists treat patients with TN besides oral and maxillofacial medicine specialists. Patients with dental symptoms are referred to dentists for distinguishing the pain origin. These patients will be treated in dental service. On the other hand, neurologists are another active referral center.

Daroff *et al*. introduced stress as a defensive response against stimulations and if these stimulations excess the body's adaptive mechanism, disabling diseases and even death may occur. Anxiety and stress can activate the central mechanism, the adrenal cortex hypothalamus axis. The autonomic nervous system controls chronic, severe, and uncontrolled anxiety which can lead to some diseases.[8]

The relationship between neuroendocrine (hypothalamic pituitary adrenal axis) and inflammatory immune system has been revealed.[8]

The patients with temporomandibular disease and pain had higher cortisol serum level.[10,40] Furthermore, Yoshihara *et al*. reported higher serum levels of cortisol, adrenaline, and noradrenaline in patients suffering from myofascial pain.[38]

The prevalence of migraine in patients with panic disorders was more significant. In addition, anxiety disorders were more prevalent in patients with migraine.[38] Other studies reported that these patients have been affected by depression and anxiety disorders more prevalently.[15]

Due to the inevitable role of stress and anxiety in our lives and their known effects on inflammatory diseases such as rheumatoid arthritis and lupus erythematous,[6,20] in this research, we aimed to assess the anxiety level in patients with TN.

MATERIALS AND METHODS

This cross-sectional study has been performed on 47 patients with TN during 2019–2020. The patients had been referred to the Oral and Maxillofacial Department of Shiraz Dental Faculty.

After confirmation of their problem by a specialist, and signing the written consent form, the anxiety level has been assessed by the Hamilton questionnaire.

Patients with psychiatric disorders such as depression, and bipolar disorders, and patients under treatment for such diseases and anxiety disorders have been excluded from the study. Participants who had consumed any medication with a potency of affecting anxiety were excluded too.

Participants of TN group were selected by convenience sampling. Finally, 47 patients with TN were recruited in this study. On the other hand, 40 healthy persons with no emotional criteria were enrolled as central group. Considering TN patients, the status of their pain and demographic data has been registered from their files.

The Hamilton Anxiety Rating Scale is a popular questionnaire for measuring anxiety symptoms and Kar severity.[17] The Persian version of the Hamilton has been used in our study, and the data have been analyzed by SPSS version 18. Its distribution was normal according to Kolmogorov–Smirnov (KS) test. Furthermore, an independent *t*-test has been used for comparing the mean value of anxiety between two evaluated groups and between men and women. One-way analysis of variance (ANOVA) and Fishers test have also been used for evaluating the anxiety level between different age ranges of participants.

This questionnaire has been used widely. It is a clinician-based self-secured survey. This questionnaire has 14 items including both psychological and somatic symptoms following: anxious mood, tension, fear, insomnia, intestinal, depressed mood, somatic (muscular), somatic (sensory), cardiovascular symptoms, respiratory, gastrointestinal, genitourinary and autonomic symptoms, and behavior at interview.

The final score is calculated from 56. A total score of <14 is indicative of mild anxiety, 18–24 is considered as mild to moderate, and 25–30 shows moderate to severe anxiety.

RESULTS

In this cross-sectional study, 87 participants have been enrolled, including 47 patients in TN group and 40 healthy persons in control group.

The data were analyzed by SPSS version 18. Moreover, parametric independent *t*-test and ANOVA test were used for data analysis ($P < 0.05$ was considered meaningful). The normality of data distribution was assessed by KS test, which was normal.

Table 1: The anxiety level of both TN and control groups.

Participants groups	Number	Mean level of anxiety	Standard deviation	*P*-value
Control	40	7.75	6.67	<0.0001
TN	47	17.91	8.51	

TN: Trigeminal neuralgia

Table 2: The mean value of anxiety in men and women of both participants with TN and control group.

Participants groups	TN group	Standard deviation	Percentage	Mean level of anxiety	Control group	Standard deviation	Percentage	Mean level of anxiety	*P*-value
Men	26	8.51	55.30	18.61	19	7.49	47.50	9.1	0.536
Women	21	8.64	44.70	10.04	21	5.18	52.50	6.52	

TN: Trigeminal neuralgia

Table 3: The mean level of anxiety between different age ranges in both groups.

Age	Statical index						*P*-value
	TN			Control			
	Number	Mean	Standard deviation	Number	Mean	Standard deviation	
31–40 y/o	4	19.25	11.5	15	9.8	9.07	0
41–50 y/o	12	19.25	9.99	12	7.16	3.56	0.004
51–60 y/o	13	18.25	8.52	10	6.4	5.69	0.002
Over 60 y/o	18	16.55	7.3	3	4.33	4.16	0.018
Total	47	17.91	8.51	40	7.75	6.67	0

TN: Trigeminal neuralgia, y/o: years old

Participants' mean age with TN and control groups were 56.89 ± 10.93 and 37.12 ±9.55, respectively. Furthermore, the mean value of participants' age was significantly different between the two evaluated groups ($P < 0.0001$).

The anxiety level of participants of both evaluated groups is presented in Table 1. The anxiety of patients with TN was significantly higher than healthy control ($P < 0.0001$).

The mean level of anxiety in patients with TN and also in healthy controls did not show a significant difference between men and women ($P > 0.05$), [Table 2].

The mean level of anxiety of men and women in TN group was significantly higher than healthy control women (P: 0.001).

The mean levels of anxiety between different age ranges in patients with TN and healthy controls are presented in Table 3, which were not different in both evaluated groups ($P > 0.05$).

The patients with TN in different ranges of ages had higher level of anxiety than healthy controls ($P < 0.05$) [Table 3].

DISCUSSION

In this study, patients with TN had more prominent levels of anxiety than healthy controls. Furthermore, the mean level of anxiety was higher in both men and women with TN than in healthy men and women. In addition, patients with the age range of 31 up to 60 years old had significantly higher levels of anxiety than healthy controls. On the other hand, in each group, the same level of anxiety was reported for men in comparison to women and also for different age ranges.

Some studies regarding the variation of different types of orofacial pain and headaches are discussed below. In a study, Kambalimath *et al*. reported a positive correlation between myofascial pain dysfunction syndrome (MPDS) and anxiety through higher level of serum cortisol in patients with MPDS than healthy controls.[20] Another evaluation supported the association between temporomandibular dysfunction pain and psychological disorders.[23] In addition, another study confirmed this relation.[3] Goyal *et al*. suggested that the temporomandibular disorder (TMD) group showed a significantly higher cortisol response to experimental stress than the control group. Closer examination of the data revealed that the TMD group was heterogeneous and was composed of a group with hypersecretion of cortisol in response to stress (Hi-SC TMD group) and a group whose cortisol response was not significantly different from the control group (Lo-SC TMD group). The Lo-SC TMD group showed significant negative relationships between cortisol response and self-reported symptoms of both anxiety and depression, plus significantly more use of the Praying or Hoping coping strategy on the Coping Strategies Questionnaire.[15]

In a study, the association between migraine and psychiatric disorders has been reported in both clinical and epidemiological aspects. Hence, the prevalence of psychiatric disorders has been found to be increased among individuals with migraine. Furthermore, the severity of anxiety disorder symptoms was significantly higher in patients with migraine compared to patients without migraine. This study suggests that there is an increased prevalence of migraine headaches among anxiety disorder patients in comparison with the general population.[35]

Higher level of anxiety has been reported in patients with more severe pain due to TMDs.[4,22,30,34] In contrast, some studies did not find a significant association between temporomandibular disease and anxiety.[26,27,33] The higher level of anxiety or more common prevalence of anxiety disorders in patients with migraine and tension-type headache and also combined migraine and tension-type headache have been reported in previous assessments. In accordance with these studies, the patients with TN also had higher level of anxiety. All these chronic orofacial pain and headaches can aggravate anxiety disorders.[28] Furthermore, some studies observed more stress and anxiety disorders in TN patients in comparison with healthy ones.[5,11-13,24,35,37]

Differences in the prevalence of anxiety disorders in women and men are controversial.[1,29] In accordance with this, our findings did not show a significant sex difference in anxiety level in TN patients, similarly.

Anxiety can affect pain perception; therefore, anxiety disorders cause more pain attention in affected patients. These focuses on pain can aggravate pain intensity.[9,16,25]

An emotional physical or psychological response to environmental stimulators is described as anxiety. If this normal reaction becomes chronic, anxiety disorders will arise. Furthermore, anxiety disorders impair daily function and quality of life.[21]

TN is a disabling painful disorder, which can affect the quality of life greatly. The frequency of painful attacks in addition to its severity is directly related to lower quality of life. The frequency and chronicity of headaches and TN attacks can affect the severity of sleep disturbance.[3,32]

Anxiety can affect pain perception; therefore, anxiety disorders cause more pain attention in affected patients. These focuses on pain can aggravate pain intensity.[18]

Some studies reported that treatment of TN patients could alleviate pain and anxiety disorders caused by TN.[7,18,41]

The environmental situations for sleep, anxiety, and psychological disorders in addition to their prescribed medication can affect the prevalence of sleep disorders. Excluding these confounding factors can homogenize the evaluated population. The socioeconomic and cultural evaluation may be important and can affect sleep quality.[3,9,39]

Cross-sectional studies cannot assess the sleep disturbance precisely. Furthermore, long-term evaluations with follow-ups are also helpful. In addition, differences in culture and socioeconomic variables may affect anxiety level and even pain perception. Furthermore, considering a heterogeneous population can eliminate the confounding factors. Furthermore, larger sample size, using other various sleep disorders indexes and more previous anxiety evaluations are suggested for the next studies.

CONCLUSION

Patients with TN had significantly higher level of anxiety than healthy participants.

Acknowledgments

The authors thank the Vice-Chancellor of Shiraz University of Medical Sciences for supporting this research (Grant#20958).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Publication of this article was made possible by the James I. and Carolyn R. Ausman Educational Foundation.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Arcand M, Juster RP, Lupien SJ, Marin MF. Gender roles in relation to symptoms of anxiety and depression among students and workers. Anxiety Stress Coping 2020;33:661-74.
2. Bendtsen L, Zakrzewska JM, Abbott JA, Braschinsky M, Di Stefano G, Donnet A, *et al*. European Academy of Neurology guideline on trigeminal neuralgia. Eur J Neurol 2019;26:831-49.
3. Boardman HF, Thomas E, Millson DS, Croft PR. Psychological, sleep, lifestyle, and comorbid associations with headache. Headache 2005;45:657-69.
4. Bonjardim LR, Lopes-Filho RJ, Amado G, Albuquerque RL, Goncalves SR. Association between symptoms of temporomandibular disorders and gender, morphological occlusion, and psychological factors in a group of university students. Indian J Dent Res 2009;20:190-4.
5. Chang B, Zhu W, Li S. Effects of depression and anxiety on microvascular decompression outcome for trigeminal neuralgia patients. World Neurosurg 2019;128:e556-61.
6. Clarke DM, Currie KC. Depression, anxiety and their relationship with chronic diseases: A review of the epidemiology, risk and treatment evidence. Med J Aust 2009;190:S54-60.
7. Cui WQ, Zhang WW, Chen T, Li Q, Xu F, Mao-Ying QL, *et al*. Tacr3 in the lateral habenula differentially regulates orofacial allodynia and anxiety-like behaviors in a mouse model of trigeminal neuralgia. Acta Neuropathol Commun 2020;8:44.
8. Daroff RB, Fenichel GM, Jankovic J, Mazziotta JC. Neurology in Clinical Practice. Netherlands: Elsevier Health Sciences; 2012.
9. Devor M, Wood I, Sharav Y, Zakrzewska JM. Trigeminal neuralgia during sleep. Pain Pract 2008;8:263-8.
10. Faryabi J, Joolhar M. Treatments' outcomes of patients suffered from trigeminal neuralgia in Kerman, Iran. J Dent (Shiraz) 2014;15:140-6.

11. Gambeta E, Chichorro JG, Zamponi GW. Trigeminal neuralgia: An overview from pathophysiology to pharmacological treatments. Mol Pain 2020;16:1-18.
12. Ge X, Wang L, Pan L, Ye H, Zhu X, Fan S, *et al*. Alteration of the cortical morphology in classical trigeminal neuralgia: Voxel-, deformation-, and surface-based analysis. J Headache Pain 2023;24:17.
13. Genco RJ, Ho AW, Kopman J, Grossi SG, Dunford RG, Tedesco LA. Models to evaluate the role of stress in periodontal disease. Ann Periodontol 1998;3:288-302.
14. Greenberg MS. Ulcerative, vesicular, and bullous lesions. In: Burket's Oral Medicine Diagnosis and Treatment. United States: Lippincott Williams and Wilkins; 2003.
15. Goyal S, Jajoo S, Nagappa G, Rao G. Estimation of relationship between psychosocial stress and periodontal status using serum cortisol level: A clinico-biochemical study. Indian J Dent Res 2011;22:6-9.
16. Hals EK, Stubhaug A. Mental and somatic co-morbidities in chronic orofacial pain conditions: Pain patients in need of multiprofessional team approach. Scand J Pain 2011;2:153-4.
17. Hamilton M. Hamilton anxiety scale. Group 1959;1:10.1037.
18. Jia YZ, Li HT, Zhang GM, Wu HY, Zhang SS, Zhi HW, *et al*. Electroacupuncture alleviates orofacial allodynia and anxiety-like behaviors by regulating synaptic plasticity of the CA1 hippocampal region in a mouse model of trigeminal neuralgia. Front Mol Neurosci 2022;15:979483.
19. Katusic S, Beard CM, Bergstralth E, Kurland LT. Incidence and clinical features of trigeminal neuralgia, Rochester, Minnesota, 1945–1984. Ann Neurol 1990;27:89-95.
20. Kambalimath HV, Dixit UB, Thyagi PS. Salivary cortisol response to psychological stress in children with early childhood caries. Indian J Dent Res 2010;21:231-7.
21. Khoo A, Dent MT, Oei TP. Group cognitive behaviour therapy for military service-related post-traumatic stress disorder: Effectiveness, sustainability and repeatability. Aust N Z J Psychiatry 2011;45:663-72.
22. Luo LY, Lee J, Li KY, Leung YY, Li DT. Psychological outcomes on anxiety and depression after interventions for temporomandibular disorders: A systematic review and meta-analysis. Diagnostics (Basel) 2023;13:653.
23. Marbach JJ, Lund P. Depression, anhedonia and anxiety in temporomandibular joint and other facial pain syndromes. Pain 1981;11:73-84.
24. Melek LN, Devine M, Renton T. The psychosocial impact of orofacial pain in trigeminal neuralgia patients: A systematic review. Int J Oral Maxillofac Surg 2018;47:869-78.
25. Melek LN, Smith JG, Karamat A, Renton T. Comparison of the neuropathic pain symptoms and psychosocial impacts of trigeminal neuralgia and painful posttraumatic trigeminal neuropathy. J Oral Facial Pain Headache 2019;33:77-88.
26. Obermann M. Pain lateralization in trigeminal neuralgia. Anesth Pain Med 2012;2:46-7.
27. Park IH. Pain Related Fear of Movement in Korean Temporomandibular Disorder Patients. South Korea: Seoul National University Graduate School; 2018.
28. Pompili M, Serafini G, Di Cosimo D, Dominici G, Innamorati M, Lester D, *et al*. Psychiatric comorbidity and suicide risk in patients with chronic migraine. Neuropsychiatr Dis Treat 2010;6:81-91.
29. Reisner SL, Katz-Wise SL, Gordon AR, Corliss HL, Austin SB. Social epidemiology of depression and anxiety by gender identity. J Adolesc Health 2016;59:203-8.
30. Restrepo CC, Vásquez LM, Alvarez M, Valencia I. Personality traits and temporomandibular disorders in a group of children with bruxing behaviour. J Oral Rehabil 2008;35:585-93.
31. Sarnvivad P, Bumpenboon A, Chumnanvej S. Retrospective long term outcome following microvascular decompression surgery in Thai patients with trigeminal neuralgia. J Med Assoc Thai 2013;96:801-6.
32. Senaratne R, Van Ameringen M, Mancini C, Patterson B, Bennett M. The prevalence of migraine headaches in an anxiety disorders clinic sample. CNS Neurosci Ther 2010;16:76-82.
33. Seidel S, Hartl T, Weber M, Matterey S, Paul A, Riederer F, *et al*. Quality of sleep, fatigue and daytime sleepiness in migraine--a controlled study. Cephalalgia 2009;29:662-9.
34. Shiau YY, Chang C. An epidemiological study of temporomandibular disorders in university students of Taiwan. Community Dent Oral Epidemiol 1992;20:43-7.
35. Tan CY, Shahrizaila N, Goh KJ. Clinical characteristics, pain, and quality of life experiences of trigeminal neuralgia in a Multi-Ethnic Asian Cohort. J Oral Facial Pain Headache 2017;31:e15-20.
36. von Eckardstein KL, Keil M, Rohde V. Unnecessary dental procedures as a consequence of trigeminal neuralgia. Neurosurg Rev 2015;38:355-60.
37. Wu TH, Hu LY, Lu T, Chen PM, Chen HJ, Shen CC, *et al*. Risk of psychiatric disorders following trigeminal neuralgia: A nationwide population-based retrospective cohort study. J Headache Pain 2015;16:64.
38. Yoshihara T, Shigeta K, Hasegawa H, Ishitani N, Masumoto Y, Yamasaki Y. Neuroendocrine responses to psychological stress in patients with myofascial pain. J Orofac Pain 2005;19:202-8.
39. Zakrzewska JM. Multi-dimensionality of chronic pain of the oral cavity and face. J Headache Pain 2013;14:37.
40. Zakrzewska JM. Diagnosis and differential diagnosis of trigeminal neuralgia. Clin J Pain 2002;18:14-21.
41. Zhuang ZF, Wu HY, Song YY, Li L, Cui X, Yang J, *et al*. N-Methyl D-aspartate receptor subtype 2B/Ca2+/calmodulin-dependent protein kinase II signaling in the lateral habenula regulates orofacial allodynia and anxiety-like behaviors in a mouse model of trigeminal neuralgia. Front Cell Neurosci 2022;16:981190.
42. Zwanzger P. Pharmakotherapie bei Angsterkrankungen. PSYCH up2date 2016;10:135-45.

How to cite this article: Baghaei S, Lavaee F, Roosta A, Amiri D. Evaluation of anxiety disorder in patients with trigeminal neuralgia. Surg Neurol Int 2023;14:266.