



Prevalence of trigeminal neuralgia among dental patients — An institutional study

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ABSTRACT

Trigeminal neuralgia is a chronic condition which produces severe pain involving a part of the face. The aim of this study was to evaluate the prevalence of trigeminal neuralgia among dental patients visiting a dental institution. This retrospective study included patients who were diagnosed with trigeminal neuralgia from July 2019 to March 2020 in a dental hospital. The digital case records of all patients were retrieved and details were recorded, which included the clinical, radiographic examination and treatment undergone by the patients. Variables such as age, gender, site of involvement were also retrieved from the case records. Data were tabulated and statistically analysed using IBM SPSS version 23.0 and results obtained. P value < 0.05 was considered statistically significant. In the present study, out of 28 patients, males (53.6%) were more affected by trigeminal neuralgia than females (46.4%) with a higher prevalence on the right side (57.1%). Quadrant I (25%) and combination of quadrant II and quadrant III (25%) were most commonly involved by this condition. No statistically significant association was found between age and quadrant affected; gender and quadrant affected. (p>0.05). It can be concluded from our study that males were more affected with trigeminal neuralgia, the majority involving the right side of the face and seen commonly among the elderly age group. Dentists must be aware of the clinical features of trigeminal neuralgia for accurate diagnosis and early initiation of prompt treatment to avoid untoward complications.



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INTRODUCTION

Trigeminal neuralgia (TN) is a shock-like neuropathic pain involving the distribution of one or more branches of the fifth cranial nerve, which may be idiopathic in origin or secondary intracranial tumour, infarction and multiple sclerosis. The neuralgic pain is sudden in origin, and the patients feel like an electric shock which lasts for a few seconds to minutes. (Zakrzewska, 2002; Nurmikko and Eldridge, 2001; Scrivani *et al.*, 2005; Yadav *et al.*, 2015)

According to the international headache society,

classical TN is defined as a unilateral severe, short, stabbing and recurrent pain in onset and termination, limited to the divisions of the trigeminal nerve. (Cephalalgia, 2004; Joffroy *et al.*, 2001)

The diagnosis of trigeminal neuralgia (TN) mostly depends on clinical characteristics. Diagnostic criteria must include the variants of clinical phenotype and incorporate the etiology of trigeminal neuralgia. (Nurmikko and Eldridge, 2001) Radiographs of the face and jaws, computed tomography of the brain, magnetic resonance imaging must be done to check for any abnormality. (Cephalalgia, 2004).

Evaluation and treatment of trigeminal neuralgia involve clinicians in various medical fields, including neurology, neuroradiology, neurosurgery, dentistry, maxillofacial surgery, and specialists in pain medicine (Crucchi *et al.*, 2016). TN is not properly diagnosed due to unavailability of clearcut laboratory investigations and many times, patients suffer till a proper diagnosis is made and treatment is initiated. TN can affect the routine life of the patient and over a period of time, it does not respond to any treatment modality. (Yadav *et al.*, 2015)

The incidence of trigeminal neuralgia is about 12.6 in 100000 persons/year and its incidence increases with ages. (Koopman *et al.*, 2009) TN occurs predominantly during 5th to 7th decades of life with a female predilection. It can also occur in children. (Bennetto *et al.*, 2007) The annual incidence for women and men with TN is approximately 5.9 cases in 100000 women and approximately 3.4 cases in 100000 men respectively. (Katusic *et al.*, 1990; Türp and Gobetti, 1996). Trigeminal neuralgia pain originates mostly in patients aged 50 years or older. (Loh *et al.*, 1998; Loeser, 2001; Darlow *et al.*, 1992). In the majority of patients, Trigeminal neuralgia pain is unilateral frequently involving the right side. (Bagheri *et al.*, 2004)

Previously our team had conducted numerous clinical trials (Jesudasan *et al.*, 2015; Christabel, 2016), in vitro studies (Patil *et al.*, 2017; Marimuthu *et al.*, 2018; Jain *et al.*, 2019; Abhinav *et al.*, 2019), awareness studies and reviews (Packiri *et al.*, 2017; Kumar, 2017) over the past ten years. Now we are focussing on epidemiological studies. The idea for this study stemmed from the current interest in our community. (Patturaja and Pradeep, 2016; Kumar and Sneha, 2016; Kumar and Rahman, 2017)

There are various reports of trigeminal neuralgia in several populations. So this study was aimed to evaluate the prevalence of trigeminal neuralgia among patients visiting our dental institution in Chennai. (Rahman and Kumar, 2017; Kumar, 2017; Rao and kumar, 2018; Abhinav, 2019)

MATERIALS AND METHODS

Study design and study setting

This retrospective cross-sectional study was conducted to evaluate the prevalence of trigeminal neuralgia in dental patients who visited Saveetha dental college and hospital, Saveetha University, Chennai, India, from June 2019 to March 2020. The study was initiated after approval from the institutional review board. Ethical approval number was SDC/SIHEC/2020/DIASDATA/0619-0320.

Sampling

After thorough assessment in the university patient data registry, case records of all 28 patients who were diagnosed with trigeminal neuralgia were included in the study. The exclusion criteria were missing or incomplete data. Cross verification of data for errors was done with the help of an external examiner.

Data Collection

A single calibrated examiner evaluated the digital case records of the patients who were diagnosed with trigeminal neuralgia from June 2019 to March 2020. Relevant clinical features, including side of face involved and quadrant affected by trigeminal neuralgia, were analysed and retrieved. Demographic details like age, gender were also recorded.

Statistical Analysis

The collected data was validated, tabulated and analysed with Statistical Package for Social Sciences for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. Chi-square test was used to test associations between categorical variables. P value < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

In the present study, the prevalence of trigeminal neuralgia was more in the 61-70 years age group (28.6%) followed by the 41-50 years and 51-60 years age group (25%) and the least prevalence was found among 21-30 years age group (3.571%) [Figure 1]. Males (53.6%) had a higher prevalence of trigeminal neuralgia than females (46.4%) [Figure 2]. The right side of the face (57.1%) was affected more with trigeminal neuralgia compared to the left side of the face (42.9%) [Figures 3 and 4]. The quadrant I and combination of quadrant II and quadrant III had an equal prevalence of trigeminal neuralgia (TN) with 25%. The least prevalence

of trigeminal neuralgia was found in quadrant II (3.571%).

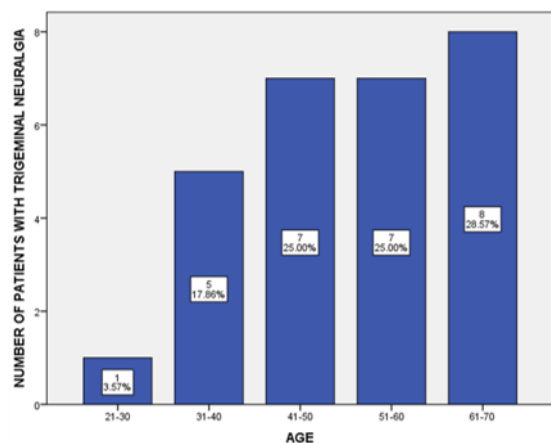


Figure 1: Bar graph shows the age distribution of patients with trigeminal neuralgia

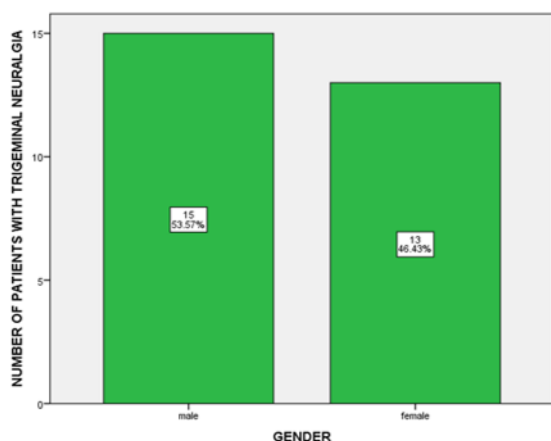


Figure 2: Bar graph shows the gender-wise distribution of patients with trigeminal neuralgia

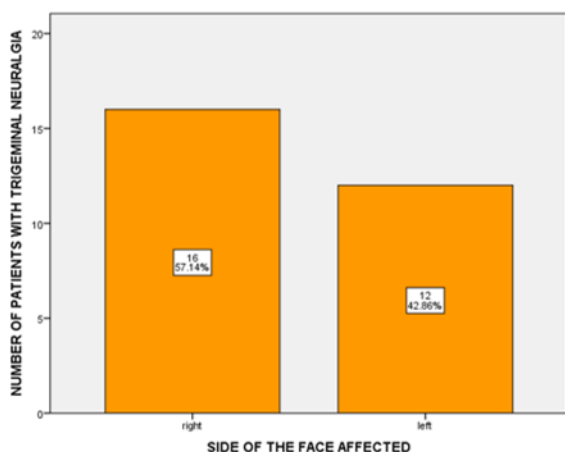


Figure 3: Bar graph shows the distribution of side of facial involvement of trigeminal neuralgia

The right side was affected with a higher prevalence among 61-70 years age group (8.75%) and the left

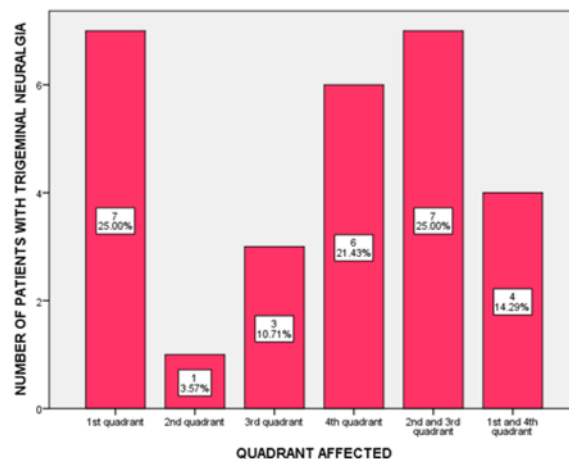


Figure 4: Bar graph shows the distribution of trigeminal neuralgia among different quadrants

side was affected with higher prevalence among the 41-50 years age group (11.6%) and the results were statistically insignificant ($p < 0.374$) [Figure 5].

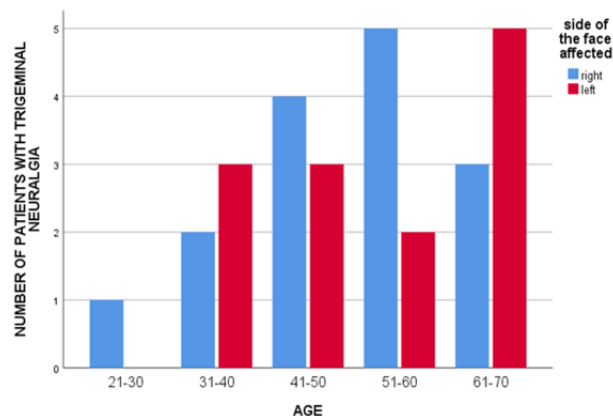


Figure 5: Bar graph depicting the association between age and the face's side affected trigeminal neuralgia patients

On analysing the quadrant involved in different age groups, among 21-30 years, higher prevalence of trigeminal neuralgia was seen in quadrant I (3.57%). Among 31-40 years, higher prevalence of trigeminal neuralgia was found in quadrant I (7.14) and quadrant IV (7.14). Among 41-50 years, higher prevalence of trigeminal neuralgia was in combination with quadrant II and III (10.71%). Among 51-60 years, higher prevalence of trigeminal neuralgia was seen in quadrant IV (10.71%). Among 61-70 years, higher prevalence of trigeminal neuralgia was seen in combination of both quadrant I and IV (10.71%) and quadrant II and quadrant III. (10.71%), but the results were statistically insignificant ($p < 0.427$) [Figure 6].

On assessing the side of the face most commonly involved, males had a prevalence of 28.57% of the right side and 25% of the left side. Females had a

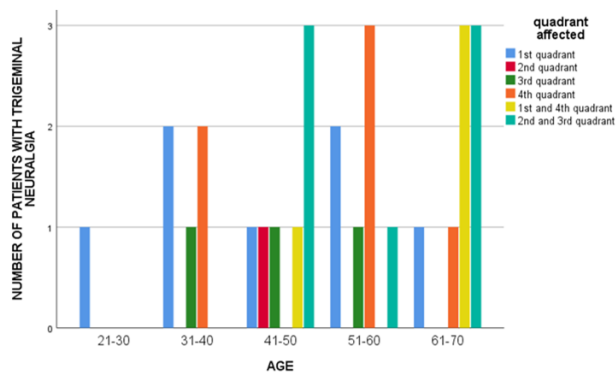


Figure 6: Bar graph depicting the association between age and the quadrant affected in trigeminal neuralgia patients.

prevalence of 28.57% of the right side and 17.86% of the left side. The right side was more affected among males (50%) and females (50%) and the results were statistically insignificant. ($p < 0.662$) [Figure 7].

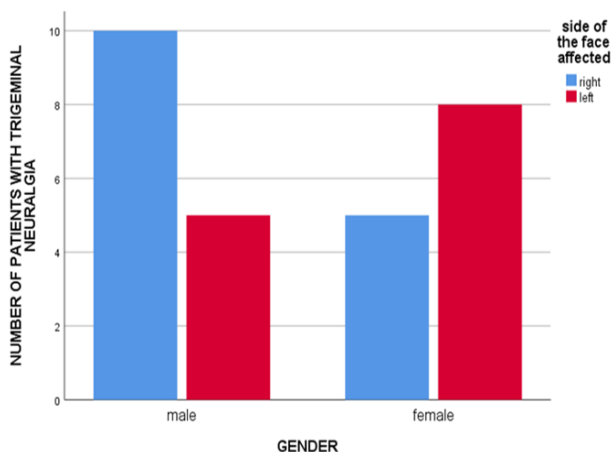


Figure 7: Bar graph showing association between gender and side of the face affected in trigeminal neuralgia patients

Among males the distribution of trigeminal neuralgia among different quadrants was quadrant I (10.71%), quadrant III (7.14%), quadrant IV (17.86%) and combination of quadrant II and III (14.29%); quadrant I and IV (3.57%). Among females, the distribution of trigeminal neuralgia was quadrant I (14.29%), quadrant II (3.57%), quadrant III (3.57%), quadrant IV (3.57%) and combination of quadrant II and III (10.71%); quadrant I and IV (10.71%) The most commonly affected quadrant was found to be IVth quadrant in males (17.89%) and Ist quadrant in females (14.29%) but the results were statistically insignificant. $P < 0.396$ [Figure 8].

In our study, out of 28 subjects, males were more affected than females. The study showed a higher prevalence of trigeminal neuralgia among males with a mean age of 55.5 years. The most affected

side was found to be right among both males and females. The quadrant I was more affected, followed by a combination of quadrant II and III.

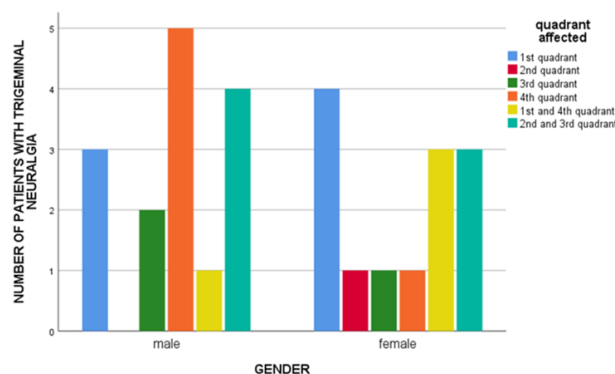


Figure 8: Bar graph showing association between gender and quadrants affected in trigeminal neuralgia patients

Figure 1, X-axis — age in years; Y-axis — number of patients with trigeminal neuralgia. The higher prevalence of trigeminal neuralgia was among 61-70 years of age (28.57%) and the least prevalence was among 21-30 years, age groups. (3.571%). Figure 2, X-axis — gender(male/female); Y axis - number of patients with trigeminal neuralgia. There was a higher prevalence of trigeminal neuralgia among males (53.57%) than females (46.43%). Figure 3, X-axis — side of the face; Y-axis — number of patients with trigeminal neuralgia there was a higher prevalence on the right side of the face (57.14%) than left (42.86%). Figure 4, X-axis — quadrants; Y-axis — number of patients with trigeminal neuralgia. There was a higher prevalence in quadrant I (25%), quadrant II and III (25%) and the least prevalence was seen in quadrant II (3.571%). Figure 5, X-axis - age in years; Y-axis - number of patients with trigeminal neuralgia. The higher prevalence of trigeminal neuralgia on the right side of the face (blue) was among 61-70 years (17.86%) and on the left side of the face (red) was among 41-50 years (17.86%). Pearson chi square value - 3.001^a; p-value - 0.558 ($p > 0.05$), statistically not significant. Association between age and the side of facial involvement was not established. Figure 6, X-axis- age in years; Y-axis - number of patients with trigeminal neuralgia. The higher prevalence of trigeminal neuralgia was found in quadrant II and III(light green) among 41-50 years(10.71%), in quadrant IV(orange) among 51-60 years (10.71%), in quadrant II and III(light green); quadrant I and IV(yellow) among 61-70 years (10.71%). Pearson chi square value - 20.496^a; p-value - 0.427 ($p > 0.05$), statistically not significant. Figure 7, X-axis - gender (males/females). Y-axis - number of patients with trigeminal neural-

gia. Among the males, higher prevalence of trigeminal neuralgia was seen involving the right side of the face (blue) (28.57%). Among females, a higher prevalence of trigeminal neuralgia was seen involving the left side of the face (red) (28.57%). Pearson chi square value - 2.227^a; p-value - 0.136 (p>0.05), statistically not significant. Figure 8, X-axis - gender (males/females). Y-axis - number of patients with trigeminal neuralgia. Among the males, higher prevalence of trigeminal neuralgia was seen in quadrant IV (orange) (17.86%). Among females, a higher prevalence of trigeminal neuralgia was seen in quadrant I (blue) (14.29%). Pearson chi square value - 5.196^a; p-value - 0.396 (p>0.05), statistically not significant.

In our study, there was a male predominance, which is in accordance with several other studies. (Kalyanaraman and Ramamurthi, 1970). In a study, males and females were equally affected by trigeminal neuralgia. (Green and Selman, 1991) Our study results were in accordance to the study by Arpita rai et al., which had a male predilection (Rai et al., 2017). Our study results were contradicted by several studies which had a female predilection. (Katheriya et al., 2019; Siqueira et al., 2009)

In our study, the most affected side with trigeminal neuralgia was right. Literature has shown that patients experience severe pain on the right side (64%) compared to the left side (36%) with the ratio of males to females, suffering from TN, as 1:2. According to Rabinovich et al. (2000) and Neto et al. (2005) the right side of the face was more commonly affected than the left (ratio of 1.5:1) and it could be due to narrower foramen rotundum and foramen ovale on the right side. Our study results are similar to those of several other studies (Loh et al., 1998; Katheriya et al., 2019; Siqueira et al., 2009). A study demonstrated that trigeminal neuralgia affected equally on both sides of the face (Rai et al., 2017).

In our study, the most prevalent age group of trigeminal neuralgia was 61-70 years, similar to that reported in various literature as 5th-8th decades of life (Kalyanaraman and Ramamurthi, 1970; Katusic et al., 1990). According to studies, symptomatic TN is common in the younger age group. There is no clear cut demarcation between the age range of patients with classical TN and symptomatic TN. (Sato, 2004; De Simone et al., 2005) In our study, the peak age of TN was between the 5th and the 6th decades of life. Many studies agreed with our study results that the most affected age group with trigeminal neuralgia was 55-64 years. (Loh et al., 1998; Rai et al., 2017; Katheriya et al., 2019)

In our study, the most commonly affected quadrant was quadrant I and combination of quadrant II and III. Our study results were in accordance with many studies that showed maxilla and mandible were affected with maxilla being most commonly affected by trigeminal neuralgia. Some studies suggested that the mandibular arch was more affected, which is contradictory to the results of our study. (Bagheri et al., 2004; Rai et al., 2017; Katheriya et al., 2019)

The limitations of the present study would be the sample size which was not generalized with the entire population. Thus, multicentric study with large sample size with assessment of branch of the nerve affected and the treatment modality can be implemented in the future.

CONCLUSIONS

It can be concluded from our study that males were more affected with trigeminal neuralgia, the majority involving the right side of the face and seen commonly among the 61-70 years age group. Dentists must be aware of the clinical features of trigeminal neuralgia for accurate diagnosis and early initiation of prompt treatment to avoid untoward complications.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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