



Prevalence of trigeminal neuralgia patients in the community: A retrospective study

Prevalence of trigeminal neuralgia

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Abstract

Aim: The aim of this study is to evaluate the prevalence of trigeminal neuralgia (TN) in Adiyaman and its surrounding populations. **Material and Method:** The study population consisted of 154.969 patients admitted to the Adiyaman University, Department of Oral and Maxillofacial Surgery between 2015 and 2018. Clinical records of 41 patients diagnosed with TN were retrospectively reviewed. Demographic data and clinical characteristics of the patients were recorded. Localization, age and sex distribution and the prevalence of TN were determined. **Results:** Among the 41 cases with TN, 27 were female and 14 were male. The mean age of the patients was 58.59 ± 16.38 years. Thirty-nine patients (95.1%) had unilateral and 2 patients (4.9%) had bilateral TN. While the mandibular branch (V3) involvement of the trigeminal nerve was observed in 16 patients, 5 patients showed maxillary branch (V2) involvement, and 3 patients exhibited ophthalmic branch (V1) involvement. In addition, V1+V2 involvement was observed in 1 patient, V2+V3 involvement was observed in 5 patients and V1+V2+V3 involvement was described in 11 patients. Overall, the prevalence of TN was found to be approximately 0.03% (26/100.000). **Discussion:** TN is a rare disease, estimation of its prevalence is difficult, hence, the literature on the prevalence and of TN is limited. The prevalence rate is about 4.5-29.5 per 100.000 individuals in other studies. The present study revealed that the prevalence of TN in Adiyaman and its surroundings was 26/100.000. This study may be the first one in Turkey to investigate the prevalence of TN.

Keywords

Trigeminal Neuralgia; Prevalence; Epidemiology

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Introduction

Trigeminal neuralgia (TN) is a disease characterized by frequent unilateral, sudden and paroxysmal pain attacks affecting the orofacial region, often described as “the worst pain in the world” by patients [1]. TN affects one or more branches of the trigeminal nerve, often the second or third branches [2]. The trigger factors for TN attacks include washing the facial area, shaving, smoking, speaking, brushing teeth or exposure to cold [3]. The pain caused by these attacks usually ends within a few seconds, but in some cases, it has been reported to last for up to 2 minutes [4].

The etiology of TN may be idiopathic or symptomatic. Symptomatic TN cases are thought to be secondary to diseases such as tumors, cardiovascular infarction, and multiple sclerosis. On the other hand, the causes of idiopathic TN are not fully understood. It is postulated that demyelination along the trigeminal nerve causes pain, which is presumed to occur due to the neurovascular interaction between the trigeminal nerve and an abnormal venous or arterial vascular structure [5].

While TN is treated by various specialists, including oral and maxillofacial surgeons, there is no consensus on the modality of treatment for TN. The treatment is often delayed due to misdiagnosis, in addition to the complexity of treatment for this condition. When diagnosed, the initial medical treatment, which is performed through the use of carbamazepine, oxcarbazepine, baclofen, gabapentin, phenytoin, clonazepam, lamotrigine, valproic acid or topiramate, may be followed by conducting rhizotomy, microvascular decompression or Gamma-Knife [6-8]. TN is rare; therefore, it is difficult to obtain high-quality epidemiological data [9]. TN can occur at any age, but more than 90% of the cases are observed after 40 years of age. It is observed more frequently in women than in men [4, 10]. In addition, TN may occur in conjunction with some diseases, which is why individuals with multiple sclerosis and hypertension have a higher risk of TN [11].

Although there is no consensus on the prevalence and incidence of TN in the literature, several studies have investigated this subject in various regions of the world [2,3,12-15]. In these studies, the prevalence of TN in the population was reported to range between 0.7-27/100.000. To the best of author’s knowledge, there are no studies reporting the prevalence of TN in Turkey. Thus, the aim of this study was to determine the prevalence of TN in Adiyaman and its surrounding populations.

Material and Method

This retrospective study was approved by Adiyaman University, Ethics Committee for Non-Interventional Research (2018/3-3). The data of 154.969 patients, who were admitted to the Oral and Maxillofacial Surgery Clinic of Adiyaman University between 2015 and 2018 due to various dental and orofacial problems, were examined. These patients were either admitted directly to Adiyaman University, Oral and Maxillofacial Surgery clinic and were diagnosed with TN or were referred to Oral and Maxillofacial Surgery clinic after they were diagnosed with TN at the Faculty of Medicine Training and Research Hospital. The demographic information (age and sex) of the patients and the clinical characteristics of TN (affected side of the face, which branches of the trigeminal nerve were affected) were recorded.

By using these data, the frequency, localization, age, and distribution of TN in Adiyaman and its surroundings were determined.

Results

Of the 154.969 patients who applied to oral and maxillofacial surgery clinic, 41 had TN, thus the prevalence of TN was ~0.03% (26/100.000). Among these 41 patients, 27 (66%) were female and 14 (34%) were male. The mean age was 56 ± 18.14 years for women and 63.57 ± 10.66 years for men. Table 1 shows the demographic characteristics of the TN patients. Thirty-nine (95.1%) patients were unilaterally affected while 2 (4.9%) patients were affected bilaterally. Of the total of 39 unilateral cases, 15 patients were found to have neuralgic pain on the left side and 24 of them had pain on the right side (Table 2). While a single branch of the trigeminal nerve was involved in 24 of the 41 patients (58.5%), 17 patients (41.5%) exhibited involvement of multiple branches of the trigeminal nerve. The mandibular branch (V3) involvement of the trigeminal nerve was observed in 16 patients, maxillary branch (V2) involvement in 5 patients, ophthalmic branch (V1) involvement in 3 patients, V1 + V2 involvement in 1 patient, V2 + V3 involvement in 5 patients and V1 + V2 + V3 involvement was identified in 11 patients (Table 3).

Table 1. Demographic characteristics of patients with trigeminal neuralgia

Trigeminal Neuralgia	N	Age ± Sd.
Female	27 (66%)	56 ± 18.14
Male	14 (34%)	63.57 ± 10.66
Total	41 (100%)	58.59 ± 16.38
	Population size	Prevalence
	154,969	26/100,000

Sd:Standard deviation

Table 2. The distribution of trigeminal neuralgia

Involvement	N
UNILATERAL Right	24 (58.5%)
UNILATERAL Left	15 (36.6%)
BILATERAL	2 (4.9%)

Table 3. The distribution of trigeminal neuralgia with respect to the affected branches of the trigeminal nerve

Branches	Single n:24 (58.5%)	Multiple n:17 (41.5%)	%
Mandibular (Man) (V1)	16		39%
Maxillary (Max) (V2)	5		12.2%
Ophthalmic (Opt) (V3)	3		7.3%
Man + Max (V1+V2)		5	12.2%
Max + Opt (V2+V3)		1	2.4%
Man +Max + Opt (V1+V2+V3)		11	26.9%

Discussion

Because TN is a rare disease, estimation of its prevalence is difficult, hence, the literature on the prevalence and incidence

of TN is limited [2, 9]. The average prevalence rate is about 4.5 per 100.000 individuals [16,17]. MacDonald and colleagues [12] reported the annual incidence of TN to be 8/10.000 and the annual lifetime prevalence of TN to be 0.07%. TN prevalence was calculated to be 0.02% (15/100.000) by Sindou et al. [13] in Rochester, Minnesota, 0.3% (10/3336) by Mueller et al. [2] in Germany and 0.03% (29.5/100.000) by El-Tallawy et al. [3] in Egypt. In the present study, the prevalence of TN in Adiyaman and its surrounding population was found to be 0.03% (26/100.000).

TN can be observed at all ages but is more common in the elderly population, especially in the 50-70 years of age range. Katusic et al. [15] reported the incidence of TN as 25.9/100.000 among individuals over 80 years of age. In a retrospective study with 92 patients diagnosed with TN, the mean age of the patients was reported to be 67.3 ± 12.7 [6]. In the present study, there was no age limit and the mean age of the patients (58.59 ± 16.38), which was in the 5th decade, was found to be lower than in the other studies (minimum age: 29-maximum age: 89). In the present study, 66% of the TN patients were female, while in a previous study, 55-70% of TN patients were female and 45% of the patients had maxillary pain [6]. In a retrospective study by Rothman and Monson [18] using data on patients in the Massachusetts General Hospital, the ratio of women with TN was reported to be 1.17-fold higher compared to men. Jainkittivong et al. [19] reported that 62.8% of the TN cases were observed in women. In studies by Bangash [20] and Loh et al. [21], the ratio of women with TN to men was found to be 2/1 and 1.75/1, respectively. Thus, the male to female ratio in the present study is consistent with the findings of previous studies [6, 20, 21]. However, it should be noted that, contrary to these studies, three separate studies in India reported that TN was more prevalent in males [22-24].

In the current study, 95.1% of TN patients were affected unilaterally and 61% of the patients with unilateral involvement were affected on the right side (right/left ratio: 1.6). A retrospective study by Ibrahim and colleagues [6] has previously reported that 98% of TN patients had unilateral and 2% had bilateral involvement in a cohort of 92 patients. In the same study, 56% of patients with unilateral involvement were found to be affected on the right side. Jainkittivong et al. [19] showed bilateral involvement in only two patients while unilateral involvement was observed in 98.9% of 188 TN patients. In addition, in this study, it was reported that the right side of the face was affected 1.8 times more than the left side. Loh et al. [21] reported that the right side was 1.4 times more affected than the left side in unilateral involvement cases. The results of the current study are in line with those of previous studies [6, 19, 21]. The reason for the right side being affected more than the left side is thought to be caused by the narrowness of the foramen ovale and foramen rotunda compared to those on the left side [25].

The causes of the degree of nerve branch involvement in TN are not known [20]. Previous studies have shown that the most commonly affected nerve in TN is the mandibular branch (V3) and that the ophthalmic branch (V1) is less affected [12, 14, 15, 19-21]. On the other hand, a limited number of studies have suggested that the maxillary branch was the most widely affected nerve in TN [2, 6]. Katusic et al. [15] suggested that the

maxillary and mandibular branches were affected equally and the ophthalmic nerve was less affected than the other branches. In the current study, the most affected branch was found to be the mandibular branch (V3), consistent with the findings of the majority of the previous studies. It was also found that about 26% of the patients had all three branches of the trigeminal nerve (V1 + V2 + V3) affected and 12% of the patients had the second and third branches (V2 + V3) affected together.

Conclusion

TN is a rare disease and it is difficult to diagnose. The present study showed the prevalence of TN in Adiyaman and its vicinity to be 26/100.000. This is the first study investigating the prevalence of TN in Turkey and the authors believe that this study's results form a basis for understanding the TN prevalence in the general population in Turkey. On the other hand, more community-based and multicenter studies are needed to confirm and elucidate this study's results.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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