

# Prevalence of Trigeminal Neuralgia in Patients Visiting Dental OPD of a Dental College in Kanpur: A Demographic Study

## Abstract:

**Aims and objectives:** Tic douloureux is another name for trigeminal neuralgia (TN). The first report of TN can be found in the writing of Avicenna in the 11th century, but John Fothergill gave the modern description of TN in his paper on the subject in 1773. The present study was conducted to evaluate the prevalence of Trigeminal Neuralgia (TGN) among north Indian population.

**Materials and methods:** A cross-sectional descriptive study on the prevalence of Trigeminal neuralgia was conducted in the outpatient department of Oral Medicine and Radiology during a period of 5 years (1 January 2015 to 31 December 2019). All selected patients over the age of 18 were asked for their TN history using a structured questionnaire based on diagnostic criteria of trigeminal neuralgia according to the beta-version of the 3rd edition of the International Classification of Headache Disorders (ICHD3-beta) after acquiring their personal data (name, age, gender and address). Descriptive statistics included calculation of means and percentages. Data distribution was assessed for normality using Shapiro-Wilk test to check whether a sample came from a normally distributed population or not. The chi-square test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. Student's t-test was used to test the means between the samples. All values were considered statistically significant for a value of  $p < 0.05$ .

**Results:** Out of 1500 patients, 26.67% were male and 73.33% were female. The peak incidence was in the age range of 60-70 years. Maxillary nerve (71.1%) was most commonly involved followed by mandibular (20.2%) and ophthalmic (8.7%) nerve. The right side of the face (80%) was more involved than the left side (20%) of the face. The majority of patients described their attack as a shock like and of spontaneous onset.

**Conclusion:** TN is often misdiagnosed as toothache, resulting in root canal therapy and tooth extractions. To recognize and manage this problem, an interprofessional strategy involving the primary care physician, dentist, neurologist, anesthesiologist, and neurosurgeon is required. Correct diagnosis and management can benefit patients and result in a good prognosis.

**Key-words:** Tic douloureux, pain, lancinating pain, orofacial pain.

## Introduction:

Tic douloureux is another name for trigeminal neuralgia (TN). The first report of TN can be found in the writing of Avicenna in the 11th century, but John Fothergill gave the modern description of TN in his paper on the subject in 1773.[1]

According to the beta version of the 3rd edition of the International Classification of Headache Disorders (ICHD-3 Beta), trigeminal neuralgia (TN) is defined by recurrent unilateral brief electric shock-like pain that is abrupt in onset and termination.[2] Trigeminal neuralgia (TN) is an episodic

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chronic pain syndrome that affects about 4.5 out of 100,000 people. It is most common in middle-aged and elderly people.[3]

The third edition of the ICHD-3 divides TN into three categories: classical, secondary, and idiopathic. Classical trigeminal neuralgia (CTN) causes pain along the TN distribution for no apparent reason other than neurovascular compression. CTN is characterized by recurring paroxysms of unilateral facial pain with pain-free periods or concomitant background facial pain. Secondary TN is caused by a variety of conditions such as multiple sclerosis (MS), space-occupying lesions, and neuropathy (STN). Patients may have unilateral facial pain in paroxysmal fashion and may have background continuous or near continuous pain. Idiopathic TN is a disorder that has the characteristic symptoms of TN but no substantial abnormalities on electrophysiological tests or radiological examinations. TN is a rare nerve disorder having limited statistical data. The annual incidence of TN was estimated to be 12.6 per 100,000 people per year, and it increased with age.[5] Between 1992 and 2002, a survey of GPs in the United Kingdom found that the incidence of TN was 26 per 100,000 per year.[4,5]

Due to the lack of a definite physical or laboratory diagnosis, TN is frequently misdiagnosed, and patients frequently seek the advice of multiple specialists before receiving a verified diagnosis. Primary health care practitioners are often the first clinicians to encounter patients with trigeminal neuralgia (TN). Hence, role of primary healthcare physician, being the first point of contact for general population, becomes paramount. The present study was conducted to evaluate the prevalence of Trigeminal Neuralgia (TGN) among North Indian population.

### Materials and Methods:

A cross-sectional descriptive study on the prevalence of Trigeminal neuralgia was conducted in the outpatient department of Oral Medicine and Radiology during a period of 5 years (1 January 2015 to 31 December 2019). A total of 80320 patients were screened. Approval from the Ethical Committee of the Institute was obtained and written informed consent was obtained from the participants. The inclusion criteria involved typical TN cases without any organic/primary etiology; however, the exclusion criteria involved brain tumors, any neurosurgical history, and trauma. All selected patients over the age of 18 were asked for their

TN history using a structured questionnaire based on diagnostic criteria of trigeminal neuralgia according to the beta-version of the 3rd edition of the International Classification of Headache Disorders (ICHD3-beta) after acquiring their personal data (name, age, gender and address). Onset of pain as acute spontaneous onset or correlation with dental treatment or disease was also recorded. The frequency of episodes, duration of each episode, and duration of the refractory period, as well as inciting, relieving, and related factors, were all evaluated for periodicity of pain. A standardized head and neck examination was performed by qualified oral medicine specialists to determine trigger sites, as well as sensory tests in the trigeminal nerve distribution. To rule out all suspected dental and bone disorders, necessary radiographic investigations were performed. Identification of the involved nerve branch has been done in accordance to the site of pain and confirmed by a diagnostic nerve block where a local anesthetic 2% lignocaine with adrenaline 1:200,000 injection at the identified site was given. Data was analysed using IBM SPSS Statistics- version 21 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) Descriptive statistics included calculation of means and percentages. Data distribution was assessed for Normality using Shapiro-Wilk test to check whether a sample came from a normally distributed population or not. The chi-square test was used to determine whether there was a significant difference between the expected frequencies and the observed frequencies in one or more categories. Student's t-test was used to test the means between the samples. All values were considered statistically significant for a value of  $p < 0.05$ .

### Results:

There were 80320 subjects in total being screened up, 1500 subjects were found to be suffering from Trigeminal neuralgia. Out of 1500 subjects, 400 were males (26.67%) and 1100 were females (73.33%).(Figure 1).

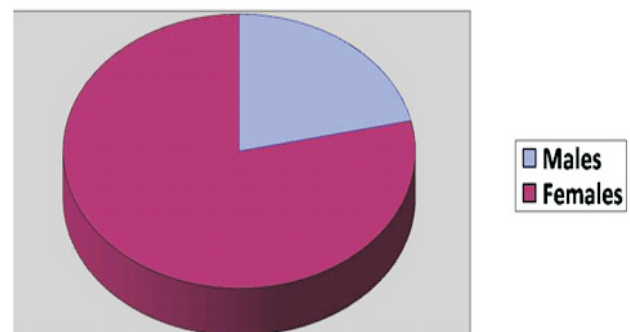


Figure: 1 Gender wise distribution of participants

Table 1 shows the distribution of the study participants according to their gender and age. Out of 400 males 55 (3.7%) were in age group of 40-50 years, 70 (4.7%) were in age group of 50-60 years, 190 (12.7%) were in age group of 60-70 years and 85 (5.6%) males were in age group of 70-80 years. Out of 1100 females 20(1.3%) were in age group of 40-50 years, 430(28.7%) were in age group of 50-60 years, 590 (39.3%) were in age group of 60-70 years and 60(4%) females were in age group of 70-80 years.

S.no	Age Distribution	Males		Females		Total n-1500	
		n	%	n	%	n	%
1.	40-50 years	55	3.7	20	1.3	75	100
2.	50-60 years	70	4.7	430	28.7	500	100
3.	60-70 years	190	12.7	590	39.3	780	100
4.	70-80 years	85	5.6	60	4.0	145	100

Table: 1 Gender and age distribution of study participants

Table 2 shows the clinical characteristics and gender of the patient. With respect to division of trigeminal nerve involved, it was found that maxillary (V2) [71.1%] was most commonly involved followed by mandibular (V3) [20.2%] division and ophthalmic (8.7%). The maxillary nerve was involved in 19.1% of males and 52% of females, mandibular nerve was involved in 7.5% of males and 12.7% of females and ophthalmic nerve was involved in 8.7% of females. The results were found to be statistically significant (P<0.001). The right side of the face (80%) was more involved than the left side (20%) of the face of study population. However, the difference was not statistically significant (P=0.008).

The character or quality of pain analyzed by McGill's pain questionnaire showed that 343 (22.9%) males and 1020 (68%) females experienced electric shock like pain. While 35 (2.3) males and 55 (3.5%) females felt burning, lancinating type of pain. Only 22 (1.5%) males and 27 (1.8%) females experienced throbbing type of pain. The results showed a highly significant difference among the groups (P=0.004).

Pain was classified into two categories: acute spontaneous onset and pain associated with dental therapy or disease. It was observed that 392 (26.1%) males and 1088 (72.5%)

females had acute spontaneous onset of pain. While only 8 (0.5%) males and 12 (0.8%) females had onset of pain correlated with dental treatment or disease. However, the difference was not statistically significant (P=0.197).

Clinical Characteristics		Males	Females	Total	p-value
		(n)%	(n)%		
Nerve Involvement	Maxillary	287 (19.1)	780 (52)	1500	<0.001*
	Mandibular	113 (7.5)	190 (12.7)		
	Ophthalmic	0 (0)	130 (8.7)		
Site Involvement	Right	370 (24.7)	830 (55.3)	1500	0.008
	Left	30 (2)	270 (18)		
Character of pain (McGill's pain questionnaire)	Burning/Lancinating	35 (2.3)	55 (3.5)	1500	0.004*
	Electric Shock Like	343 (22.9)	1020 (68)		
	Throbbing	22 (1.5)	27 (1.8)		
Onset of Pain	Acute/Spontaneous	392 (26.1)	1088 (72.5)	1500	0.197
	Correlated with Dental Treatment	8 (0.5)	12 (0.8)		

\*P<0.05 significant

Table: 2 Clinical characteristics and gender of study participants.

Table 3 shows correlation between clinical characteristics and age of the patient. Maxillary and mandibular nerve was most commonly involved in 60-70 and 50-60 years age group patients respectively. The results were found to be statistically significant (P<0.001).

According to age distribution it was found that right side was more affected in 50-60 and 60-70 years age group patients. Similarly, left side was more commonly affected in 50-60 and 60-70 years age group patients. The results showed a no significant difference among the groups (P=0.212).

On the basis of age distribution, it was found that all age group patients mostly had electric shock like pain. The results were found to be statistically significant (P<0.001).

Study participants of all ages mostly felt acute spontaneous onset of pain and maximum patients were in 50-60 and 60-70 years age group. The results were not statistically significant (P=0.009).

Clinical Characteristics		Age Range				Total	p-value
		40-50 years	50-60 years	60-70 years	70-80 years		
		n(%)	n(%)	n(%)	n(%)		
Nerve Involvement	Maxillary	54 (3.6)	330 (22)	580 (38.7)	103 (6.9)	1500	<0.001*
	Mandibular	21 (1.4)	136 (9.1)	128 (8.5)	18 (1.2)		
	Ophthalmic	0 (0)	34 (2.3)	72 (4.8)	24 (1.6)		
Site Involvement	Right	54 (3.6)	425 (28.3)	590 (39.3)	110 (7.3)	1500	0.212
	Left	21 (1.4)	75 (5)	190 (12.7)	35 (2.3)		
Character of pain (McGill's pain questionnaire)	Burning/Lancinating	17 (1.1)	25 (1.7)	26 (1.7)	20 (1.3)	1500	<0.001*
	Electric Shock Like	50 (3.3)	460 (30.7)	737 (49.1)	116 (7.7)		
	Throbbing	8 (0.5)	15 (1)	17 (1.1)	9 (0.6)		
Onset of Pain	Acute/Spontaneous	75 (5)	494 (32.9)	771 (51.4)	140 (9.3)	1500	0.009
	Correlated with Dental Treatment	0 (0)	6 (0.4)	9 (0.6)	5 (0.3)		

\*P<0.05 significant

Table: 3 Clinical characteristics and age of study participants

**Discussion:**

One of the most prevalent complaints in the orofacial region is pain. Trigeminal neuralgia is one such pain that has an impact on the patient's quality of life.[6]

Siqueira SR assessed the clinical characteristics of patients with trigeminal neuralgia referred to neurosurgery in a center of reference. In the first study, the higher prevalence was found in women with mean age of 62.5 years. In second study, the higher prevalence was found in women with mean age of 60.8 years.[7]

Similar to the observations also seen in the study conducted by Maarbjerg S et al, Jainkittivong A and Thomas R which showed that TN is more common in the elderly and mostly affects patients between of 50 and 70 years of age and had high prevalence in women.[8,9,10] A similar pattern was also observed in present study with the peak age of onset between the 5<sup>th</sup> and the 7<sup>th</sup> decades of life and TN was more prevalent in female patients, which can be due to a longer life expectation of women and TN is more common in the elderly.

With respect to division of trigeminal nerve involved, it was found that maxillary (V2) was most commonly involved followed by mandibular (V3) division. These results of present study are consistent with findings of Katusic et al., Barker et al., and Dia Tine et al. who showed that the most affected branch was the maxillary division (V2).[11,12,13] However findings of Jainkittivong et al. and Loh et al. showed

that the mandibular division (V3) of the trigeminal nerve was the most frequently involved branch.[9,14]

The findings of study done by Sunitha KC, Siqueira SR, Maarbjerg S, Jainkittivong A, Katusic S, Neto HS, showed that the right side of the face was affected more frequently than the left side.[6,7,8,9,11] The results of present study are consistent with all these investigators. This could be because of that fact that the foramen rotundum and foramen ovale are narrower on the right side. The maxillary and mandibular nerves cross through the foramen's rotundum and ovale, respectively and these are the nerves mostly affected in TN reported by Neto et al., and Rabinovich et al.[15,16]

Tic douloureux (TN) is still dependent on subjective symptoms such as sudden sharp lancinating/ shooting or stabbing pain, mostly unilateral along the course of the nerve. It is characterized as solitary paroxysms interspersed by pain free intervals. Generally, patient with atypical or such facial pain could not elicit exact nature of the pain. In such case some symptoms are suggested by the clinician to actually reach a clinical diagnosis. The other tool to differentiate between neuralgic pain and other facial pain is the use of the McGill's pain questionnaire. With respect to type or quality of pain as determined by McGill's pain questionnaire, revealed that the majority of the patients experienced electric shock like pain.

The observation of present study was similar to study conducted by Thomas R and Rai A et al.[10,17] However Maarbjerg S et al reported stabbing type of pain and Jainkittivong A et al. reported sharp pain in their study.[8,9]

The pain associated with TN is sometimes misattributed to a dental origin. Therefore, extreme caution should be taken in cases where TN is initially experienced as episodic toothache. Dentists can easily rule out odontogenic pain because odontalgia can be relieved with local anaesthetic agents.<sup>17</sup> In the current study the onset of pain was classified into two categories: acute spontaneous onset and correlation with dental therapy or disease. The observation of present study revealed that maximum felt acute spontaneous onset of pain as compared to those, whose onset of pain correlated with dental treatment or disease. The findings of study done by Zakrzewska and Loeser showed that pain was triggered spontaneously by physical stimuli and not by dental treatment

or illness.[18,19] In addition, Jainkittivong et al and Trup JC reported that many patients with TN lost teeth due to unnecessary extractions.[9,20] The limitation of the present study is that the conclusion is based on observations from a single study centre. Thus, a prospective multicentre study is required.

### Conclusion:

The condition trigeminal neuralgia is not life-threatening. It can, however, cause life-long pain and be crippling. TN is often misdiagnosed as toothache, resulting in root canal therapy and tooth extractions. TN is often misdiagnosed as toothache, resulting in root canal therapy and tooth extractions. To recognize and manage this problem, an interprofessional strategy involving the primary care physician, dentist, neurologist, anesthesiologist, and neurosurgeon is required. Correct diagnosis and management can benefit patients and result in a good prognosis.

### References:

1. Pearce JMS: Trigeminal neuralgia (Fothergill's disease) in the 17th and 18th centuries . J Neurol Neurosurg Psychiatry. 2003, 74:1688. 10.1136/JNPN.74.12.1688.
2. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). Cephalalgia 2013; 33: 629–808.
3. Chavali S, Rath GP, Rajagopalan V, Chaturvedi A. Management of trigeminal neuralgia during COVID-19 pandemic. Asian J Neurosurg 2020;15:1102-3.
4. Majeed MH et al. Trigeminal Neuralgia: A Clinical Review for the General Physician. Cureus. 2018;10: e3750.
5. Koopman JS, Dieleman JP, Huygen FJ, de Mos M, Martin CG, Sturkenboom MC, et al. Incidence of facial pain in the general population Pain 2009;147:122-7.
6. Sunitha KC Prevalence of trigeminal neuralgia in Indian population visiting a higher dental care center in Chennai –A retrospective study
7. Siqueira SRDT, Teixeira MJ, Siqueirac J TT. Clinical Characteristics of Patients with Trigeminal Neuralgia Referred to Neurosurgery. Eur J Dent. 2009;3: 207–212.
8. Maarbjerg S, Stefano GD, Bendtsen L, Cruccu G. Trigeminal neuralgia – diagnosis and treatment. Cephalalgia 2017;7: 648–657.
9. Jainkittivong A, Aneksuk V, Langlais RP. Trigeminal neuralgia: A retrospective study of 188 Thai cases. Gerodontology 2012;29:e611-7.
10. Thomas R. Clinical and Radiological Profile of Trigeminal Neuralgia- A Retrospective Study. Journal of Clinical and Diagnostic Research. 2020;11: Oc27-OC30.
11. Katusic S, Beard CM, Bergstralh E, Kurland LT. Incidence and clinical features of trigeminal neuralgia, Rochester, Minnesota, 1945-1984. Ann Neurol 1990;27:89-95.
12. Barker FG<sup>2nd</sup>, Jannetta PJ, Bissonette DJ, Larkins MV, Jho HD. The long-term outcome of microvascular decompression for trigeminal neuralgia. N Engl J Med 1996;334:1077-83.
13. Dia Tine S, Tamba B, Gassama BB, Niang P, Dia L, Kébé Ndèye F, et al. Clinical and therapeutic aspects of trigeminal neuralgia. Apropos of 27 cases treated at the General Hospital of Grand-Yoffin Dakar. Odontostomatol Trop 2009;32:5-12.
14. Loh HS, Ling SY, Shanmuhasuntharam P, Zain R, Yeo JF, Khoo SP. Trigeminal neuralgia. A retrospective survey of a sample of patients in Singapore and Malaysia. Aust Dent J 1998;43:188-91.
15. Neto, H. S., Camilli, J. A., Marques, M. J. Trigeminal neuralgia is caused by maxillary and mandibular nerve entrapment: greater incidence of right-sided facial symptoms is due to the foramen rotundum and foramen ovale being narrower on the right side of the cranium. Med Hypotheses. 2005;65:1179-1182.
16. Rabinovich, A., Fang, J., Scrivani, S. J. Diagnosis and management of trigeminal neuralgia. Columbia Dental Rev. 2000; 5: 4-7.
17. Rai A et al Clinical Profile of Patients with Trigeminal Neuralgia Visiting a Dental Hospital: A Prospective Study. Indian J Pain 2017;31:94-9.
18. Zakrzewska JM. Trigeminal neuralgia and facial pain. Semin Pain Med 2004;2:76–84.
19. Loeser JD. Tic douloureux. Pain Res Manag 2001;6:156–65.
20. Türp JC, Gobetti JP. Trigeminal neuralgia versus atypical facial pain. A review of the literature and case report. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1996;81:424–32.