

## ORIGINAL RESEARCH

# Prevalence of Post Traumatic Trigeminal Neuralgia in Sabarkantha District

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### ABSTRACT

**Background:** Any trauma, whether accidentally or intentionally caused, is a common cause of trigeminal neuropathy. The trigeminal nerve supplies the orbit, the maxilla, and the jaw and performs both sensory and motor duties. The majority of PTTN instances are brought on by tooth extraction, root canal therapy, and any type of jaw fracture that affects the crown or root of a tooth. **Aims:** The goals of this study were to determine the incidence of PTTN in the Surgery, ENT and Dentistry outpatient department (OPD) and the relationship between traumatic tooth extraction and the occurrence of PTTN. **Methods and Material:** The study was done from January 2019 to December 2019, and patients from Surgery, ENT and Dentistry were chosen based on inclusion and exclusion criteria. Statistical Analysis Used: The descriptive frequency approach was used to analyze data acquired using the Statistical Package for Social Sciences (SPSS) software version 23. The outcomes are reported as frequency and percentages. **Results:** There were 6530 patients in total who had new cases reported to the Surgery, ENT and Dentistry; 258 patients with PTTN were noted among those. Males were more afflicted than females in this study's prevalence of PTTN patients, which was 1.55%. **Conclusions:** PTTN is most frequently a complication of iatrogenic trauma during dental extractions and other orodental surgical procedures carried out in the oral cavity with localized sensory deficits to the inferior alveolar nerve, lingual nerve, and branches of the maxillary nerves.

**Keywords:** Trauma, pain, posttraumatic trigeminal neuralgia

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### INTRODUCTION

The Latin words "tria," which means three, and "geminus," which denotes twin, are combined to form the English word "trigeminal." The fifth cranial nerve in the head is the trigeminal nerve. This nerve oversees giving the facial sensation.

The trigeminal nerve has two branches, one of which travels to the right side of the head and the other to the left. Trigeminal neuralgia (TN), commonly referred to as "tic douloureux," is essentially the most agonizing pain a person has ever experienced. Although it occasionally affects the region above the eye and around the nose, the discomfort primarily affects the bottom half of the face and jaw.<sup>1</sup>

The TN is described as abrupt, recurrent, strong pain along one or more branches of the fifth cranial nerve by the International organization for the study of pain.<sup>2</sup> According to the International Headache Society, TN is a painful condition that affects only one side of the face and is characterized by sharp, electric-shock-like pain that is localized to one or

more trigeminal nerve divisions.<sup>3,4</sup> The compression of the nerve root is the most prevalent theory that has been proposed for the etiology of TN.<sup>5</sup>

Nerve compression in the maxilla and mandible can be caused by traumatic injuries, traumatic extractions, different viral infections, foci of dental abscess, and bone resorption. This causes neuralgia of the nerve. The pain associated with classic TN is intermittent in nature, has been compared to an electric shock, and attacks only last a few seconds.<sup>6,7</sup>

The lips, the side of the jaw, the area under the eyes, and the eyelids can all be pain trigger points on the face. Shaving, applying cosmetics, drinking cold water, and other activities all have the potential to exacerbate pain episodes.<sup>8</sup> Women and people over the age of 50 are more likely to experience the illness. Only one side of the face is impacted by TN, and the right-side experiences symptoms more frequently than the left.<sup>9</sup> In light of the literature on posttraumatic trigeminal neuralgia (PTTN) that is currently available, this observational study was carried out to

determine the prevalence rate of PTTN in the patients presenting to the GMERS, Himatnagar at Sabarkantha district.

**SUBJECTS AND METHODS**

In this observational study, which took place from January 2019 to December 2019, a total of 6530 from Surgery, ENT and Dentistry department patients from GMERS, Himatnagar were assessed, and data on 258 PTTN cases following dental extraction were collected from previous dental records. These 129 PTTN patients were chosen based on the clinical diagnosis listed in the dental records, which stated that these PTTN patients who were included for this observation study had a history of brief, demographic information about the patient as well as the location of the involved jaw was included. According to the following inclusion and exclusion criteria, patients were chosen:

**INCLUSION CRITERIA**

- The patients had provided information about prior extractions between twelve months ago.
- Patients who reported having experienced paroxysmal pain that began after having a tooth extracted.
- Paroxysmal bouts of pain (electric/pricking type), affecting one or more divisions of the trigeminal nerve, lasting from a fraction of a second to two minutes.
- Both the diagnostic grading for Practice and Research for TN provided by Cruccu et al.<sup>10,11</sup> for signs and symptoms were followed in the patient's selection. Neuralgic pain criteria based on the classification on A.F. Kaufmann and M. Patel: Centre for cranial nerve disorders, Winnipeg, Manitoba, Canada (2001)<sup>10</sup> and the diagnostic grading for Practice and Research for TN given by Cruccu et al. Since the posterior part of the scalp, the back of the ear, and the angle of the jaw are all innervated by cervical nerves, the examining doctor or dentist must make sure that the pain does not radiate to those areas.

**EXCLUSION CRITERIA**

- Patient does not meet the sign and symptom requirements as specified by the A. F. Kaufman criteria and International headache society. Patient has known history of TN.
- Subjects less than 20 years old weren't considered.
- The individuals were excluded if discomfort persisted for eight months prior to extraction.
- Patients in critical condition with atypical pain symptoms that point to TN or a different diagnosis.

The study received permission from the institution's ethics committee. The study was explained to every patient, and those who were interested in participating gave their verbal agreement. The Statistical Package for Social Sciences (SPSS) software version 23 was used for the descriptive frequency method analysis of the data gathered. Results are shown as percentages and frequency.

**RESULTS**

Out of the 258 PTTN instances totaled, 6530 new patients from the Surgery, ENT and Dentistry OPD were screened as part of this twelve months observational study. The prevalence of PTTN in the current study is 1.55%. In this study, men made up 60.4% more participants than women, who made up 39.5%. The age range of 41-60 years accounted for 58.1% of all cases, with 21-40 years accounting for 21.7% [Table 1, Graph 1].

Out of the total number of PTTN patients (n = 258), it was found that the lower jaw was more commonly affected, with 206 PTTN patients (79.8%) compared to only 42 (16.2%) cases in the upper jaw, and only 10 (3.8%) cases involving both jaws [Table 2, Graph 2]. In contrast to the left side, which impacted 84 patients (32.5%), the right side (upper/lower) affected 174 patients (6.74%) [Table 3, Graph 3]. Thus, across all patient age groups, the right quadrant (upper/lower) of the jaw was most frequently impacted.

The Departments of Dentistry, ENT and Surgery worked together to continue treating all the patients who had been diagnosed with PTTN.

**Table 1: Demographic distribution of patients (n=258)**

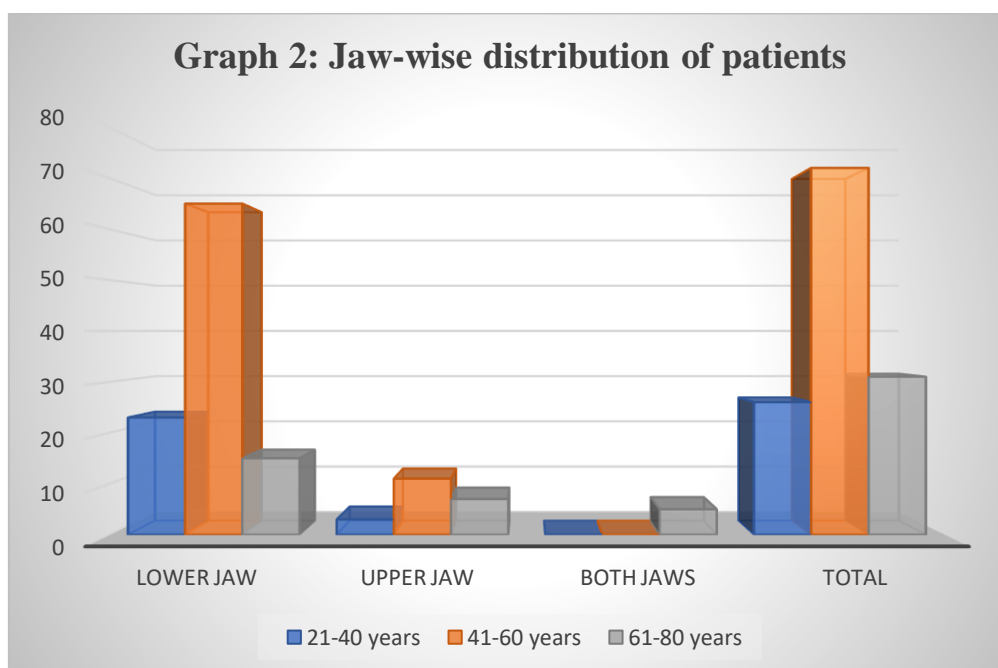
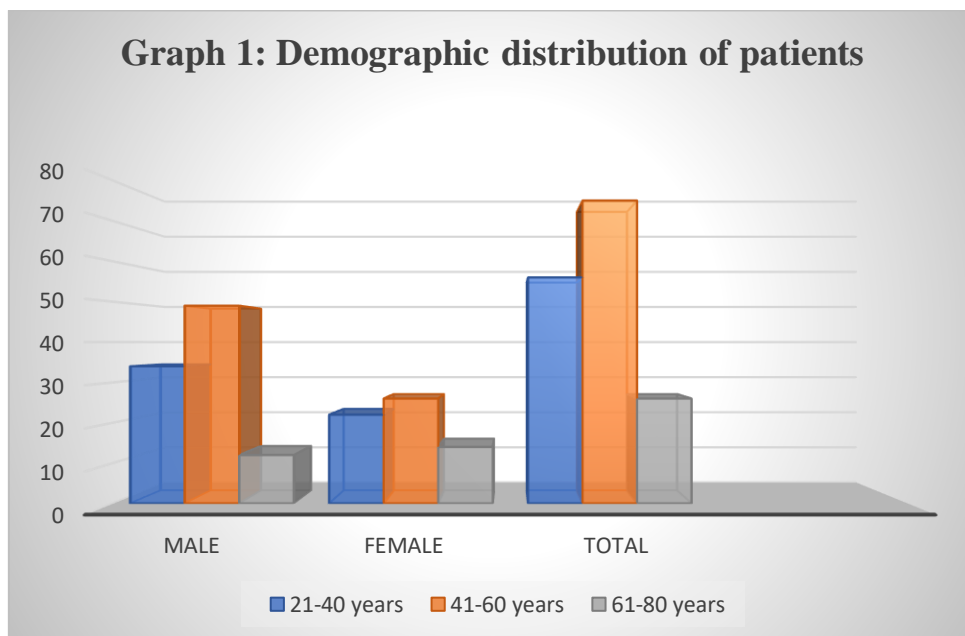
Age/sex	21-40 years n (%)	41-60 years n (%)	61-80 years n (%)	Total (n/%)
Male	34 (13.1)	49 (37.9)	12 (9.3)	78 (60.4)
Female	22 (8.5)	26 (20.1)	14 (10.8)	51 (39.5)
Total (n/%)	56(21.7)	75 (58.1)	26 (20.1)	129 (100)

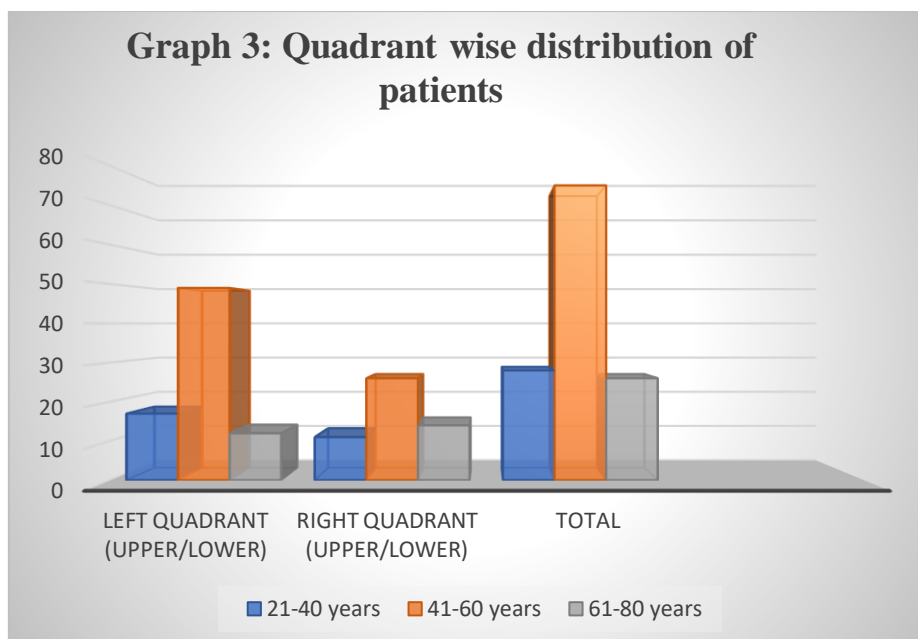
**Table 2: Jaw wise distribution of patients (n=258)**

Jaw involved	21-40 years n (%)	41-60 years n (%)	61-80 years n (%)	Total (n/%)
Lower jaw	23 (17.8)	65 (50.3)	15 (11.6)	103 (79.8)
Upper jaw	3 (2.3)	11 (8.5)	7 (5.4)	21 (16.2)
Both jaws	0	0	05 (3.8)	05 (3.8)
Total (n/%)	26 (20.1)	72 (55.7)	31 (23.9)	129 (100)

**Table 3: Quadrants (upper/lower) wise distribution of patients (n=258)**

Quadrant involved	21-40 years n (%)	41-60 years n (%)	61-80 years n (%)	Total (n/%)
Left quadrant (upper/lower)	17 (13.1)	49 (37.9)	12 (9.3)	78 (60.4)
Right quadrant (upper/lower)	11 (8.5)	26 (20.1)	14 (10.8)	51 (39.5)
Total (n/%)	28 (21.7)	75 (58.1)	26 (20.1)	129 (100)





### DISCUSSION

TN has been discussed in literature for many years. Aretaeus of Cappodocia, who lived in the second century A.D., and the Arab physician Jujani, who lived in the eleventh century A.D., both described unilateral facial pain that results in facial spasms.<sup>5</sup> In 1773, John Fothergill provided a thorough description of the characteristics of TN, including its paroxysmal nature and correlation with triggers like eating, speaking, or touching the face.<sup>12</sup> TN is a well-known condition that is typical of ageing and has long been recognized as such,<sup>13</sup> in 40% of instances, PTTN is secondary to trauma; tooth extraction is the most frequent cause, and localized sensory abnormalities to the inferior alveolar nerve, lingual nerve, and branches of the maxillary nerve result.<sup>14,15</sup>

This study intends to emphasize the PTTN, one of the TN variants, as well as its connection to iatrogenic nerve injury.<sup>9,10</sup> The literature that is currently accessible reveals a very low prevalence rate of PTTN patients. The prevalence of PTTN cases was 1.55% in the current study, which is lower than the study by Kumar et al., where the prevalence rate of PTTN was 2.11%.<sup>16</sup> Regarding the etiology of PTTN, several factors have been identified in the literature. These include inadequate surgical procedures used during tooth extraction and may also be related to inadequate local anesthetic technique used during local anesthetic solution injection.<sup>17</sup>

In the current observational investigation, sensory dysfunction was found in pertaining to PTTN significantly higher in males, 60.4%, compared to females, 39.5%, in the 41–60 age group.

To the best of our knowledge, it is quite uncommon. The only study that was comparable to ours in terms of age group 40–60 years in which males outnumbered girls by a margin of 55% was one conducted by Rai et al.<sup>18</sup> Studies by Kumar et al., Loh et al., and Katusic et

al., corroborated the female dominance in the age bracket of 40 to 60 years, which is found to be in conflict with the present study, in the literature that is currently available.<sup>14,16,19</sup> Although PTTN cases are more common in the lower jaw, where there are 206 cases, or 79.2% of all cases, compared to 42 cases in the upper jaw, or 16.2%, the cause may be lower impacted molars that are close to lower nerves, such as the lingual nerve, inferior alveolar nerve, and branches of the mandibular nerve. According to data from Kumar et al.'s study, 192 (85.7%) of the PTTN cases were found in the lower jaw.<sup>16</sup>

In contrast to the left quadrant of the jaw, the right side of the skull has a small foramen through which branches of the mandibular nerve enter, which may account for the majority of PTTN patients being observed.<sup>20</sup> Similar to the study conducted by Kumar et al., where right quadrant involvement was 57.1%, the current study shows that the right quadrant (upper/lower) of the jaw is more involved, at 67.4%, than the left quadrant, at 32.5%.<sup>17</sup>

The reported data from the current observational study revealed that dental extractions may have been performed using subpar surgical techniques, and patients may have undergone treatments by unqualified individuals (quacks) because of their low socioeconomic status. Additionally, this study recommended that the involvement location be unilateral rather than bilateral in the jaw. The lower jaw is more influenced in both sexes across all age groups in the current study than the upper jaw, which is an unusual occurrence. There are also greater preferences for male sex than female, which is also unique.

### CONCLUSION

Dental extractions with localized sensory abnormalities of the trigeminal nerve and its branches

are the most frequent secondary trauma cause of PTTN. Small sample size and a unicentric strategy were limitations of this study.

Dental practitioners should do additional research using a large sample size and a multicentric approach to examine faulty surgical procedures used in dental extractions that may result in PTTN as well as new pharmaceutical regimens to treat TN pain, which has a detrimental impact on the quality of life of patients who are suffering from it. This multicentric approach can only be accomplished by using sterile conditions and suitable standard surgical techniques while performing dental extractions or any other orodental surgical surgery. To effectively treat PTTN patients, this study also emphasizes a positive working relationship with the department of ENT, Surgery and Neurology.

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Nil.

### CONFLICTS OF INTEREST

There are no conflicts of interest.

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