Clinical profile of trigeminal neuralgia in the patients visiting a tertiary care hospital in North India

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Abstract

Background and aim: Trigeminal neuralgia affects the facial areas supplied by trigeminal nerve and its branches. It is associated with severe pain that affects daily life of a patient. Hence in this study we aimed to study the clinical characteristics of trigeminal neuralgia in the patients attending the Dental and ENT OPD in a tertiary care hospital.

Materials and Methods: This study involved 50 patients diagnosed with trigeminal neuralgia for the first time. The basic data of patients like age, gender, side of face and other clinical characteristics were recorded and analysed.

Results: In this study, males were 58% of patients were males and 42% were females. Maximum incidence was observed in the age group of 51-60 years (38%). 62% of the patients showed right side involvement while 38% showed left side involvement. The most common trigeminal branch involved was mandibular branch (36%) with moderate pain (34%) and electric shock like pain (54%).

Conclusion: It can be concluded from this study that trigeminal neuralgia frequently affected males. Elderly people are more vulnerable to the disorder with frequent involvement of the right side of the face. Most of patients in this study reported moderate pain. Since the pain initially originates in oral cavity, the knowledge of trigeminal neuralgia is very crucial in the dental sector as most of the patients consult dentists for the treatment.

Key words: Pain, Neuralgia, Mandibular nerve, Surgery,

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Introduction

Often called as a suicide disease, trigeminal neuralgia (TN) is a neurological disorder characterized by sudden, severe and recurrent facial pain that may last for few seconds to several minutes. The pain is usually distributed in one or more nerve branches from the trigeminal nerve. The attack of pain may occur any time during the day or even at night but occurrence during sleep has been rarely reported [1].

The painful attacks are induced by arousal of specific areas also called trigger points that are

especially ipsilateral to pain. However, these points may also lie on the same or different branches of trigeminal nerve [2]. The factors that provoke the trigger zone include brushing, chewing, speaking, touching face (as in case of washing) etc [3]. Cold water and wind can also trigger the pain. A recent study reported that most of the trigger points are pre-dominantly present in nasal and perioral regions while the common provoking factors for pain attacks were facial touch and speaking [4]. Pain may be like stabbing, electric shocks, burning, pressing, crushing, exploding, shooting, boring, shock like sensation migraine like, piercing, pricking or a combination. Generally, TN is of two varieties with Type 1 as intermittent pain and Type 2 as constant.

International headache society has categorized trigeminal neuralgia as symptomatic trigeminal neuralgia and classic trigeminal neuralgia. The classic variant is caused due to microvascular compression at the region of entry of trigeminal nerve root to the brain stem while the symptomatic variant occurs as a result of structural lesions [5].

Though the etiology of trigeminal neuralgia is still to be explored, several possible causes have been put forth like trigeminal nerve compression, herpes infections, demyelination of associated nerves etc [6]. However, of the proposed factors, vascular compressions of trigeminal nerve at posterior fossa (trigeminal nerve root entry zone) leading to the nerve injury is suspected to be a major cause [7, 8]. Trigeminal neuralgia mainly affects mandibular and maxillary divisions of trigeminal nerve while the involvement of ophthalmic division is quite less. The specific divisions of trigeminal nerve involved can be identified by using local anesthetic blocks at various sites of distribution of nerve [9,10].

The pain sensation in trigeminal neuralgia is mostly unilateral in 95% of cases. It means only one side especially right side of the face is frequently affected. The disorder more commonly occurs in female and usually affects the elderly people (> 50 years of age) and hypertensive patients [11].

Available records showed that the incidence of trigeminal neuralgia is 126/100000 person/ year with peak of onset occurring at the ages between 50-70 years [12]. Previous studies have shown that 60% of the patients having trigeminal neuralgia are female. In female the annual incidences was observed to be 59 cases/100000 females while for males it was 34 cases/100000 males [13].

In trigeminal neuralgia clinical examination of patients may not represent any neurological deficit; therefore the pain characteristics and response of patients to carbamazepine serve the important factors in the diagnosis of the disorders. Both pharmacological and surgical modes of treatments are available and the treatment choice depends upon the response of the patients on pharmacotherapy. In 80% of cases administration of carbamazepine has been proven to be an effective mode of treatment. Surgical procedures are usually applied when anticonvulsants like carbamazepine, phenytoin, baclofen, gabapentin, pimozide etc remain ineffective as medicinal approach of treatment [14].

Though, percutaneous ablation procedure is safe and simple with short duration of hospital stay, it is accompanied with short relief, high recurrence rate and requirement of repeated interventions. Currently the most effective treatment approach for trigeminal neuralgia is microvascular decompression [15].

Despite being benign in nature trigeminal neuralgia is debilitating stage since it not only affects the quality of living but may also become refractory to several treatment modalities later. Also there is a great chance of it being misdiagnosed due to unclear laboratory and physical investigations which can further aggravate the condition. Although the clinical profile of trigeminal neuralgia is not new, a very few studies are available showing the clinical characteristics among the patients visiting a tertiary care hospital. Therefore, the present study was set up to evaluate clinical profile of patients with trigeminal neuralgia is different age groups and gender and compare the results with that of previous studies.

Material and methods

This study was a prospective study carried out with 50 patient of trigeminal neuralgia in Maharshi Vashishtha Autonomous State Medical College, Basti, UP from April 2019 to October 2022. Before the study; approval was obtained from ethical committee of the institute. The patients were briefed about the study and written

consent was taken from each patients. The patients selected for this study was based on the following inclusion and exclusion criteria.

Inclusion Criteria

- Patients willing to participate
- Patients diagnosed with trigeminal neuralgia for the first time
- In case of patients with unclear clinical presentation patients responsive to test dose of carbamazepine was included.

Exclusion Criteria

- Patients not consenting to participate
- Patients with history of trauma or surgeries

After the selection of patients, basic details of each patient like name, age and gender were noted. A structural questionnaire was used to interview patients for the history of trigeminal neuralgia. It included questions regarding side of the face, trigeminal division and pain radiation (categorised as within division, outside division and outside face), pain character and onset. The sensitivity of pain was documented on a visual analogue scale. McGills pain questionnaire was used to evaluate the quality of pain. Periodicity of occurrence of pain in terms of frequency, duration of pain, duration of refractory period, provoking factors and relieving factors were also assessed. A standardised examination of head and neck was performed to assess the trigger point and sensory testing to identify the division of trigeminal nerve involved. Any dental and bony pathologies were ruled out with the radiographic examinations.

Results

In this study, 20% of the incidence of trigeminal neuralgia was observed in the age group of 51-60 years, followed by 26% in the age group of more than 60 years. The least incidence of 4% was observed in the age group of 21-30 years. Of 50 patients, 58% (29) of the patients were males and 42% (21) of the patients were females (table 1).

62% (31) of the patients showed involvement of the right side of the face where 38% (19) of the patients showed left side involvement. Maximum involvement of right side and left side of the face was observed in the age group of 51-60 years (38.7%, 36.8% respectively) (table 2).

In male patients, 65.6% of the patients showed right side involvement and 34.5% of patients showed left side involvement. Similarly in case of female, the same were 57.1% and 42.9% respectively (table 3).

In this study, in 24% of the patients there was involvement of venous compression while 76% of the patients showed arterial involvement (figure 1).

Most of the patients showed the involvement of mandibular nerve (36%) in trigeminal neuralgia, followed by maxillary nerve (26%). There was combined involvement of mandibular and maxillary nerves in 20% of the patients. In both the right and left side of the face, most of the patients exhibited frequent involvement of mandibular nerve (32.3% and 42.1% respectively) (table 4).

34% of the patients reported moderate pain while mild, severe and very severe pain was reported by 28%, 22% and 16% of the patients respectively (figure 2).

54% of the patients reported shock like pain while burning, stabbing and throbbing pain was reported by 20%, 8% and 18% of the patients respectively (figure 3).

92% of the patients involved in this study did not show any complications. Of the rest, the complications observed were facial palsy (8%), recurrence (15%), persistent pain (10%) psuedomeningocele (4%) and deafness (6%) (table 5).

Table 1: Patient distribution based on age and gender

Age (years)	Male (N/%)	Female (N/%)	Total (N/%)
21-30	2 (6.9%)	0	2 (4%)
31-40	4 (13.8%)	2 (9.5%)	6 (12%)
41-50	6(20.7%)	4 (19%)	10 (20%)
51-60	11 (37.9%)	8 (38.1%)	19 (38%)
>60	6 (20.7%)	7 (33.3%)	13 (26%)
Total	29 (100%)	21 (100%)	50 (100%)

Table 2: Involvement of facial side based on age

Age (years)	Right (N/%)	Left (N/%)	Total (N/%)
21-30	2 (6.4%)	0	2 (4%)
31-40	2 (6.4%)	4 (21.1%)	6 (12%)
41-50	7 (22.7%)	3 (15.8%)	10 (20%)
51-60	12 (38.7%)	7 (36.8%)	19 (38%)
>60	8 (25.8%)	5 (26.3%)	13 (26%)
Total	31 (100%)	19 (100%	50 (100%)

Table 3: Involvement of facial side based on gender

Side	Male (N/%)	Female (N/%)	Total (N/%)
Right	19 (65.5%)	12 (57.1%)	31 (62%)
Left	10 (34.5%)	9 (42.9%)	19 (38%)
Total	29 (100%)	21 (100%)	50 (100%)

Figure 1: Involvement of vessel

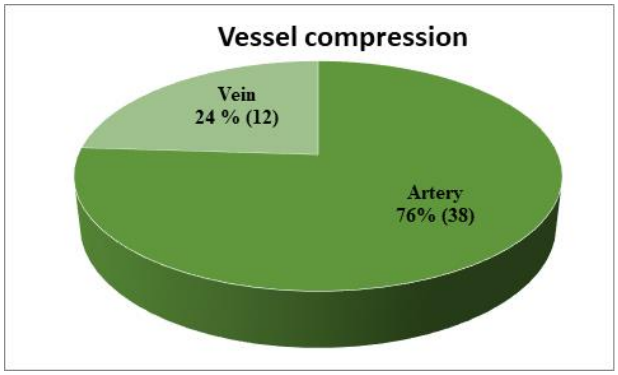

Table 4: Distribution based on nerve involvement on right and left side of face

Nerve	Right (N/%)	Left (N/%)	Total (N/%)
Mandibular (V3)	10 (32.3%)	8 (42.1%)	18 (36%)
Maxillary (V2)	8 (25.8%)	5 (26.2%)	13 (26%)
Ophthlmic (V3)	3 (9.7%)	1 (5.3%)	4 (8%)
V1 and V2	3 (9.7%)	1 (5.3%)	4 (8%)
V2 and V3	7 (22.5%)	3 (15.8%)	10 (20%)
V1 and V3	0	1 (5.3%)	1 (2%)
Total	31 (100%)	19 (100%)	50 (100%)

Figure 2: Distribution based on severity of pain

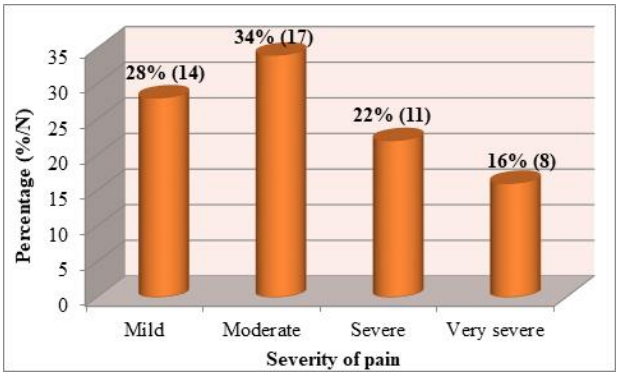

Figure 3: Distribution based on quality of pain

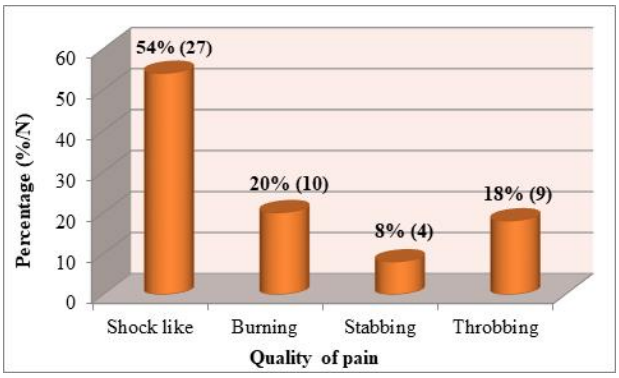

Table 5: Distribution based on complications associated with trigeminal neuralgia

Complications	No (%)
Nill	46 (92%)
Facil palsy	4 (8%)
Recurrence	7 (14%)
Persistent pain	5 (10%)
Psuedomeningocele	2 (4%)
Deafness	3 (6%)

Discussion

Trigeminal neuralgia (TN) is the neurological disorder associated with trigeminal nerve. In the present study the incidence of TN was high in the age group of 51-60 years and >60 years. The occurrence of TN was high in male with male to female ratio of 1.38:1. The result swere comparable to the reports of Yadav S *et al* [16], Rai A *et al* [17] and Katheriya G *et al* [18]. However, in contrast to this study, the studies of Bangosh TH *et al* [19] and Ahmad M *et al* [20] showed high prevalence of TN in females where the ratio of male to female was 1:2.

In this study, the side of the face involved was 62% for the right and 38% for the left side. 65.6% of male demonstrated right side occurrence while it was 57.1% for females. Study of Neto HS *et al* [21] and Rabinovich A *et al* [22] demonstrated frequent involvement of the right side of the face compared to the left side in TN which was in line with this study. The right sided occurrence was most frequently observed in the age group of 51-60 years, while left side involvement was frequently seen in 41-50 years age group. These results were concordance with that of Shah SA *et al* [23]. The possible explanation of more frequent involvement of right side of the face could be the narrower size of foramen ovale and foramen rotundum on the right side.

24% and 76% of the patients showed involvement of veins and arteries respectively in vessel compression. ISMD (Indian study of microvascular decompression) reported arterial involvement in 84% of cases and venous involvement in 5 % cases while there was involvement of both arteries and veins in 11% of cases. Further in a study of Peker S *et al* [24], the arterial loop was present in 86% of cases and venous loop was present in 14% of cases. Similarly, another study also reported trigeminal nerve compression by arterial loop, venous loop and both in 85%, 12% and 3% of cases respectively [25].

In the present study, the most frequently involved division of trigeminal nerve in the development of trigeminal neuralgia was mandibular nerve (36%) followed by maxillary nerve (26%) and combination of mandibular (V3) and maxillary nerves (V2) (20%) which was in accordance with the study of Casey KF *et al* [26] and Shankland WE [27]. However study of Rai A *et al* [17] showed V2 division (maxillary division) to be commonly involved. The authors also reported high incidence of V2 and V3 combination which was similar to this study. The high prevalence of mandibular division in most of the studies may be due to the fact that patients having maxillary or any other craniofacial pain consult ophthalmologist, ENT surgeons or physicians while those presenting mandibular pain consult oral surgeons for treatment.

34% of the patients in this study had moderate pain followed by mild, severe and very severe pain in 28%, 22% and 16% of cases. Tolle T *et al* showed that 64% of the patients in their study developed moderate pain due to TN [28].

On evaluating quality of pain based on McGills questionnaire, it was found that 54%, 20%, 8% and 18% of patients reported to have shock like pain, sharp pain, burning pain and throbbing pain respectively. However, in the study of Jainkithivong A *et al,* the patients were found to have sharp pain (77.6%), electric shock like pain (19.1%) stabbing pain (9.6%), throbbing pain (6.4%), burning pain (4.2%) and numbness (6.9%) [29].

In this study 92% of the patients did not show any complications. Of the rest, the most commonly observed complications were recurrence (14%), persistent pain (10%), facial palsy (8%), deafness (6%) and pseudomeningocele (4%). Previous studies have reported several complications associated with TN in their patients. Those complications include facial palsy, deafness, ataxia and diplopia, recurrence, meningitis, pseudomeningocele and death. Study of Sundou M *et al* showed presence of persistent pain in 15% of cases and recurrence of TN in 3% of cases. Likewise, 1% of the patient showed CSF leak and meningitis, 6% showed pseudomeningocele, 1% showed facial palsy, 11% showed persistent pain and 8% of the cases showed recurrence [30]. In the study of Gunther T *et al* death was observed in 3% of cases which was in contrast to this study as no casualty was reported [31].

Conclusion

Trigeminal neuralgia is a benign yet a painful disorder associated with trigeminal nerve. It adversely affects the quality of living in the patients suffering from this disorder. From this study, it was found that trigeminal neuralgia commonly affects elderly people with more frequent involvement of the right side of the face. The commonly involved trigeminal branch is mandibular division followed by maxillary division. Some patients also showed involvement of combination of trigeminal branches. Patients are initially treated with anticonvulsants but for the patients unresponsive to pharmacotherapy, surgical treatment is preferred. The main limitation of this study is the use of small sample size, so further large scale studies are recommended to explore clinical picture and pathophysiology of trigeminal neuralgia. It is

because the pain initially originates in oral cavity so most of the patients consult the dentists. Hence dentists also should have sound knowledge of characteristics of trigeminal neuralgia.

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