Trigeminal Neuralgia: Revisiting clinical characteristics in the Indian scenario

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SPSS: Statistical Package for Social Sciences

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Abstract
Context: The diagnosis of trigeminal neuralgia has been a source of confusion for the clinicians since long and remains a difficult condition to manage still with no treatment modality providing a satisfactory management of the patient. Objectives: The objectives of the study were to assess the sex, age, branch and side distribution in patients with trigeminal neuralgia in the Indian sub-continent.

Methods and Material: For each of the subject, a detailed, structured case history was recorded and the findings were recorded in a prepared proforma. Statistical analysis used: The statistical analysis was carried-out using SPSS package, 10.5.

Results: Out of 30 trigeminal neuralgia patients, 16 patients (53%) were males and 14 patients (47%) were found to be females. The mean age of trigeminal neuralgia patients was estimated as 50.46 years. Right side of the face was affected more than left with a predilection for maxillary division of the trigeminal nerve.

Conclusions: Trigeminal neuralgia can have varied clinical presentation in terms of geographic distribution. A careful evaluation of the history and the identification of the characteristic nerve involved are important in any case for an accurate diagnosis and management in patients suffering from trigeminal neuralgia.

Citation:

1. Introduction

1.1 Etymology
Trigeminal neuralgia or ‘tic douloureux’ is most easily recognized in medical practice as is one of the well-recognized oro-facial pains which is characterized as a sudden, usually unilateral, brief, stabbing recurrent pain in the distribution of one or more branches of the fifth cranial or trigeminal nerve. (Adams CBT, 1989) It may have no apparent cause (idiopathic, essential or classic trigeminal neuralgia) or be secondary to a major, recognizable neurological disorder (secondary or symptomatic trigeminal neuralgia). Secondary or symptomatic trigeminal neuralgia can be related to slow growing tumors as cholesteatomas, meningiomas or neurinomas compressing the trigeminal nerve root near the dorsal root entry zone or a generalized systemic disease as multiple sclerosis, the most important cause for secondary or, symptomatic trigeminal neuralgia, typically associated with this chronic oro-facial neuralgia. (Jensen, 2002; Love, Coakham, 2001; Nurmikko, Eldridge, 2001)

1.2. Aetiology behind Trigeminal Neuralgia
Infact, many investigators have been refuting the term idiopathic trigeminal neuralgia also since in these cases of no apparent discernible causes of trigeminal neuralgia, the neuralgic pain is described in terms of a neurovascular conflict seen due to vascular compression of the trigeminal nerve root by...
tortuous or aberrant vessels. Microsurgical interventions in the posterior fossa in such patients almost have always revealed a vessel, most commonly the superior cerebellar and also, the anterior inferior cerebellar artery having an offending contact with the trigeminal nerve root resulting in localized demyelination and ectopic triggering of neuronal discharges. Further support for this comes from the numerous MR imaging reports which say and confirm a frequent contact between vessels and the main nerve root. (Meaney et al., 1995) Micro-vascular decompression has been seen to consistently relieve the pain in a majority of the cases. (Barker FG II, Jannetta PJ, Bissonette DJ et al, 1996) Nevertheless, there is no dearth of the researchers who have confirmed the presence of such neurovascular conflicts in about 7-12% of the cases during routine autopsy examinations with no history of trigeminal neuralgia and bilateral compressions of the nerve root near the root entry zone on MRI but absence of bilateral symptoms. (Cruccu et al., 1987)

Other possible systemic etiologies for the onset of trigeminal neuralgia include Lyme disease and Charcot Marie syndrome. Cerebrovascular disease also can give ride to the initiation of neuralgic symptoms associated with the trigeminal nerve and the primary lesions held etiological behind these include infarctions involving the spino-trigeminal nucleus or tract. Trigeminal neuralgia has been reported in patients with pontine (Lizuka et al., 2006) and lateral medullary (Warren et al., 2006) infarctions as well as in association with brachium pontis cavernous angioma (Vitek, Tettenborn, 2002).

1.3 Cardiac after-effects of Trigeminal Neuralgia and other Chronic Pain Syndromes: Hypertension and cardiac abnormalities have also been found concurrently in patients suffering from trigeminal neuralgia although some researchers believe them to be secondary to the primary pain disorder. It is important to note here in these cases that intense pain might have been responsible for the neuro-vegetative abnormalities seen in such sets of patients and blood pressure increases are expected in such patients when patients are in crises. (Teruel et al., 2009) On the other hand, crises could occur more frequently in patients who are the prime sufferers of hypertension supporting the vascular compression etiology for the initiation of neuralgic pain. Trigeminal neuralgia is credited to be one of the most excruciating neuralgic pains and cardiac compromise might be seen after a long period of suffering. This fact gains significance as these patients should be monitored carefully and are ideal candidates for an early surgical intervention to prevent further complications. (Brown, Preul, 1988; Dominguez et al, 1994; Natarajan, 2000; Schaller, 2005; Tatli et al., 2008) Several factors thus can possibly contribute towards trigeminal neuralgia and the hypothesis of its multifactorial etiology could be arrived at.

1.4 Trigeminal Neuralgia- A unique Pain Syndrome
Although trigeminal neuralgia is classified as neuropathic pain as it is a direct consequence of somatosensory system lesion, it has unique features that make it different from other neuropathic pain. Trigeminal neuralgia has classic symptoms that could rarely be mistaken as any other disorder and is usually recognizable by a correct elicitation of the patient history alone. Pain distribution is unilateral (bilateral trigeminal neuralgia is sometimes seen in patients afflicted with multiple sclerosis) and follows the sensory distribution of trigeminal nerve primarily affecting the maxillary and mandibular divisions. The right side of the face is involved more frequently than the left and the disorder is more common in women than in men (3:2). Pain, usually referred to as stabbing or electric-shock-like, is brief and paroxysmal, lasting for a short duration of time, usually few seconds with no pain in between the paroxysms however, there is sometimes described an after-pain that fades away slowly. Attacks of trigeminal neuralgia are usually initiated by mild muco-cutaneous stimulation in the territory of the affected trigeminal nerve, called the trigger zones. Pain provokes brief spasm of the muscles in the affected area, thus producing ‘tic’. There can be long pain-free periods in the early years of the condition however these remission periods gradually become shorter as the duration of the neurological disorder progresses. (Abraham, Chandy, 1962; Backonja, Serra, 2004; Cruccu et al., 2006; Loh et al., 1998; Merskey, Bogduk, 1994; Patrick, 1914; Scrivani et al., 2005; Shah et al., 2008; Zakrzeswa, 2002)

The incidence of trigeminal neuralgia is about 4-5 per 1,00,000 people per annum with the ages of peak incidence of classic trigeminal neuralgia being the 60s and 70s. (Hall et al, 2006; Kalyanaraman, Ramamurthi, 1970; Katusic et al., 1990; MacDonald et al., 2000) Most patients respond well to carbamazepine. Second-line pharmacotherapies include
baclofen, gabapentin, lamotrigine and phenytoin. For medically intractable trigeminal neuralgia, micro-vascular decompression is the modality of choice however radiosurgery and other ablative techniques are also increasingly being used and are also successful in treating medically refractory cases. (Byrd, Mackey, 2008; Casey, 2005; Cheshire, 2005; Daftary et al., 1965; Harris, 1940; Hunt, Patwardhan, 2007; Rabinovich et al., 2005; Rowbotham, 1954; Shankland, 1993; White, Sweet, 2004)

1.5 Purpose of the Study with Aim
The study was planned in the Department of Oral Medicine and Radiology, Government Dental College and Research Institute, Bangalore, India in collaboration with Department of Psychiatry, Bangalore Medical College and Research Institute and Associated Hospitals, Bangalore, India to determine the clinical parameters in the regional population in comparison with the international standards.

2. Materials and Methods

2.1 Brief Outline of the Study with Objectives
A hospital based cross-sectional study was carried out on 30 patients diagnosed with Trigeminal neuralgia who visited the Department of Oral Medicine and Radiology, Government Dental College and Research Institute, Bangalore during a period of 3 months from Dec 2010 to March 2011. The objectives of the study were to assess the sex, age, branch and side distribution in patients with Trigeminal neuralgia.

The diagnosis was based on a detailed history, clinical examination and a history of the use of carbamazepine for the relief of pain by the patients. For each of the subject, a detailed structured case history was recorded and a thorough clinical examination was carried out. The branch of nerve involved was identified based on the history of the patient according to the site affected and was confirmed with a diagnostic injection of local anaesthetic (2% lignocaine with 1:2,00,000 adrenaline) at the identified site. The findings were recorded in a prepared proforma.

2.2 Statistical Analysis Used
The statistical analysis was carried-out using SPSS package, 10.5.

3. Results
Out of 30 Trigeminal neuralgia patients, 16 patients (53%) were males and 14 patients (47%) were found to be females. [GRAPH.1] The mean age of Trigeminal neuralgia patients was estimated as 50.46 years, wherein in male patients, it was seen as 49 years as compared to 52 years for the female patients. In our study, out of 30 patients, 2 patients (7%) were seen to have Trigeminal neuralgia involving LV2 [LV-left fifth, 2-maxillary division of Vth cranial or trigeminal nerve] & LV2, V3 [V3-mandibular division of Vth cranial or trigeminal nerve] branch, 8 patients (27%), LV3 branch, 9 patients (30%) involving RV2 [RV-right fifth, 2-maxillary division of Vth cranial or trigeminal nerve] branch, 4 patients (13%) involving RV2, V3 [V3-mandibular division of Vth cranial or trigeminal nerve] branch and 5 patients (17%) involving RV3 branch. [Graph.2]

Graph1: Gender distribution in Cases

Graph 2: Comparison of the involvement of various branches of the Trigeminal nerve in cases

4. Discussion
Trigeminal neuralgia is a condition likely to increase in prevalence, and to continue to challenge general practitioners and geriatricians alike in the near future. Trigeminal neuralgia has an incidence of 4-5 per 1,00,000 of the population. It is nearly twice as common in women, and the incidence increases in age to around 1 in 1,000 patients older than 75 years of age. Rarely, familial
cases have been reported. (Kalyanaraman, Ramamurthi, 1970).

Upon literature review, it was interesting to note that 3 reports from India demonstrated a male predominance as against the female predominance revealed in many studies conducted in the past. (Abraham, Chandy, 1962; Daftary et al., 1965; Kalyanaraman, Ramamurthi, 1970) Our study also confirmed such previous findings from India reporting a higher male patients predilection towards this chronic, crippling neuralgic pain. Again a number of the studies conducted in the past reveal the peak age of onset in between the fifth to eighth decades of life. Similar age predisposition was seen in our study wherein the mean age of trigeminal neuralgia patients was estimated as 50.46 years. This finding supports the mandate or at least a need to subject patients under 40 years of age to a detailed neurological assessment in the face of a similar neuralgic pain to rule out the possibility of secondary or systemic causes. (Harris, 1940; Katusic et al., 1990; MacDonald et al., 2000; Patrick, 1914; Rowbotham, 1954)

Also, there is some controversy about the frequencies of presentation in the right and left sides. The right side of the face is more commonly affected than the left possibly due to the narrower foramen rotundum and ovale on right side compared to the left side. (Neto et al., 2005) This hypothesis again got a supporting evidence from our study wherein right side was seen to be more commonly afflicted than as compared to the left side. White and Sweet (White and Sweet, 2004) reported right-sided pain in approximately 61% of the patients with left-sided pain in around 36% and bilateral representation in around 4% of the affected patients. Most of the published studies have revealed that the mandibular division is the most commonly involved with the ophthalmic division least affected. (Byrd, Mackey, 2008; Casey, 2005; Cheshire, 2005; Cuccu et al., 2006; Daftary et al., 1965; Hall et al., 2006; Harris, 1940; Katusic et al., 1990; Loh et al., 1998; MacDonald et al., 2000; Patrick, 1914; Rabinovich et al., 2000; Rowbotham, 1954; Shankland et al., 1993) reported that a third of the patients in their study presented with neuralgic pain involving both the second and third divisions of the fifth cranial or trigeminal nerve. The frequency of involvement of the maxillary division is reported to be in between the mandibular and ophthalmic divisions. Casey et al (Casey KF, 2005) found that the symptoms were predominant in the mandibular (15%), maxillary (17%) and both the divisions were involved in around 32% of the patients. Katusic et al (Katusic et al., 1990) showed involvement of the maxillary and mandibular divisions in almost same proportions with ophthalmic division being least commonly affected. All the three divisions were though seen to get affected in the beginning in around 17% of the patients at the onset of the neuralgic pain. In our study, out of 30 patients, 2 patients (7%) were seen to have Trigeminal neuralgia involving LV2 & LV2, V3 branch, 8 patients (27%), LV3 branch, 9 patients (30%) involving RV2 branch, 4 patients (13%) involving RV2, V3 branch and 5 patients (17%) involving RV3 branch.

The pain resulting from trigeminal neuralgia imposes a substantial burden on the patients with some patients gripped by an overwhelming fear of the onset of pain by a mere touch or unperceived stimulation of the trigger leading to an acute attack of the neuralgic pain. (Cheshire, 2003) Wartenberg (Wartenberg, 1958) suggested that the hallmark of trigeminal pain could be paroxysms of pain confined to one or more of the three divisions of the trigeminal nerve. The pain is predominantly unilateral and is described as electric-shock like, lancinating, focal and sharp. It can last for seconds to minutes initially and sometimes lasts as long as one hour. Usually the patient is symptom-free in between the attacks although later in the course of disease, patients may complain of a dull, aching, constant pain in the same distribution as the paroxysms. (Tyler et al., 2002).

The use of medications may add to the diagnosis. There are reports of the unique sensitivity of trigeminal neuralgia to the drug, carbamazepine that is credited to decrease or alter the pain in around 70-90% of the patients afflicted. There are no convincing reports however that the drug reduces trigger zone hyperalgesia. The response to the drug might not eliminate the diagnosis but presages an improved surgical outcome although. (Tyler et al., 2002).

There have been many hypothesis proposed on etio-pathogenesis of the neurological disorder. The most accepted theory is demyelination of the nerve resulting in short circuiting of impulses in the pathways of Trigeminal nerve. (Benoliel, Eliav, 2008; Merskey, Bogduk, 1994; Prasad, Galetta, 2009) In our study, we found that Trigeminal neuralgia involving right side of the face was more common than the left side and the mean
age of the patients was 50 years which was in accordance with the study conducted by (Cruccu et al., 2006; Katusic et al., 1990; Neto et al., 2005). Trigeminal neuralgia has been seen to be an extremely disabling illness but unfortunately the medical line of treatment does not give 100% relief and surgical approach has got its own inherited disadvantages, one of them being anesthesia on the involved side. Initially, administration of anticonvulsant drugs was the treatment of choice for trigeminal neuralgia. There are now a variety of other effective treatments, both pharmacologic and surgical. However, none of them provides a permanent cure. Anticonvulsants and antidepressants have demonstrated efficacy in improving neuropathic pain and positively impacting comorbid sleep and mood disturbances. (Castro et al, 2008; Siddiqui et al., 2003).

A careful evaluation of the history and the identification of the nerve involved are important in any case for an accurate diagnosis in patients suffering from trigeminal neuralgia. Ruling out the possibility of any neurovascular conflict in case of classic trigeminal neuralgia or an identifiable cause in case of secondary or symptomatic trigeminal neuralgia is necessary for providing an exacting treatment. Regular follow-ups are required to carefully evaluate the pain and the necessary steps that could be required to combat the psycho-social well-being of the patients afflicted with this chronic facial pain syndrome. For patients suffering from chronic pain where surgical or, pharmacological treatment have not provided sustained pain relief (or, the side effects associated with the pain relief are unacceptable), psychological approaches to pain management become the preferred option.

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