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A Study of Trigeminal Neuralgia: Special Reference to Painful Awakenings During Sleep

ABSTRACT

Context: Studies of TN in the Indian context are few; moreover, no study has evaluated the relation between sleep and TN. **Aims:** To study the clinical and laboratory features of Indian patients with trigeminal neuralgia (TN) with special reference to sleep. Settings and Design: Tertiary care setup **Methods and Material:** Patients fulfilling International classification of headache disorders-3 beta criteria for TN seen from January 2009 to December 2013 were included. Patients with secondary TN were excluded. Patients underwent detailed history and clinical examination. Particular attention was given to painful awakenings. Detailed MRI evaluations were performed with CISS sequences to study the trigeminal area. Medications required to control the pain were tabulated and analysed. **Results and Conclusions:** Fifty four patients were included in the study. The commonly observed female preponderance was not seen and V1 affection was far more common than previously documented. In spite of detailed evaluation, vascular loop was encountered in less than one fourth of patients. Exploring the relation between TN and sleep, significant number of patients (40%) with TN got up from sleep because of pain; which is much frequent than documented by most studies. All the patients who woke up from sleep due to pain had affection of V2, suggesting a role of tactile stimulation of V2 dermatome during sleep.

Key words: Trigeminal neuralgia, Sleep, Painful awakenings, Vascular loop

INTRODUCTION

Trigeminal neuralgia (TN) is one of the most painful conditions producing paroxysms of unilateral, recurrent, brief, stabbing, and severe pain along the distribution of trigeminal nerve. While various triggers such as shaving, washing face, chewing, touching or draft of air have been known to exacerbate the pain, it is believed that sleep has a favorable effect on TN and that the pain of TN rarely occurs in sleep.[1-5] There are very few studies of TN in the Indian context; moreover, no study has evaluated the relationship between sleep and TN. Hence, to study the characteristics of Indian TN patients and to evaluate the effects of sleep on pain, we carried out this study.

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SUBJECTS AND METHODS

Ours is a tertiary hospital. Patients with TN fulfilling the In-Home Supportive Services (ICHD-3 beta version) inclusion criteria seen over 5 years (2009–2013), were recruited. Patients with secondary TN were excluded from the study. Data were obtained regarding age at presentation, sex, distribution, and side of pain. Information was obtained regarding the pain of TN during sleep. They were asked about the severity of pain, was their sleep affected by TN, and if yes how frequently. They were asked specifically whether the cause of nocturnal awakenings was pain or not; and whether it was regularly disturbing their sleep or only as an occasional event. Patients who had more than 2 awakenings a day at least 2 times in a week were considered as having sleep disturbance due to TN. Detailed clinical examination was carried out by a single senior clinical neurologist, to study the sensory, motor and reflex functions of the trigeminal nerve and rest of the neurological examination was documented. All patients underwent magnetic resonance imaging (MRI) brain with constructive interference in steady state (CISS) protocol with MR angiography on 1.5 or 3Testa Philips machines to look for the presence of vascular loop on the side corresponding to the pain of TN and other abnormalities. Details of medications were studied.

RESULTS

Fifty-four patients fulfilled the inclusion criteria. Their demographic, clinical, and imaging data are shown in Table 1.

As shown in Table 1, TN was equally common in males and females and without any side preference. Pain was most common in V2 distribution, followed by V1 and V3. Vascular loop was seen in <1 fourth of patients.

Sleep and TN

Data were available in 35 patients. Table 2 shows the comparison of patients in whom sleep was disturbed as against those who did not have sleep disturbance due to pain. The night awakenings were reported by patients in the active phase of TN. As attacks in the day reduced, painful awakenings also became less frequent. Patients under good control did not experience night awakenings.

As shown from Table 2, the two groups did not differ significantly on any parameter. Here, we used the Fisher exact statistic test for calculating *P* value to assess the association between pain of TN and sleep.

Table 3 pain in the v2 distribution was more common in the patient group who experienced awakening (100% vs. 81%), but The Fisher exact test statistic value is 0.1334; hence, the result is not statistically significant at $P < 0.05$.

Here, [Table 4] it was seen that vascular loop was slightly more frequently found in patients with painful nocturnal awakening but the difference was not statistically significant. The Fisher exact test statistic value is 0.3782, not significant at $P < 0.05$.

The Fisher exact value for this observation is 0.4716, which is not again not significant at $P < 0.05$.

Table 1: Demographic, clinical, and imaging data (*n*=54)

M 30, F 24
Mean age: 56.3 years
Right and Left side: L=27/51, R=24/51
Distribution of pain: v1=26/49, v2=42/49, v3=16/49
Loop: Present=12 (3 SCA, 1 BA, 8 unnamed small vessels), absent =42

SCA-superior cerebellar artery, BA-basilar artery

Table 2: Sleep and trigeminal neuralgia

Painful awakenings present	Painful awakenings absent
n=14 (40%)	*n*=21 (60%)
Seven males, seven females	Twelve males, nine females
Mean age: 59 years	Mean age: 58 years
Loop present: 40%	Loop present: 33%
Pain in V2 distribution:100%	Pain in V2 distribution: 81%
Treatment: monotherapy=71%, two drugs=29%	Treatment: monotherapy=66%, two drugs= 20%, three drugs=14%

Table 3: Painful awakening in relation to nerve distribution

Characteristic	Painful awakening present	Painful awakening absent
Pain in V2 distribution	14	17
Pain in other distribution	0	4

Treatment

About 68% patients had good response with monotherapy (18 patients were on carbamazepine and 13 on gabapentin) [Table 5]. Average daily dose of carbamazepine of 600 mg and that of gabapentin was 400 mg. Ten patients were on two drugs (carbamazepine and gabapentin) and three were on three drugs (carbamazepine, gabapentin, and clonazepam). There was no significant difference in the treatment received in the two groups of patients who had painful awakenings from sleep and those who did not. For the 35 patients studied for sleep and TN association, Table 6 shows the proportion of patients on mono versus multidrug therapy.

The Fisher exact statistic value is 0.5428, not significant at $P < 0.05$. Thus, multidrug therapy has not much bearing on the incidence of painful nocturnal awakening.

DISCUSSION

The age at onset of TN in the present cohort matched other studies. While TN is known to be much more common in females (female:male=2:1) in the present study it was more common in males.[6] One more Indian study shows similar male preponderance; but the significance of this fact will need to be further established on larger Indian cohorts.[7] TN is more common on right side and such right side preference has been noted to be as high as 70%.[5,8] Narrow foramen rotundum and foramen ovale on right side are considered to be responsible

Table 4: Painful awakening in relation to the presence of vascular loop on magnetic resonance imaging

Vascular Loop	Painful awakening present	Painful awakening absent
Vascular loop present	40	33
Vascular loop absent	60	67

Table 5: Painful awakening in relation to gender

Sex distribution	Painful awakening present	Painful awakening absent
Female	7	9
Male	7	12
Marginal column total	14	21

Table 6: Mono versus multidrug therapy

Therapy	Painful awakening present	Painful awakening absent
Monotherapy	71	66
Multidrug therapy	29	34

for this occurrence. In the present study, TN was in fact slightly more common on left side. As Indian data on the comparative dimensions of these foramen are not available, this is a subject of further research.

TN is most common in V2 distribution, followed by V3 and only about 5% patients have pain in V1 distribution.[9] In our study, as expected, 85% patients had pain along V2 distribution. However, V1 involvement was noted to be very frequent (53%). This fact is therapeutically important as this large group would be unsuitable for radio-frequency ablation, if and when deemed necessary.

An aberrant loop of blood vessel is known to compress the entry zone of trigeminal nerve at the pons on Magnetic Resonance Angiography (MRA) in 60–90% patients with TN. Sensitivity of MRA to detect aberrant loop in TN ranges from 50% to 95%. In our study, only 22% patients had aberrant vascular loop compressing the trigeminal nerve. This percentage is much lower and is noteworthy as patients underwent MRI on 1.5 or 3 Tesla machine with specific CISS sequences looking for abnormalities in trigeminal nerve region.

Painful disorders such as migraine, tension headache, and fibromyalgia are known to decrease dramatically during sleep. Similarly, it is believed that painful paroxysms of TN rarely occur during sleep. However, 40% of patients of TN in the present study had frequent awakening from their sleep due to paroxysmal pain. This is in contrast to several previous studies which record that pain during sleep is rare.[1-5] One of the limitations of the data in the present cohort is the non-availability of the duration of active phase of the disease, which could have further helped this grouping. Analyzing the two groups of patients of TN with and without sleep disturbances, no significant difference in age, sex, and presence of vascular loop was noted. However, it was noteworthy that all patients with painful awakenings had pain along V2 division of trigeminal nerve. Although we could not establish statistically significant association between the two, we wonder whether this could be attributed to the V2 area being more prone to tactile stimulation during sleep.

Painful awakenings encountered in 40% of patients are important for therapeutic considerations. We wish to emphasize that the last dose of medicines should preferably cover the sleeping hours as well. While the observation that when day attacks subside, the night attacks also subside is applicable to the group, particularly for those who have painful awakenings in the night and have a V2 distribution of pain, dose adjustments may be more relevant. Comparing the therapy profile of those who had painful awakenings during sleep with those who did not, it was clear that the two groups did not differ significantly, suggesting that those who woke up due to pain did not have more severe form of TN.

CONCLUSION

In the present study, TN was equally common in males and females; without any side preference. Pain along V1 distribution was more common than previously described, making this large group unsuitable for potential radiofrequency ablative therapy. Aberrant vascular loop compressing the trigeminal nerve was uncommon, affecting <1 fourth of patients. Nocturnal awakenings from sleep due to pain were more frequently encountered than previously reported, emphasizing the requirement of night medication to cover the sleep time.

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