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Clinical correlation between tension headache, myofascial pain and occlusal disturbance in young adults a cross sectional study

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ABSTRACT

Context: Tension type headaches (TTH) are become quite common in the current times. These have become the cause of speculated migraine and get treated as the same with limited relief in the symptoms. This type of headache needs to be evaluated for Pericranial tenderness and association with myofascial pain. As per recent studies it is becoming increasingly clear that pericranial tenderness or tenderness in muscles of head and neck may manifest as migraine and tension type headaches.
Aims: To co-relate tension type headache with myofascial pain and occlusal discrepancies.
Design: Cross sectional study.
Materials and Methods: Forty six patients suffering from TTH were enrolled in the study and were examined for myofascial and pericranial tenderness and the same was correlated with occlusal disturbances. The data obtained was then statistically evaluated using the chi square test.
Results: A significant co relation between Tension type headache and muscle tenderness and various parameters included was seen in our study which may also be related to malocclusion and occlusal discrepancies.
Conclusions: Clinical co-relation can be established between TTH, myofascial pain and malocclusion. Patients with malocclusion are likely to develop myofascial pain and associated tension type headache.
Key Messages: Tension Headache or migraine is not the only cause of headache, as postulated frequently, there may be other reasons too for the same. Pericranial tenderness needs to be evaluated and considered as one of the etiology for headache and needs to be treated accordingly.

1. Introduction

Primary headaches have increasingly become a matter of concern as there is an upsurge of this disorder among the population all over the world.[1] The International Headache Society (HIS) broadly classified headache as primary, secondary, cranial neuralgias and central or peripheral causes of facial pain and other headaches (Table 1).[2] The global burden of disease study 2010(GBD2010) have found tension type headache (TTH) and migraine to be 2nd and 3rd most prevalent disorder worldwide.[3] The term tension type headache was coined by first classification committee of International Headache society.[4] In a study conducted on the south Indian population the prevalence of TTH was found to be 35.1% with a highest prevalence among the younger population (40.1%).[5] TTH is commonly found to be associated with stress, however several studies relate it to be muscular in origin. TTH is a featureless headache characterised by pain in the head and is diagnosed by excluding features of other types of headaches such as migraine.[6]

TTH can last from thirty minutes to several days and can be continuous in severe cases. The pain is mild or moderately intense and is described as tightness pressure or dull ache. The pain is usually experienced bilaterally as a band extending from the forehead across the sides of the head to the occiput and posterior neck muscles. Physical activity does not increase the intensity of the tension

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headache in contrast to migraine, wherein physical activity worsens the pain. Patients may present with photophobia or phonophobia occasionally. In the study conducted by Langemark et al to characterise the symtoms of Tension Type Headache 13% were found to develop symtoms of photophobia and 7% reported of phonophobia.[7]

Palpation of the head in patients with TTH reveals tenderness in pericranial muscles and tension in the nuchal musculature or trapezius.[8,9]

Studies show that active myofascial trigger points (MTrPs) elicit referred pain producing headache pattern in patients with TTH.[10–12] Thus, speculations that myofascial structures may be associated with TTH.

2. Aim and Objective

1. To co-relate the occurrence of Myofascial pain and occlusal disturbances in patients with TTH.
2. To evaluate presence of MTrPs in muscles of mastication, head and neck muscles in patients with TTH
3. To evaluate occlusal disturbances (missing teeth, malocclusion, wasting disorders, occlusal facets etc) in patients with TTH.
4. To assess parafunctional habits in these patients.
5. To evaluate the occurrence of MTrPs and TTH among males and females.

3. Materials and Methods

A cross sectional study was carried out and patients were randomly evaluated in the OPD of Department of Oral Medicine and Radiology. A total of 120 patients were evaluated of which 46 patients i.e. 23 males and 23 females aged 18 -35yrs were enrolled in this study. Other than their dental complaints these 120 patients were also asked for complaints of headache of more than six months duration which was not diagnosed and been treated with over the counter drugs. These patients were then referred to the neurology department for further diagnosis of their symptoms of headache and the ones diagnosed with TTH were included in the study i.e.46 of the 120 patients fulfilled the inclusion criteria and were enrolled in the study.

Ethical approval for this study (IREB/2020/OMDR/01) was provided by the Ethical Committee (Institutional Research and Ethical Board) on 02 March 2020. All patients signed an informed consent before their inclusion.

3.1. Inclusion criteria

1. Young adults aged 18-35years.
2. Patients having symptoms of headache for more than six months.
3. Patients diagnosed with tension type headache.

3.2. Exclusion criteria

1. Patients with H/o psychological disorder and being treated for the same.
2. Patients with H/O spondylosis and other spinal disorder.
3. Patients being treated for migraine, cluster headache etc.
4. Patients with history of head injury.
5. Patients with past history of brain infection.
6. Patients with hypertension/hypotension.
7. Patients with H/o Hypoglycaemia.
8. Patients suffering from acute or chronic sinusitis.
9. Patients suffering from cold/cough.
10. Patients addicted to alcohol.
11. Patients with H/O Hyperacidity.

Patients diagnosed with tension type headache were included in the study. These patients were then evaluated for pain in the myofascial region. Their muscles of mastication and head and neck muscles were palpated for trigger points both active and passive and painful symptoms were evaluated on a VAS scale. These patients were also evaluated for malocclusion or occlusal discrepancies like missing teeth, generalized wasting disorders, occlusal facets and plunger cusps, loss of anterior and canine guidance. The number of tender muscles were recorded as well as the occlusal discrepancies and the data was tabulated. Statistical evaluation was carried out using chi square test. And the level of significance was established at 0.3 (p value).

4. Results

4.1. Gender distribution

Forty-six patients diagnosed with TTH were included in the study of which 23 were males and 23 females (Table 2).

4.2. Muscle tenderness

Of the 46 patients who complained of tension headache almost all the patients had trigger points on one or more than one muscle. 23 individuals (50%) showed MTrPs in temporalis muscle of which 13 were males and 10 were females. 21 patients showed tender MTrPs in masseter muscle (9 males and 12 females) On functional palpation 12 subjects (26.1%) complained of pain in medial pterygoid and 25 (54.3%) subjects had tender lateral pterygoid. 33 individuals (71.7%) had MTrPs in sternocleidomastoid 30 individuals (65.2%) had tender MTrPs in trapezius muscle (Table 3). However, none of these values were found to be of statistical significance. But most of the patients complaining of headache had tender trigger points on sternocleidomastoid muscle and trapezius muscle.

4.3. Malocclusion and occlusal discrepancies

On evaluation of the occlusion it was found that of the 46 patients 39 (84.7%) had Angle's class I malocclusion, 5 (10.8%) were diagnosed with class II malocclusion and 2 (4.3%) had class three malocclusion (Table 4). The statistics shows a significant co-relation between angles II malocclusion and tension type headache.

All the 46 subjects showed some form of occlusal discrepancies in the form of excessive overjet or over bite, deep bite, spacing of teeth, crowding of teeth, proclined teeth, crossbite etc the distribution of the same is provided in the Table 5.

4.4. Parafunctional habits

17 patients (37%) having tension headache were found to be having parafunctional habits of either nail biting, bruxism, clenching or grinding. 25 of the 46 patients also reported of unilateral chewing habit (Tables 6 and 7).

It was also noted that all the subjects who were examined followed a sedentary lifestyle.

5. Discussion

According to Fricton, headache determines an increased central sensitization to pain and an exacerbation of pain symptoms in the craniocervical mandibular joint. This motivates the patient to seek help for headaches rather than myofascial pain. Headaches can have a myofascial as well as a vascular component often termed as a mixed variety of headache. So even if the headache has been treated the trigger points will still be left back to exacerbate the pain.[13]

In our study we found that all our subjects who suffered from tension type headache had at least one or more muscles of the head, face and neck region which were tender to palpation or had active or latent trigger points present. As mentioned earlier tension type headache maybe referred pain from the neck and shoulder muscles. This is underpinned by a study in which hypertonic saline was injected into the anterior or posterior temporalis muscles to induce experimental pain in healthy individuals. These individuals perceived this as head pain. Similar evidence has been obtained for upper trapezius muscle.[14]

In the present study 70% patients complaining of TTH had TrPs in trapezius and sternocleidomastoid muscles as against the other muscles of mastication. These TrPs may be responsible for referred pain in the temporal and occipital region mimicking headache. New researches point toward myofascial trigger points which may be active or latent palpable nodules within taut band of skeletal muscle that are hypersensitive to compression, responding to local twitch response or familiar referred pain that cause headaches. Referred pain evoked by active trigger points in the cervicocranial region reproduces at least part of the pain pattern experienced during headache attacks.[15] Whereas referred pain evoked by mechanical stimulation of latent trigger points does not reflect a usual or familiar headache pattern. Similarly, when there were active trigger points patients have greater headache intensity and frequency and longer duration of headache than those with latent trigger points.[16] Our study fails to point out whether the TrPs were active or latent which is a shortfall of the study.

5.1. Occlusal interferences and malocclusion

It has been suggested that occlusal disharmonies contribute to condylar displacement and occlusal avoidance patterns, and both can contribute to abnormal proprioceptive input and sustained muscle contraction in an attempt to correct the poor occlusal relationships. Studies also show long term masticatory hyperactivity of masticatory muscles caused by faulty occlusion can lead to muscle pain. Thus, tenderness in head and neck muscles caused due to prolonged contraction can be perceived as headache. Thus, treatment of tender muscles of head and neck region should help relieve headache in patients with cTTH.[17]

In our study the subjects who had tension headache also had some or the other form of occlusal discrepancies in form of increased overjet, overbite, deep bite, crowding, proclination, spacing etc and all the patient also had TrPs in head and neck muscles. As per literature a non-harmonious relationship between occlusion, muscles and the temporomandibular joint may be perceived as pericranial tenderness or headache. Graff-Radford contends that TMD elicit or exacerbate headache because of an overlap of innervations with the trigeminal nerve. As previously stated, the trigeminal nuclei for mechanoreceptive, proprioceptive, and pain sensations are in close proximity.[18]

Karppinen et al along with physiotherapists investigated occlusal adjustment for the treatment of chronic neck and headaches over a period of 60 months. After providing occlusal adjustments they concluded that the occlusal adjustments were efficient in 80% of the cases with also reduction in head and neck pain during movement and hence concluded that occlusal adjustment can be effective in treatment of chronic neck pain and headaches.[19]

5.2. Parafunctional habit

Parafunctional oral habits such as bruxism and clenching and nail biting can be a way of tension release as well as a learned behavioural response. Some patients with these problems show an inability to verbalize anger hostility or anxiety and as stress increased an increase in the contraction of masticatory musculature through these habits produce trigger points and pain.[20]

In our study a total of 17 out of 46 subjects had parafunctional habits such as nail biting, bruxism, clenching or grinding their teeth although this was not co related

Table 1: The International Classification of Headache Disorders (2nd ed.)

	Part. 1 Primary Headache Disorders
1	Migraine
2	Tension- type headache (TTH)
3	Cluster Headache and other Trigerminal autonomic cephalalgias (TAC)
4	Others Primary Headaches
	Part. 2 Secondary Headache Disorders
5	Headache Attributed to head and/or neck trauma
6	Headache Attributed to cranial or cervical vascular disorder
7	Headache Attributed to nonvascular intracranial disorder
8	Headache Attributed to substance or its withdrawal
9	Headache Attributed to infection
10	Headache Attributed to infection
11	Headache or facial pain attributed to disorder of cranium. Neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cranial structures
12	Headache Attributed to psychiatric disorder
	Part. 3 Cranial neuralgias and central or Peripheral causes of facial pain and others headaches
13	Cranial neuralgias and central or peripheral causes of facial pain
14	Other headache, cranial neuralgia, central or primary facial pain

Table 2: Gender distribution

Gender	Number	Percentage
Males	23	50.0%
Females	23	50.0%

Table 3: Muscle tenderness

	Males		Females		Total		Chi square, p
	No.	%	No.	%	No.	%	Males v/s females
Temporalis	13	56.5	10	43.2	23	50.0	0.766, 0.3816
Masseter	9	39.1	12	52.2	21	45.7	0.771, 0.3798
Medial pterygoid	6	26.1	6	26.1	12	26.1	0.000, 1,000
Lateral pterygoid	14	60.9	11	47.8	25	54.3	0.766, 0.3816
SCM	15	65.2	18	78.3	33	71.1	0.771, 0.3798
Trapezius	13	56.5	17	73.9	30	65.2	1.500, 0.2207

Table 4: Angles malocclusion

	Males		Females		Total		Chi-square, p
	No.	%	No.	%	No.	%	Males v/s Females
Class I	20	87.0%	19	82.6%	39	84.8%	0.165, 0.6847
Class II	2	8.7%	3	13.0%	5	10.9%	0.220, 0.0689
Class III	1	4.3%	1	4.3%	2	4.3%	0.000, 1.000

Table 5: Occlusal discrepancies

	Males		Females		Total		Chi-Square, p
	No.	%	No.	%	No.	%	Males v/s Females
Overjet	1	4.3%	4	17.4%	5	10.9%	1.976, 0.1599
Deep bite	4	17.4%	4	17.4%	8	17.4%	0.000, 1.000
Proclination	5	21.7%	5	21.7%	10	21.7%	0.000, 1.000
Crowding	3	13.0%	2	8.7%	5	10.9%	1.976, 0.1599
Crossbite	2	8.7%	1	4.3%	3	6.5%	0.220, 0.0689
Open bite	2	8.7%	2	8.7%	4	8.7%	0.000, 1.000
Spacing	2	8.7%	2	8.7%	4	8.7%	0.000, 1.000
Increased vertical height	0	0.0%	1	4.3%	1	2.2%	0.000, 0.3173

Table 6: Parafunctional habits

	Males		Females		Total		Chi-Square
	No.	%	No.	%	No.	%	Males v/s Females
Nail-biting	7	30.4%	4	17.4%	11	23.9%	1.052, 0.150
Clenching	3	13.0%	1	4.3%	4	8.7%	1.071, 0.151
Bruxism	0	0.0%	1	4.3%	1	2.2%	0.000, 0.3173
Grinding	0	0.0%	1	4.3%	1	2.2%	0.000, 0.3173

Table 7: Chewing habits

	Males		Females		Total		Chi- Square
	No.	%	No.	%	No.	%	Males v/s Females
Unilateral	8	34.8%	17	73.9%	25	54.3%	6.943, 0.0084
Bilateral	15	65.2%	6	26.1%	21	45.7%	6.943, 0.0084

with stress or anxiety in these patients. Several studies have showed a correlation between frequency and intensity of headache and presence of TMDs which also show tenderness in muscles of mastication. According to Carlo di Paolo et al (2017) headache makes pain parameters more intense and frequent, complicating dysfunctional diseases both in diagnostic and treatment phase.[21]

According to Ciancaglini and Radaelli they suggested that 70% of headache patients also had clinical confirmation of TMD and vice versa.[22] According to Cesar Fernandez – de- las – penas 2011, a study conducted on children and adolescents demonstrated that there was tenderness in muscles of the temporalis, masseter and sternocleidomastoid i.e. they acted as trigger points in children with tension headache.[11]

6. Conclusion

To conclude in our study, it was observed that all patients who experienced TTH also had tender muscles of head and neck region which co-existed with occlusal disharmony and parafunctional habits, thus establishing a correlation between myofascial pain and tension type headaches. When the equilibrium between the muscles of the head, face neck, occlusal harmony and temporomandibular joint is not maintained these can lead to chronic conditions and develop TrPs which in turn can be perceived as pericranial tenderness or headache. Hence patients with headache should also be evaluated for tenderness of muscles in the pericranial region. Despite an obvious lack of a well-designed longitudinal study that irrefutably confirms the relationship between headache progression, muscle tenderness and occlusal discrepancies, a clinical correlation can be seen. Accordingly, a multidisciplinary approach towards these patients is necessary to improve diagnosis and treatment.

7. Source of Funding

None.

8. Conflict of Interest

The authors declare that there is no conflict of interest.

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