

ARE MIGRAINE AND TENSION-TYPE HEADACHE DIFFERENT CONDITIONS?

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INTRODUCTION

The classification of Primary Headaches, of which migraine, tension-type headache, and a combination of the two comprise over 95%, has been a contentious issue for many years. The first concerted attempt at headache classification was published in the Journal of the American Medical Association in 1962. It was compiled by the 'Ad Hoc Committee on Classification of Headache', which was comprised of six of the most pre-eminent neurologists in the United States at that time. The classification was arbitrarily based on the available "experimental and clinical data, *together with reasonable inference*".¹ It reflected, in the main, the accumulated clinical experience of these pre-eminent experts in the field of headache study and treatment. It was hoped that the classification would provide a 'logical approach to the planning of therapeutic trials'.²

The Ad Hoc Committee divided headache into 15 categories, of which Primary Headaches were the first three, namely "Vascular Headache of the Migraine Type", "Muscle Contraction Headache", and "Combined Headache: Vascular and Muscle Contraction". This distinction between vascular headaches on the one hand, and muscle contraction headache on the other, has been perpetuated in both the first² and second³ International Headache Society (IHS) classification of headaches. The first two categories in the widely accepted IHS classification are entitled "Migraine" (MI), and "Tension-Type Headache" (TTH). The majority of patients suffering from Primary Headaches are classified under these two headings or a combination thereof.

Although the Ad Hoc Committee stated that experimental data was used, no reference is made as to what experimental data influenced the classification. There was then, and still is, a paucity of experimental data available to assist in making a clear distinction between different types of Primary Headache⁴. The aetiology and pathogenesis of Primary Headache was, and still is, poorly understood^{2,5}, and the clinical diagnosis of Primary Headache type is still based on patterns of symptoms⁶ which have been arbitrarily assigned to particular headache types.

There is however another viewpoint – that migraine and tension-type headache are not distinct clinical entities, but that they form part of a continuum. The concept was possibly first proposed by Waters⁷ who based his theory on the epidemiologic observation that the occurrence of aura, unilateral location, and nausea in headache sufferers linearly increased with headache intensity. Waters suggested that his "survey raises the important possibility that migraine might be an extreme in a continuum rather than a distinct clinical entity which the patient either has or has not got". He went on to say "The implications are important from the point of view of treatment as, if migraine is a separate entity, there may be specific pharmacological agents for its treatment". The development of the triptans was an attempt to develop just such specific agents for the treatment of migraine. Notwithstanding the widespread use of the triptans as migraine "wonder drugs", the results of triptan therapy fall far short of what would be expected of a tailor-made drug. The most comprehensive meta-analysis of the triptans to date, which included 53 clinical trials involving 24,089 patients, showed that the average placebo-subtracted 2 hour pain-free rate with triptan use over three migraine attacks was only 20%. If there were only one pathophysiological process common to all migraine sufferers, the response rate to a drug specially designed to abort that process

would be expected to be far higher. In addition, the fact that the triptans are as effective (or ineffective) in TTH as in MI,⁸ indicates the presence of similar processes in the pathophysiology of MI and TTH.

Symptoms Common to both MI and TTH

MI and TTH have many symptoms in common.^{9,10} Both MI and TTH sufferers may have symptoms such as moderate pain, nausea, photophobia, and phonophobia. As these common symptoms are important criteria in the classification, the distinction between MI and TTH cannot be based on individual symptoms. It is based rather on the pattern and severity of symptoms.

The main criteria utilised in the IHS Classification for the differentiation between MI and TTH are listed in Table I.

A Number of attacks

Migraine	At least 5 attacks ^{2,3} .
Tension-type headache	At least 10 attacks ^{2,3} .

There is no explanation or rationale as to how the respective committees decided upon how many attacks one should experience before the headache was officially called a primary headache! If one experiences three or four attacks of headache that conform in all other respects to for example, migraine plus aura, then by definition, the painful episodes can not be classified as migraine!

B Duration of Attacks

If the pain lasts between 30 minutes and 7 days, it may be TTH, and if it lasts between 4 and 72 hours, then it may be MI. This is purely a thumb-suck definition and has no scientific basis at all! And to make it even more confusing, according to the classification either may last between 4 and 72 hours.

C Pain characteristics

Location.

Historically, unilateral pain is more commonly associated with MI, and bilateral pain with TTH². Numerous studies have shown, however, that the frequency of unilateral as opposed to bilateral pain is similar in MI and TTH, and that the location of the pain cannot be used as a reliable criterion for distinguishing MI from TTH¹¹⁻¹⁵.

Pulsatile nature.

Pulsating pain is listed as usually associated with MI, and not with TTH. The IHS Classification specifically excludes pulsatile pain as one of the characteristics of TTH. In one study though, 40% of both MI and TTH sufferers experienced pulsating pain.⁷ This finding was confirmed by Olesen, who found that only 47% of 750 MI sufferers had pulsating pain.¹⁴

Intensity.

Mild pain is indicative of TTH, and severe pain indicates that the condition is MI. But both TTH and MI sufferers may experience m. Unfortunately there is no objective way of determining pain severity, so this distinction is based on purely subjective information from the patient. Furthermore, patients with more severe pain more frequently experience those symptoms commonly associated with MI, and MI symptoms became more frequent if the intensity of the pain became more severe. This phenomenon was, however, observed in both MI and TTH.^{7,15,17,18}

Effect of physical activity on the pain.

There is no evidence in the literature of a relationship between MI, TTH, and the effect of physical activity on headache.

D Associated Symptoms

Nausea, vomiting, and visual disturbances. The frequency of occurrence of these symptoms is similar in MI and TTH, although they do occur more frequently as pain intensity increases.^{7,14,15,18} At the 1st meeting of the Chronic Daily Headache International Study Group in Rome in 2003, it was revealed that there had been heated debate around the issue of nausea. It was decided that if there was mild nausea, then the headache was most likely TTH, and if the nausea was moderate or severe, then it indicated migraine. When I asked the committee how one could scientifically distinguish the severity of nausea, they admitted that there was no possible way of accurately distinguishing mild nausea from moderate nausea.

The above criteria used to distinguish MI from TTH have absolutely no scientific basis. Consequently there exists a ludicrous state of affairs, where almost every clinical trial to test headache medication in the last twenty or thirty years has been based on an artificial, arbitrary, and meaningless system of classification. In all other aspects, clinical trials are subject to the most rigorous scientific scrutiny, and may be rejected for the slightest deviation from the accepted strict scientific protocols. Unfortunately, the fact that their subjects have been selected according to an arbitrary and completely unscientific classification must raise serious doubts as to their scientific value!

Chronic Daily Headache (CDH)

CDH refers to the headache disorders experienced by people with very frequent headaches (15 days or more per month). This includes those with Medication Overuse Headache (MOH). According to studies in the United States, Europe, and the East, between 4% and 5% of the general population have primary CDH,¹⁹⁻²¹ and 0.5% have severe headaches on a daily basis.²²⁻²⁴ CDH is a disorder with features of both MI and TTH, and is commonly seen in headache centres. Because of the overlap of symptoms, it is frequently difficult to classify - in one study, 36% of a clinic based sample of 410 headache patients could not be classified according to the IHS criteria because of the overlap of symptoms.²¹ The overlap between MI and TTH is highlighted by the fact that CDH may start as MI, and develop into CDH, or it may start as TTH and develop into CDH.²³⁻²⁶

This coexistence of MI and TTH does not support the existence of separate, distinct, primary headache entities.

Experimental Data Supporting Continuum Concept

There is a wealth of published evidence supporting the concept that MI and TTH are varying intensities of the same disorder.

Symptom homogeneity. In five studies^{7,9,14,16,29} it was found that patients classified as suffering from MI and TTH experienced the same symptoms, but that the MI patients had more symptoms of both MI and TTH than those with TTH. Featherstone (1985) concluded "idiopathic headaches vary in symptom quantitation, and symptom quantitation does not show different headache entities".

Vasomotor studies. Vasomotor studies have shown that vascular changes are present in TTH as well as in MI.^{28,30} Drummond and Lance went as far as to state that "Vascular changes may yet prove to be of greater relevance to tension headache than is the state of muscle contraction".³¹

Pericranial muscle tenderness. Both MI and TTH are characterised by muscle tenderness during headaches.^{13,27,28}

EMG activity. Average frontalis EMG activity is higher in TTH than in controls, and higher in MI than in TTH¹⁴. Both MI & TTH patients have higher neck EMG activity than controls. Neck tightness was the most frequent symptom of both MI & TTH.¹⁴

Biofeedback. Biofeedback techniques such as frontalis EMG training and skin-temperature training were found to be equally effective in treating both MI and TTH.^{14,28,32}

Pulse velocities. Superficial temporal pulse velocities showed similar patterns for both MI and TTH groups. Both groups showed decreased pulse velocity in response to noise, while in the control group, pulse velocity increased.¹⁴

Personality differences. Personality differences between MI and TTH have not been consistently demonstrated and seem to be of little importance.³²⁻³⁵

Conclusion

The arbitrary classification of MI and TTH as separate entities has been challenged by a number of authors.^{15,16,29,36} There is, on the other hand, a great deal of experimental evidence^{7,9,13,14,16,27-29,30-35,37-39} that MI and TTH form part of a continuum, and differ only in the severity of the symptoms experienced. The IHS classification of primary headaches into artificial groupings is arguably the single most important hindrance to advancing our understanding of Primary Headaches. Until it is scrapped, and a new classification based on hard scientific evidence is developed, headache researchers are destined to continue their futile search for effective headache drugs – they may as well be looking for the Philosopher's stone.

<u>MIGRAINE</u>	<u>TENSION-TYPE HEADACHE</u>
<p>A At least 5 attacks fulfilling B, C, & D</p> <p>B Headache attacks lasting 4-72 hours (Untreated or unsuccessfully treated).</p> <p>C Headache has at least 2 of the following characteristics</p> <ol style="list-style-type: none"> 1. Unilateral location. 2. Pulsating quality. 3. Moderate or severe intensity (Inhibits or prohibits daily activities). 4. Aggravated by walking up stairs or similar routine physical activity <p>D During the headache at least one of the following:</p> <ol style="list-style-type: none"> 1 Nausea and/or vomiting 2 Photophobia and phonophobia 	<p>A At least 10 previous headache episodes fulfilling criteria B, C, & D.</p> <p>B Headache lasting from 30 minutes to 7 days.</p> <p>C At least 2 of the following pain characteristics:</p> <ol style="list-style-type: none"> 1. Bilateral location. 2. Pressing/tightening (non-pulsating) quality. 3. Mild or moderate intensity (may inhibit, but does not prohibit activities). 4 No aggravation by walking up stairs or similar routine physical activity. <p>D Both of the following:</p> <ol style="list-style-type: none"> 1 No nausea or vomiting (anorexia may occur). 2 Photophobia and phonophobia are absent, or one but not the other is present.

Table I. International Headache Society criteria for the differentiation between “Migraine” and “Tension-Type Headache”.

References

1. Ad Hoc Committee on Classification of Headache. Classification of Headache. *JAMA* 1962; 179: 127-128
2. The Headache Classification Committee of The International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgias, and facial pain. *Cephalalgia* 1988; 8 (Suppl 7): 1-93.
3. The Headache Classification Committee of The International Headache Society. The International Classification of Headache Disorders, 2nd Edition. *Cephalalgia* 2004; 24 (Suppl 1): 1-160.
4. Bakal DA. Headache. In: Woody RH, ed. *Encyclopaedia of Clinical Assessment*. San Francisco: Jossey-Bass, 1980: 72.
5. Mosek A, Novak V, Opfer-Gehrking TL, et al. Autonomic dysfunction in migraineurs. *Headache* 1999; 39: 108-117.
6. Silberstein SD, Lipton RB, Solomon S, et al. Classification of daily and near-daily headaches: proposed revisions to the IHS criteria. *Headache* 1994; 34; 1-7
7. Waters WE. The epidemiological enigma of migraine. *Int J Epidem* 1973; 2: 189-194.
8. Cady RK, Gutterman D, Saiers JA, Beach ME. Responsiveness of non-IHS migraine and tension-type headache to sumatriptan. *Cephalalgia*. 1997 Aug; 17(5): 588-90.
9. Thompson JK, Haber JD, Figueroa JL, et al. A replication and generalisation of the "psychobiological" model of headache. *Headache* 1980; 20: 199-203.
10. Allen RA, Weinmann RL. The McGill Melzack Pain Questionnaire in the diagnosis of headache. *Headache* 1982; 22; 20-29.
11. Phillips C. Tension headaches: Theoretical problems. *Behav Res Ther* 1978; 16: 249-261
12. Selby G, Lance WJ. Observations on 500 cases of migraine and allied vascular headache. *J Neurol Neurosurg Psychiat* 1960; 23: 23-32.
13. Olesen J. Some clinical features of the acute migraine attack: an analysis of 750 patients. *Headache* 1978; 18: 268-271.
14. Bakal DA, Kaganov JA. Muscle contraction and migraine headache: psychophysiologic comparison. *Headache* 1977; 17: 208-215.
15. Waters WE. The Pontyprydd headache survey. *Headache* 1974; 14: 81-90.
16. Featherstone HJ. Migraine and muscle contraction headaches: a continuum. *Headache* 1985; 25:194-198.
17. Ziegler DK, Hassanein RS, Couch JR. Characteristics of life headache histories in a non-clinic population. *Neurology* 1977; 27: 265-269.
18. Saper J. Daily Chronic Headache. *Neurol Clin* 1990; 8: 891-901.
19. Solomon S, Lipton RB, Newman LC. Evaluation of chronic daily headache – comparison to criteria for chronic tension-type headache. *Cephalalgia* 1992; 12: 365-368.
20. Sanin LC, Mathew NT, Bellmyer LR, Ali S. The International Headache Society (IHS) headache classification as applied to a headache clinic population. *Headache* 1993; 33(5); 266.

21. Messinger HB, Spierings ELH, Vincent AJP. Overlap of migraine and tension-type headache in the International Headache Society classification. *Cephalalgia* 1991; 11: 233-237.
22. Pfaffenrath V, Isler H. Evaluation of the nosology of chronic tension-type headache. *Cephalalgia* 1993; 13(suppl 12): 60-62.
23. Sandrini G, Manzoni GC, Zanferrari C, Nappi G. An epidemiological approach to the nosography of chronic daily headache. *Cephalalgia* 1993; 13(suppl 12): 72-77.
24. Mathew NT. Transformed migraine. *Cephalalgia* 1993; 13(suppl 12): 78-83.
25. Manzoni GC, Micieli G, Granella F, Martignoni E, Malferrari G, Nappi G. Daily chronic headache: classification and clinical features. Observation on 250 patients. *Cephalalgia* 1987; 7(suppl. 6): 169-170.
26. Manzoni GC, Sandrini G, Zanferrari C, Ferri AP, Granella F, Nappi G. Clinical features of daily chronic headaches and its different subtypes. *Cephalalgia* 1991; 6(suppl. 11): 290-293.
27. Tfelt-Hansen P, Lous I, Olesen J. Prevalence and significance of muscle tenderness during common migraine attacks. *Headache* 1981; 21: 49-54.
28. Cohen MJ. Psychophysiological studies of headache: is there similarity between migraine and muscle contraction headache? *Headache* 1978; 18: 189-196.
29. Kaganov JA, Bakal DA, Dunn BE. The differential contribution of muscle contraction and migraine symptoms to problem headache in the general population. *Headache* 1981; 21: 157-163.
30. Olesen J, Lauritzen M, Tfelt-Hansen P, et al. Spreading cerebral oligoemia in classical- and normal blood flow in common migraine. *Headache* 1982; 22: 242-248.
31. Drummond PD, Lance JW. Extracranial vascular reactivity in migraine and tension headache. *Cephalalgia* 1981; 1: 149-155.
32. Werder DS, Sarjent JD, Coyne L. MMPI profiles of headache patients using self-regulation to control headache activity. *Headache* 1981; 21: 164-169.
33. Andrasik F, Blanchard EB, Arena JG. Cross-validation of the Kudrow-Sutkus MMPI Classification system for diagnosing headache type. *Headache* 1982; 22: 2-5.
34. Kudrow I, Sutkus BJ. MMPI pattern specificity in primary headache disorders. *Headache* 1979; 19: 18-24.
35. Sternbach RA, Dalessio DJ, Kunzel M, et al. MMPI patterns in common headache disorders. *Headache* 1980; 20: 311-315.
36. Ziegler DK, Hassanein RS, Couch JR. Headache syndromes suggested by statistical analysis of headache symptoms. *Cephalalgia* 1982; 2: 125-134.
37. Muck-Seler D, Deanovic Z, Dupelj M. Platelet serotonin (5HT) and 5-HT releasing factor in plasma of migranous patients. *Headache* 1979; 19: 14-17.
38. Rolf LH, Wiele G, Brune GG. 5-hydroxytryptamine in platelets of patients with muscle contraction headache. *Headache* 1981; 21: 10-11.
39. Schade AJ. Quantitative Assessment of the Tension-Type Headache and Migraine Severity Continuum. *Headache* 1997; 37: 646-653.