

## A Clinical Study of Chronic Headaches: Clinical Characteristics and Depressive Trends in Migraine & Tension-Type Headaches

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**Background & Objectives:** Chronic headache is commonly encountered in the neurology outpatient clinic and it is often associated with depression. In Korea, however, chronic headache has not yet been systematically investigated. We conducted this study to investigate this clinical characteristics and level of depression in patients who presented migraine, tension-type headache, or transformed migraine.

**Method:** Among those with chronic headache during the period from January 1 1994 through December 31 1994, 131 patients were diagnosed to have either migraine, tension-type headache (by IHS classification), or transformed migraine: migraine in 60 patients, tension-type headache in 49 patients, and transformed migraine in 22 patients. Beck Depression Inventory (BDI) was performed in 116 of the 131 patients.

**Results & Conclusion:** There was no significant difference in the age of onset, duration of headache, and family history among the three groups. However, patients with migraine had a more severe, unilateral, and throbbing characteristic pain than those with a tension-type headache. The mean BDI scores in the transformed migraine and the tension-type headache patients were significantly higher than those of migraine, but the level of depression did not correlate with the patient's age, duration, character, severity, and frequency of headache. These findings suggest that migraine, tension-type headache and transformed migraine may be considered clinically distinct entities in viewing their different clinical characteristics and level of depression.

**Key Words:** Migraine, tension-type headache, depression

The chronic primary headache disorders are by far the most common chronic pain syndrome which are encountered in the neurology outpatient clinic. Migraine and tension-type headaches are the most common and impor-

tant headache syndromes, which sometimes interfere with daily activities. However, their clinical characteristics and prevalence have rarely been documented, especially in Korea.

The co-occurrence of migraine and tension-type headache symptoms are commonly reported by patients. However, physicians usually record a single diagnosis of either migraine or tension-type headache. Depression and headache are also strongly associated (Diamond, 1983; Breslau, 1994). Not only are chronic headache sufferers frequently depressed but headache is the most common somatic symptom of depressed patients (Diamond, 1983). Clinical diagnosis of headache syndrome can be difficult. Therefore accurate headache di-

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agnosis is important to the physician in clinical practice and is essential to ensure proper treatment. Until 1988, the diagnosis of the Ad Hoc committee (1962) had been used, but it was found to be vague and too general. The operational criteria proposed by the Classification Committee of the International Headache Society (Headache classification committee of IHS, 1988) are more specific and clear. However, it has many practical problems in clinical application (Silberstein *et al.* 1994) for there are a large subset of patients with transformed migraine and chronic daily headache who do not meet the classification criteria (Silberstein *et al.* 1994).

The pathogenic mechanisms of migraine and tension-type headache are still controversial. Migraine and tension-type headache have long been considered distinct entities (Headache classification committee of IHS, 1988; Rasmussen *et al.* 1992). However, it is still unknown whether tension-type headache is a milder form of migraine or if it is a distinct entity. Some clinicians and epidemiologists believe that migraine and tension-type headaches represent ends of a nosologic spectrum and are not distinct entities (Featherstone, 1985). As headache frequency increases, the clinical distinction between migraine and tension-type headache becomes blurred. Some headaches occur daily or almost every day with occasional full-blown migraine attacks (Sheftell, 1992). The clinical syndrome of a headache with characteristic natural history and association with depression is called "transformed migraine", originally described by Mathew *et al.* (1982). We tried to compare the clinical characteristics and level of depression between chronic headache patients with migraine, tension-type headache, and transformed migraine to see whether they should be regarded as distinct entities or as part of a continuum.

## METHODS

This study was done prospectively to evaluate chronic headache patients seen at the

**Table 1. International headache society diagnostic criteria (Headache classification committee of IHS, 1988)**

1. Migraine
A. At least 5 attacks fulfilling criteria below
B. Duration 4~72 hours
C. At least 2 of the following:
1. Unilateral location
2. Pulsating quality
3. Moderate to severe intensity(inhibits or prohibits daily activities
4. Aggravation by routine physical activity, such as walking stairs
D. At least 1 of the following:
1. Nausea and/or vomiting
2. The combination of photophobia and phonophobia
2. Tension-type
A. At least 10 attacks fulfilling criteria below
B. Duration 30 minutes to 7 days
C. At least 2 of the following:
1. Bilateral location
2. Nonpulsating pain
3. Mild to moderate intensity(may inhibit but not prohibit activities)
4. No aggravation by continuing routine activities
D. Both of the following:
1. No nausea or vomiting(anorexia may occur)
2. Either photophobia or phonophobia alone, but not the combination; or absence of both photophobia and phonophobia.

Yongdong Severence Hospital during the period from January 1, 1994 through December 31, 1994. The presence of symptomatic headaches was ruled out by means of history, physical and neurological examination, and radiological studies. 211 patients with chronic headaches had visited the clinic during the period above. These subjects were classified into headache subgroups according to a structured diagnostic headache interview which included: (a) migraine, (b) tension-type headache and (c) transformed migraine. For the diagnosis of headache, 'migraine' and 'tension-type headache' were defined by the optional diagnostic

criteria of the International Headache Society (1988)(Table 1). 'Transformed migraine' was defined by patients who clearly identified having two distinct types of headache. The following categories of patients were excluded: (a) patients with headache chronicity of less than 6 months and (b) patients with primary headache disorders which could not be classified into the above subgroups. The interview of 131 patients who satisfied the above criteria focused primarily on frequency, intensity, duration, laterality, character of pain, aggravation, other ameliorating factors, and family history. The intensity of the headache was described in three groups: "mild pain" (daily activities not inhibited), "moderate pain" (inhibiting, but not preventing daily activities, and "severe pain" (daily activities suspended). Depression was measured by the Beck Depression Inventory (BDI) (Beck *et al.* 1961; Hahn *et al.* 1986) upon their first visit to our clinic. The BDI is a 21-item self reported system providing a quantitative assessment of the intensity of depression. The items of the BDI were chosen on the basis of their relationship to overt behavioral manifestations of depression and do not reflect any theory regarding the etiology or the underlying psychological processes in depression (Beck *et al.* 1961). Evidence suggests that the BDI may be the most accurate inventory in representing the breadth of depressive symptoms (Beck *et al.* 1961; Beck and Beck, 1972; Hahn *et al.* 1986).

The following statistical analysis of data was used: the chi-square test, regression and one-way anova. Five percent level of significance and 95% exact confidence interval using the binomial distribution were used.

## RESULTS

The subjects were 131 patients who consisted of 33 men (25.2%) and 98 women (74.8%). These patients were as follows: 60 patients with migraine (45.8%), 49 with tension-type headache (37.4%), and 22 with transformed migraine (16.8%). The mean age for patients with migraine, tension-type headache, and

transformed migraine was  $38.4 \pm 12.1$ ,  $40.7 \pm 11.7$ , and  $41.1 \pm 12.0$  respectively. Their ages ranged from 12 to 68 and there was no significant difference between the groups ( $p > 0.05$ )(Table 2). There were also no significant difference in the mean age for onset and duration of the headache between the subgroups ( $p > 0.05$ )(Table 2).

### Characteristics of head pain

Table 1 are the summarized numbers of patients who were diagnosed with migraine, tension-type headache, and transformed migraine according to the clinical features. The throbbing character of headache in migraine, tension-type headache, and transformed migraine was 52 patients in 60 (86.7%), 14 in 49 (28.4%), and 20 in 22 (90.9%). The intensity of pain in patients with migraine and transformed migraine was more severe than those with the tension-type headache ( $p < 0.05$ )(Table 2). The headache was unilateral in 70% of migraine and 72.7% in transformed migraine, whereas 63% were bilateral in the tension-type headache. Migraine and transformed migraine were apt to have a character of unilateral headache and tension-type headache were apt to have bilateral headache ( $p < 0.05$ )(Table 2). Twenty four (25%) of 60 patients with migraine had a side shift of the headache (Table 2). The lasting time of the headache was almost within 3 days in migraine and variable in the tension-type headache and transformed migraine (Table 3). The attacks of headache were more frequent in patients with tension-type headache and transformed migraine than those with migraine (Table 4). However, there was no significant relationship between headache and family history (Table 2). The aggravating factors for chronic headache were: emotional factors (61.8%), physical factors (38.9%), sleep factors (29.8%), endocrine factors (28.6%), food & alcohol factors (22.1%), weather (21.3%), and seasonal factors (11.4%). The ameliorating factors of headache were rest or sleep, only after taking a drug, and with the passage of time (Table 5).

### Depressive trends

Depression in 116 patients of 131 patients,

**Table 2. Characteristics of headache in patients with chronic headache**

	Migraine (n=60)	Tension-type headache (N=49)	Transformed migraine (n=22)	Total (N=131)	Probability**
Male: female	13:47	18:31	2:20	33:98	
Age, y					
Mean	38.4	40.7	41.1	39.1	p>0.05
SD	12.1	11.7	12.0	11.9	
Mean Age at onset, y	31.1	34.4	31.9	32.5	p>0.05
Headache mean duration, y	7.3	6.3	9.3	7.3	p>0.05
Headache character	60(100)	49(100)	22(100)	131(100)	p<0.05
Throbbing(%)	52(86.7)	14(28.4)	20(90.9)	86(65.7)	
Non-throbbing(%)	8(13.3)	35(71.4)	2(9.1)	45(34.3)	
Intensity	60(100)	49(100)	22(100)	131(100)	p<0.05
Mild(%)	8(13.3)	16(32.7)	5(22.7)	29(22.1)	
Moderate(%)	5( 8.3)	12(24.5)	3(13.6)	20(15.2)	
Severe(%)	47(78.3)	21(42.8)	14(63.6)	82(62.7)	
Unilaterality	60(100)	49(100)	22(100)	131(100)	p<0.05
Unilateral(%)	42( 70)	18(36.7)	16(72.7)	76(58.1)	
Bilateral(%)	18( 30)	31(63.3)	6(27.3)	55(41.9)	
Side shift	60(100)	49(100)	22(100)	131(100)	p<0.05
Shifting(%)	27(45)	4( 8.2)	6(27.3)	37(28.2)	
Non-shift(%)	33(55)	45(91.8)	16(72.7)	94(71.8)	
Family history	60(100)	49(100)	22(100)	131(100)	p<0.05
Present(%)	25(41.5)	20(40.8)	10(45.5)	55( 42)	
None(%)	35(58.5)	29(59.2)	12(54.5)	76( 58)	

\*: By chi-square tests

**Table 3. Lasting time of headache**

	Migraine (n=60)	Tension-type headache (N=49)	Transformed migraine (n=22)	Total (N=131)
Hours(<6 hr)	11	14	10	35
1 day	22	6	2	30
1~3 days	2	9	3	34
4~6 days	2	2	1	5
1 week	2	11	5	17
Irregular	1	7	1	10

**Table 4. Frequency of headache**

	Migraine (n=60)	Tension-type headache (n=49)	Transformed migraine (n=22)	Total (N=131)
Daily	7	31	12	50
Weekly	25	6	6	37
Monthly	25	8	2	35
Less	2	2	2	6
Other	1	2	0	3

**Table 5. Ameliorating factors of headache**

	Migraine(%) (n=60)	Tension-type(%) headache (n=49)	Transformed(%) migraine (n=22)	Total(%) (N=131)
1) Rest/sleep	10(16.7)	6(12.2)	5(22.7)	21(16)
2) Quiet	1( 1.7)	3( 6.1)	0( 0 )	4( 3.1)
3) Compression	4( 6.7)	0( 0 )	2( 9.1)	6( 4.6)
4) Drug	15(25)	4( 8.2)	2( 9.1)	21(16 )
5) None	18(30)	21(42.9)	8(36.3)	47(35.9)
6) Other	12(20)	15(30.6)	5(22.7)	32(24.4)

**Table 6. Depressive trends in patients with chronic headache**

			BDI score	Probability*
Character	Throbbing	(N=79)	14.43±5.56	p>0.05
	Non-throbbing	(N=37)	14.98±7.23	
Intensity	Mild	N(=25)	14.68±6.46	p>0.05
	Moderate	(N=17)	14.88±7.83	
	Severe	(N=74)	14.83±6.62	
Frequency	Daily	(N=42)	15.35±6.48	p>0.05
	Weekly	(N=35)	16.28±7.36	
	Monthly	(N=31)	12.29±5.44	
	Other	(N=8)	15.25±7.94	
Family history	Present	(N=47)	14.42±6.45	p>0.05
	None	(N=69)	15.07±6.91	
Total		(N=116)	14.81±6.71	

\*: By chi-square tests

**Table 7. Beck depression inventory score in patients with migraine, tension-type headache and transformed migraine**

Type of headache		BDI score*	Renges
Migraine	(N=57)	12.52±6.43	2~28
Tension-type headache	(N=39)	15.10±5.22	4~25
Transformed migraine	(N=20)	20.75±6.57	10~36
Total	(N=116)	14.81±6.71	2~36

\*:  $p < 0.05$  by one-way anova

consisting of 57 patients with migraine, 39 patients with tension-type headache, and 20 patients with transformed migraine. In 116 patients, BDI scores did not correlate with the patient's age, duration, character, intensity and frequency of headache, and family history ( $p > 0.05$ ) (Table 6). The mean BDI score of the migraine, tension-type headache, and transformed migraine were  $12.52 \pm 6.43$ ,  $15.10 \pm 5.22$ , and  $20.75 \pm 6.57$  respectively (Table 7). Patients with tension-type headache and transformed migraine had a significantly higher mean BDI score compared to those of migraine.

## DISCUSSION

The correlation between headache and depression has been well recognized (Merikangas *et al.* 1988; Marchesi *et al.* 1989) but there has been controversy in whether this relationship reflects pathology which pre-existed the headache disorder, the consequences of livings with chronic pain, or the contribution to both pain and depression resulting from deficient levels of brain serotonin and/or other neurotransmitters (Jahanshahi and Philips, 1985; Glover *et al.* 1993; Silberstein, 1993; Manna *et al.* 1994). In this study, no significant correlation was found between depressive trends with patient's ages, duration, character, severity, frequency of headache, and family history. This result suggests that the level of depres-

sion does not simply correlate with the headache itself.

Previous studies have suggested that migraine and tension-type headache are not separate clinical entities but part of a continuum of headache disorders varying in severity (Philips, 1977). Mathew *et al.* (1982) introduced the concept of transformation headache, establishing that intermittent headache frequently was transformed over time to a daily headache. However, in the new headache classification (Headache classification committee of IHS, 1988), this term was abandoned because of the lack of evidence for a separate specific entity. Our study contradicts to the clinical continuum of migraine and tension-type headache in several ways. Not only were the clinical characteristics different, but also the level of depression was different between migraine and tension-type headaches. There were also a different sex distribution of migraine (male-female ratio, 2: 8), tension-type headache (male-female ratio, 4: 7), and transformed migraine (male-female ratio, 1: 10). Clinical characteristics of patients with migraine have more severe, throbbing, unilateral, side sifting headache than the others. Patients with tension-type headache have mild, non-throbbing, bilateral and short lasting headaches. Patients with transformed migraine have more severe, throbbing, unilateral and frequent headaches. Patients with transformed migraine and tension-type headache are much more likely than those with migraine to have a high level of depression. It is, therefore, highly probable that migraine and tension-type headache may be considered separate clinical entities. Although our study does not definitely support that the transformed migraine is either a specific entity or a coexisting migraine, tension-type headache and transformed migraine should be considered clinically as a distinct entity in view of having a characteristic clinical syndrome with high level of depression. Further studies are needed to verify the possible association of headache and depression and to find the pathophysiological mechanisms underlying depression.

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