

# The coexistence of anxiety and depressive personality traits in migraine

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## ABSTRACT

**Introduction:** Migraine is associated with a variety of personality traits. The objective of this study was to reevaluate the personality traits using Minnesota Multiphasic Personality Inventory-2 (MMPI-2) in migraine patients diagnosed by applying the new International Classification of Headache Disorders-2 criteria.

**Methods:** This was a case control study involving 70 migraine patients and 70 age- and gender-matched controls. The personality traits in the two groups were analysed using the MMPI. Data was analysed using the chi-square test.

**Results:** The migraine patients showed a higher MMPI score on the following personality traits: depression (39 versus 15, p-value is less than 0.0005), and anxiety (24 versus 11, p-value equals 0.011). Both depressive and anxiety personality traits were significantly higher in migraine patients.

**Conclusion:** All migraine patients should probably be screened for their personality traits and psychopathology using the MMPI.

**Keywords:** anxiety, depressive traits, migraine, personality traits, psychopathology

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## INTRODUCTION

Migraine is a common, debilitating disorder that imposes a large personal burden on sufferers and high economic costs on society. The one-year prevalence of migraine was quoted to be 14.7%. Population-based studies have consistently shown that about 5% of men and 15%–17% of women suffer migraine attacks.<sup>(1,2)</sup> The prevalence rate in Malaysia is close to that found in Western countries, which is about 9%.<sup>(3)</sup> Lipton and Stewart have reported that the majority of migraineurs experience partial or

total disability during an attack.<sup>(4)</sup> Various disorders like panic disorder and depression have been associated with migraine. The coexistence of comorbid conditions lead to further disability of migraine sufferers in all aspects of their daily lives, including employment, household work and non-work activities. Under-recognition of the associated conditions in migraine leads to poor response to treatment. We undertook this study to determine the association between certain personality traits and migraine.

## METHODS

This was a case control study involving 70 migraine patients who fulfilled the International Classification of Headache Disorders-2 2004<sup>(5)</sup> (ICHD-2) and 70 age-, gender- and race-matched controls. The ICHD-2 (Table I) tabulates the criteria for headache classification and diagnosis. This allows a systematic approach to a range of disorders that present with headache. The revised criteria are essential both to good clinical management and to useful research. The subjects were requested to answer the Minnesota Multiphasic Personality Inventory-2 (MMPI-2)<sup>(6)</sup> questionnaire which consists of 567 questions with true or false options. The MMPI-2 is a written psychological assessment used to diagnose personality and psychological disorders. The personality scales scored in the MMPI-2 will determine a specific personality trait. The MMPI-2 was assessed by a psychologist to determine the presence of depressive and anxiety personality traits. Statistical analysis was done by chi-square test using the Statistical Package for Social Sciences version 11.0 software (SPSS Inc, Chicago, IL, USA) and a p-value of less than 0.05 was deemed statistically significant.

## RESULTS

The median age was 30 years (interquartile range 24–40) in the migraine group and 31 years (interquartile range 23–39) in the control group (Table II). Out of the 70 patients, 63 (90%) had migraine with aura. There were 27 (38.6%) patients who had a family history of migraine. 38 (54.3%) patients had migraine for more than ten years. The duration of migraine was obtained from the patient's history. The duration of migraine did not differ significantly between the two genders. Migraine with aura

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**Table Ia. ICHD-2 diagnostic criteria for I.1 migraine without aura.<sup>(5)</sup>**

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- A. At least five attacks fulfilling criteria B–D
  - B. Headache attacks lasting 4–72 hours (untreated or unsuccessfully treated)
  - C. Headache has at least two of the following characteristics:
    - 1. Unilateral location
    - 2. Pulsating quality
    - 3. Moderated or severe pain intensity
    - 4. Aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs)
  - D. During headache at least one of the following:
    - 1. Nausea and/or vomiting
    - 2. Photophobia and phonophobia
  - E. Not attributed to another disorder.
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**Table Ib. ICHD-2 criteria for I.2.1 Typical aura with migraine headache.<sup>(5)</sup>**

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- A. At least two attacks fulfilling criteria B–D
  - B. Aura consisting of at least one of the following, but no motor weakness:
    - 1. Fully reversible visual symptoms including positive features (flickering lights, spots, or lines) and/or negative features (i.e. loss of vision)
    - 2. Fully reversible sensory symptoms including positive features (i.e. pins and needles) and/or negative features (i.e. numbness)
    - 3. Fully reversible dysphasic speech disturbance.
  - C. At least two of the following:
    - 1. Homonymous visual symptoms and/or unilateral sensory symptoms.
    - 2. At least one aura symptom develops gradually over > 5 minutes and/or different aura symptoms occur in succession over > 5 minutes.
  - A. Headache fulfilling criteria B–D for I.1 Migraine without aura begins during the aura or follows aura within 60 minutes.
  - B. Not attributed to another disorder.
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was more common in females (57) than males (6), ( $p < 0.0005$ ) (Table III). Overall, migraine patients were more likely to have abnormal personality traits than controls (65 versus 38,  $p < 0.0005$ ). Depressive personality was 4.6 times more common in migraine patients compared to controls (39 versus 15,  $p < 0.0005$ ) (Table IV). The migraine group was also more often very anxious comparatively (24 versus 11,  $p = 0.011$ ). The odds-ratio of anxiety personality trait in migraine was 2.8. Females were found to be more anxious compared to their male counterparts (17 versus 7,  $p = 0.025$ ) (Table III). The coexistence of anxiety and depressive personality traits was higher in migraine patients compared to controls (22 versus 5,  $p = 0.0005$ ).

## DISCUSSION

Migraine is a heterogeneous disorder characterised by attacks of headache that vary in frequency, duration, severity and symptomatology. Previous studies had used the International Headache Society (IHS)<sup>(7)</sup> (Table V) criteria from 1988. There have been limited publications

on the new ICHD-2 published in 2004. In contrast to the IHS criteria, the ICHD-2 provides a more comprehensive identification of migraine patients. The criteria for migraine with and without aura are shown in Table I. It also includes criteria for chronic migraine, new daily persistent headache and hemicrania continua. Previous reports on the comorbidity in migraine may be over or under represented. Applying the new ICHD-2 diagnostic criteria, we were able to reevaluate the associated personality traits in migraine patients.

The literature on personality characteristics and headache still poses considerable discrepancies, with regard to both the eventual pathogenic role of personality characteristics and the possible association between certain personality traits and migraine. Wolff proposed the definition of “migraine personality”, noting a characteristic set of psychological features that was found among adult migraine sufferers.<sup>(8)</sup> The relationship between migraine and psychopathology has been discussed more often than it has been systematically studied. More recent population-based studies have demonstrated associations

**Table II. Baseline characteristics of migraine patients and their controls.**

	Migraine n = 70 (%)	Control n = 70 (%)	p-value
Age (years)			
Median	30	31	NS
IQR	24–40	23–39	
Gender			
Females	59 (84.3)	59 (84.3)	NS
Males	11 (15.7)	11 (15.7)	
Ethnicity			
Malay	55 (78.6)	55 (78.6)	NS
Chinese	7 (10)	7 (10)	
Indian	8 (11.4)	8 (11.4)	
Education			
Primary	2 (2.9)	0 (22.9)	NS
Secondary	24 (34.3)	16 (22.9)	
Tertiary	44 (62.9)	54 (77.1)	

\* significant at  $p < 0.05$ ; IQR: interquartile range; NS: not significant

**Table III. Comparison of migraine with aura and anxiety trait between genders.**

	Male (n)	Female (n)	p-value
Migraine with aura	6	57	$< 0.0005^*$
Anxiety trait	7	17	$0.025^*$

\* significant at  $p < 0.05$

**Table IV. Comparison between depressive and anxiety traits in migraine and control groups.**

	Migraine n = 70 (%)	Control n = 70 (%)	p-value	OR (95% CI)
Depressive trait	39 (55.7)	15 (21.4)	$< 0.0005^*$	4.61 (2.07–10.39)
Anxiety trait	24 (34.4)	11 (16.0)	$0.011^*$	2.80 (1.16–6.83)

\* significant at  $p < 0.05$ ; OR: odds-ratio; CI: confidence interval

between migraine and depression and migraine with panic disorder. The association of personality traits and migraine was bi-directional.<sup>(9, 10)</sup>

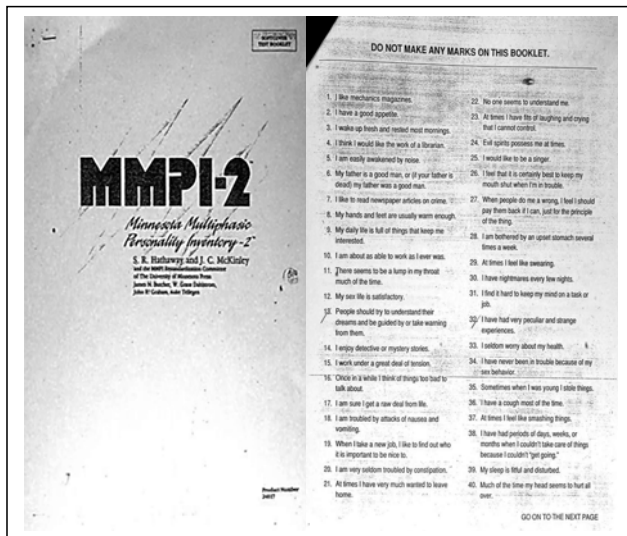
In our study, migraine patients showed significantly higher scores than controls on different personality traits. This may be attributed to the purer study population using the revised ICHD diagnostic criteria. Females were found to be more anxious compared to their male counterparts. Many previous studies analysed personality traits associated with headache of any form, and very few studies on their association with migraine. The association

**Table V. Abbreviated International Headache Society criteria for common primary headache (1988).**

Migraine without aura
Headache lasting four hours to three days
Nausea/vomiting and/or light and noise sensitivity
Two of the following:
Unilateral pain
Moderate or severe intensity pain
Aggravation by simple physical activity
Pulsating pain
Migraine with aura
At least three of the following:
Reversible focal brainstem or cortical dysfunction
Aura develops over $> 4$ minutes, or two auras in succession
Each aura $< 60$ minutes
Headache $< 60$ minutes following aura
Episodic tension-type headache
Duration of 30 minutes to seven days
At least two of the following:
Mild or moderate intensity pain
Bilateral pain
No aggravation by simple physical activity
Pressing or tight (non-pulsating) pain
No nausea/vomiting; may have light or noise sensitivity (not both)
Chronic tension-type headache
$> 15$ days pain per month, for $> 6$ months
At least two of the following:
Mild or moderate intensity pain
Bilateral pain
No aggravation by simple physical activity
Pressing or tight (non-pulsating) pain
No vomiting; nausea only, light sensitivity, noise sensitivity

All of the above diagnostic criteria require the exclusion of secondary (i.e. pathologically verifiable) causes for pain. This is normally achieved on clinical grounds.

between migraine, anxiety and depression is strong both in clinical and community samples, suggesting a bi-directional influence between them. The association between depressive personality trait and migraine support a bi-directional influence with one increasing first onset of the other.<sup>(11, 12)</sup> The depressive trait in persons with migraine is a psychological response to disabling migraine attacks, and vice versa. Our analysis on anxiety and depression showed a significant association with migraine. A study by Breslau et al also supports the evidence that the association between migraine and major



**Fig. 1** The Minnesota Multiphasic Personality Inventory-2. 1989. Minneapolis. The University of Minnesota Press.

depression can result from bi-directional influences.<sup>(10)</sup>

In many epidemiological and clinical studies, psychological stress is often mentioned as a potent factor that, in a hypothesised interaction with a dysregulated sympatho-adrenomedullary and serotonergic system, leads to an actual migraine attack. The association of migraine and anxiety/depression has been attributed to: (i) the same underlying aetiological factors are common both in migraine and anxiety/depression, and (ii) migraine causes

anxiety/depression or the converse. This study supports the findings that migraine is associated with certain personality traits. The presence of anxiety and depressive personality traits may warrant further psychological evaluation. Active screening using the MMPI-2 in migraine patients may identify these personality traits.

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