



Comorbidity of primary migraine headache : Prevalence and differences between migraine subtypes

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Comorbidities associated with migraine are essential to identify to gain greater insight into disease pathophysiology and help guide targeted treatment strategies.¹ The proposed genetic heterogeneity of migraine may differ by type of comorbidity.² In 2018, Lipton and colleagues used latent class analysis to classify migraine subgroups to predict a degree of disability and progression.³ Substantial research has been conducted on comorbidities and migraine, but only one report in Southeast Asia was conducted.⁴

Objectives

To determine the prevalence of comorbidity and the difference in comorbidities between migraine subtypes in Thailand.

Methods

This retrospective study was conducted at the Chulalongkorn Comprehensive Headache Center, King Chulalongkorn Memorial Hospital, Thailand, between January 2007 and June 2022 and was approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB No. 644/65).

This center creates a case-record form to gather patient information. Every patient who visits this center is registered and asked for information to complete the case-record form.

Patients with migraine according to the International Classification of Headache Disorders were recruited for the study. Information from the case-record forms was collected and analyzed. The comorbidities reported by the patients were confirmed by reviewing their electronic medical records.

The sample size was calculated based on the previous report on the prevalence of migraine comorbidity,⁵ and the difference in the proportion of comorbidity between episodic and chronic migraine.⁶

The sample size for prevalence was 378 patients, and for the difference in comorbidity between episodic and chronic migraine, it was 542 patients in total.

Statistical analysis was applied as appropriate. The significant p-value was 0.05, and the Benjamini-Hochberg procedure was applied to adjust for the family-wise error rate of multiple analyses.

Results

Of the 681 patients registered at the center, 572 were diagnosed with migraine and were analyzed. The mean age of the patients was 42.3 (SD 14.1) years. Most of the patients were female (84.1%) and were working or studying (85.3%). Nearly half of the patients had completed university education (44.8%).

The proportion of migraine patients with aura was **29.9%**, and the ratio of patients with episodic to chronic migraine was 1.02 to 1. This study found that patients with one comorbidity and those with two or more comorbidities accounted for **36.7%** (210/572) and **16.8%** of the total (96/572), respectively. The prevalence of patients with existing comorbidities was shown in the Table.

Patients with episodic migraine had a significantly higher proportion of completed university education than those with chronic migraine, with an odds ratio of 2.28 (95% CIs **1.63** to **3.19**) and a p-value < 0.001, as well as patients without aura compared to those with aura, with an odds ratio of 1.77 (95% CIs **1.22** to **2.56**) and a p-value < 0.003.

In addition, patients with chronic migraine had a significantly higher proportion of comorbidities and of two or more comorbidities than those with episodic migraine, with an odds ratio of 1.51 (95% CIs **1.09** to **2.10**) and of 1.70 (95% CIs **1.07** to **2.66**), respectively, as did those with hypertension comorbidity, with an odds ratio of 1.87 (95% CIs **1.16** to **3.02**) and a p-value < 0.05.

Comorbidities with thyroid disease and dizziness had odds ratios of 1.57 and 1.92, respectively, comparing patients with chronic and episodic migraine, but without statistical significance.

There were no significant differences in comorbidities between migraine patients with and without aura.

Discussion

This study revealed that patients with episodic migraine had a significantly higher proportion of completed university education than those with chronic migraine, confirming that chronic migraine causes functional disability.

Interestingly, patients without aura had a significantly higher proportion of completed university education than those with aura, suggesting that those auras might disturb their learning ability.

Patients with chronic migraine had a significantly higher proportion of comorbidities and two or more comorbidities compared to those with episodic migraine, so all of the comorbidities for those with chronic migraine should be identified and treated together to improve functional ability.

This study also demonstrated thyroid comorbidity and dizziness, which were higher in proportion than depression, anxiety, and asthma. Migraine and thyroid dysfunction may have a significant genetic association⁷ and be linked with long-term use of oral antiepileptic drugs.⁸ A link between migraine and dizziness or vertigo have also been reported.⁹⁻¹¹

Conclusion

This study confirmed the comorbidities of migraine that need to be taken into account when treating migraine, including choosing acute and preventive medications. In addition, it needs to be treated together with migraine and comorbidities.

Other comorbidities and differences between migraine with and without aura, and episodic and chronic migraine, should be proven to support their association.

Table: Prevalence of comorbidity and the differences between migraine subtypes

Comorbidity	Migraine						
	Overall (572)	Episodic (289)	Chronic (283)	p-value	with aura (171)	without aura (401)	p-value
Comorbidity presence, n (%)	306 (53.5)	140 (48.4)	166 (58.7)	0.018	95 (55.6)	211 (52.6)	0.58
Hypertension, n (%)	83 (14.5)	31 (10.7)	52 (18.4)	0.013	24 (14.0)	59 (14.7)	0.94
Allergic rhinitis, n (%)	74 (12.9)	37 (12.8)	37 (13.1)	0.98	19 (11.1)	55 (13.7)	0.48
Dyslipidemia, n (%)	50 (8.7)	29 (10.0)	21 (7.4)	0.34	13 (7.6)	37 (9.2)	0.64
Thyroid disease, n (%)	35 (6.1)	14 (4.8)	21 (7.4)	0.27	14 (8.2)	21 (5.2)	0.25
Dizziness, n (%)	31 (5.4)	11 (3.8)	20 (7.1)	0.12	7 (4.1)	24 (6.0)	0.48
Depression, n (%)	16 (2.8)	4 (1.4)	12 (4.2)	0.069	5 (2.9)	11 (2.7)	0.88

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