Migraine and isolated recurrent vertigo of unknown cause

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Chronic recurrent attacks of vertigo, not associated with any auditory or neurological symptoms, are a common reason for referral to our neurotology clinic. Even after an extensive neurotological evaluation, some cases remain undiagnosed. We prospectively evaluated 72 consecutive patients who presented to the clinic with isolated recurrent vertigo of unknown cause. All patients underwent diagnostic evaluation to exclude identifiable causes of isolated recurrent vertigo. We compared the prevalence of migraine, according to the International Headache Society (IHS) criteria, in the isolated recurrent vertigo group, with a sex- and age-matched control group of orthopedic patients. The prevalence of migraine according to IHS criteria was higher in the isolated recurrent vertigo group (61.1%) than in the control group (10%; $p < 0.01$). Only 16.7% of patients had an abnormal vestibular function test. The most common abnormal finding was a unilateral vestibular weakness to caloric stimulation. Our results suggest that migraine should be considered in the differential diagnosis of isolated recurrent vertigo of unknown cause. [Neurol Res 2002; **24**: 663–665]

Keywords: Recurrent vertigo; migraine

INTRODUCTION

Chronic recurrent vertigo unassociated with other auditory or neurological symptoms is one of the most common reasons for referral to our neurotology clinic. Even after a detailed neurotological evaluation including quantitative auditory and vestibular function testing, a specific diagnosis is not identified. The clinical syndrome has been given many names, including benign recurrent vertigo[1], recurrent vestibulopathy[2], and vestibular Meniere's disease[3]. Even though there have been several reports on the clinical features of isolated recurrent vertigo[1–8], the etiology for the condition still remains unclear. Some investigators[1,4,6–8] have noted the common occurrence of both isolated recurrent vertigo and migraine in the same patient and have reported a higher incidence of migraine in families of patients with isolated recurrent vertigo. They suggested that episodes of vertigo might be part of a migraine syndrome. Previous reports[1,4,6–8] on the high frequency of migraine in patients presenting with isolated recurrent vertigo, however, have not yet been confirmed by a controlled study and have only been retrospective. On the other hand, another report[5] showed that the incidence of migraine in patients with isolated recurrent vertigo was not higher than that of the general population. The authors of that report suggested that isolated recurrent vertigo and vertigo from migraine appear to be different conditions.

Therefore, we have performed this study to assess the prevalence of IHS migraine in patients with idiopathic isolated recurrent vertigo as compared with controls, and to identify the clinical features and abnormalities of vestibular testing in patients with isolated recurrent vertigo.

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MATERIALS AND METHODS

The study population consisted of two subject groups: 72 consecutive patients who presented to our neurotology clinic with chronic recurrent attacks of isolated vertigo, and 100 orthopedic patients from the same hospital (control group), matched by age and sex with the vertigo group. The chronic recurrent vertigo group comprised 72 consecutive patients presenting to the neurotology clinic between March 2000 and July 2001. During this period, no special effort was made to attract patients with chronic recurrent vertigo. We selected many patients who met the following criteria: a history of transient recurrent episodes of spontaneous vertigo, and the absence of auditory or neurological symptoms or signs. Vertigo was defined as an illusion of movement of the environment. All subjects underwent extensive neurotological evaluation to exclude identifiable causes for recurrent vertigo, including auditory and vestibular function testing and appropriate imaging studies. None of the subjects had hearing loss or any other auditory features of Meniere's disease. All had a normal neurotological examination. Following these criteria, 72 patients were selected who had a final diagnosis of isolated recurrent vertigo of unknown cause. Each patient completed a standard dizziness questionnaire, designed to obtain information regarding the characteristics of the vertigo, the presence of migraine headache, and accompanying symptoms, as well as the temporal relationship with episodes of vertigo and migraine. We used the current International Headache Society (IHS) criteria[9] for the diagnosis of migraine.

The control group consisted of 100 unselected

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Table 1: Lifetime prevalence of migraine in both study groups

	Vertigo group	Control group	Significance
Sex			
Women	52	70	NS
Men	20	30	NS
Migraine	44 (61.1%)	10 (10%)	$p < 0.01$
Women	37	9	$p < 0.01$
Men	7	1	$p < 0.01$
Migraine			
Onset of vertigo before 50 years	40 (76.9%)		
Onset of vertigo after 50 years	4 (20.0%)		
Migrainous vertigo	44 (61.1%)	0	

Values expressed as number (%). NS, not significant.

Table 2: Result of electronystagmography

Type	Number (%)
Normal	60 (83.3)
Abnormal	12 (16.7)
Unilateral CP	8
Stational positional nystagmus	2
Head shaking nystagmus	2

CP, canal paresis. >20/sec side-difference on cold water caloric stimulation.

patients from an orthopedic ward, matched only by sex and age with subjects of the isolated recurrent vertigo group. In the orthopedic patients, causes for admission were unrelated to either vertigo or headache. A neurology resident interviewer, who had been trained in the neurotology clinic, performed face-to-face interviews for identification of migraine and vertigo. If the patients had migraine and episodic vertigo, full neurotological evaluation was performed to exclude the common causes of episodic vertigo. In each of the two groups, the prevalence of migraine was assessed as lifetime prevalence. Statistical analysis was performed using a χ^2 test to compare both groups.

RESULTS

The vertigo group included 52 (72.2%) women and 20 (27.8%) men, who ranged in age from 17 to 74 years at the time of examination. The mean age was 47.0 ± 15.0 years. The mean age at onset of the vertigo was 35.5 years, with a range of 15 to 73 years. The control group included 70 (70%) women and 30 (30%) men, who ranged in age from 17 to 73 years. The mean age was 48.5 ± 13.2 years. There were no differences between groups with respect to sex and age.

All of the patients with isolated recurrent vertigo had at least two episodic attacks of vertigo, but the frequency of episodes of vertigo was highly variable both between patients and in the same patient over time. It ranged from multiple episodes per day, to episodes occurring on a monthly to yearly basis. The duration of the usual episodes of vertigo exhibited a bimodal distribution. Thirty-seven subjects (51.4%) stated that their vertigo lasted a few hours, while 28 (38.9%) said that their vertigo lasted only a few minutes.

The lifetime prevalence of migraine was higher in the isolated recurrent vertigo group (61.1%) than in the age- and sex-matched control group (10%, $p < 0.01$) (*Table 1*). The difference was statistically significant for both women and men. The lifetime prevalence of migraine was higher in women than in men from either group. In the control group, no subject had recurrent vertigo. About 77% of the patients with onset of isolated recurrent vertigo of unknown cause before the age of 50 years had migraine. By contrast, only 20% of patients with onset of isolated chronic recurrent vertigo of unknown cause after the age of 50 years had migraine. In 24 (54.5%) of 44 patients with chronic recurrent vertigo of unknown cause and migraine, vertigo was frequently associated with migraine headache. Of these patients, 14 (58.3%) reported that their vertigo was consistently dependent upon the presence of headache. On quantitative electronystagmographic (ENG) testing, 12 patients (16.7%) were found to have vestibular abnormalities. Eight patients had a unilateral weakness on caloric testing. Two patients had transient head-shaking nystagmus and another two patients had stational positional nystagmus (*Table 2*). Of the 12 patients with vestibular abnormalities, 7 (58.3%) had a migraine headache and, of the eight with a unilateral weakness on caloric responses, four (50.0%) had a migraine headache.

DISCUSSION

We found that patients with isolated episodic vertigo of unknown cause were five times more likely to have migraine than the control group. A key issue in our study is the relationship between the recurrent vertigo and migraine. Because migraine and recurrent vertigo are so common in the general population, they could occur together in the same patient by chance alone. However, we do not think that the high prevalence of migraine in our chronic vertigo population is a chance occurrence, because the prevalence in the control group was similar to that of the general population[10]. Furthermore, more

than 75% of the patients with onset of isolated recurrent vertigo under the age of 50 years met the diagnostic criteria for migraine. Only 20% of the patients with onset of isolated episodic vertigo after the age of 50 years had migraine.

Previous studies[1,4,6–8] have reported that 30%–100% of patients with chronic vertigo had migraine. These early studies were not based on age- and sex-matched controls and, with a few exceptions[7,8] did not use IHS criteria for the diagnosis of migraine. Therefore, our study may provide valid evidence of the statistical association of isolated recurrent vertigo and migraine. A consistent unexplained feature of isolated recurrent vertigo of unknown cause in our study is the female preponderance of 2.6:1. In a report by Slater[1], 71% were females, while in another study[4], the proportion of women ranged up to 100%. As migraine is two to three times more common in women than men, a migraine cause for chronic recurrent vertigo could, at least in part, explain the female preponderance. The high incidence of female occurrence, in both isolated recurrent vertigo and migraine, may indicate that the two diseases have similar etiological factors.

Although numerous studies have documented that migraine can lead to permanent vestibular deficits[11–13] the precise mechanism for vestibular symptoms and signs in migraine is still unclear. Unilateral canal paresis seen on caloric stimulation is more common in patients with migraine than in the general population[11]. Vasospasm of the labyrinthine arteries is a possible mechanism, because vasospasm definitely occurs with migraine[14]. There is convincing evidence for vasospasm as a primary cause of retinal migraine[15,16]. Some patients with childhood migraine experience recurrent transient episodes of monocular visual loss[16], and this can be prevented with calcium channel blockers[17]. Although vasospasm is a well-documented phenomenon in the pathogenesis of migraine, it may be a secondary phenomenon due to some underlying metabolic disorder. For example, the vasospasm associated with the classic visual aura is almost certainly secondary to a primary neuronal metabolic abnormality (so-called spreading wave of depression[14]). Vasospasm in the inner ear might also be secondary to primary metabolic abnormalities of the inner ear. Primary metabolic abnormalities occurring in the brain and inner ear could explain the brain and inner ear symptoms including headache or episodic vertigo in our patients with migraine and chronic recurrent vertigo of unknown cause.

In 44 patients with migraine and isolated recurrent vertigo, 24 displayed a temporal relationship between their vertigo and headache. Therefore, it is more important to get a history of such headaches and analyse the characteristics of any headache from patients with recurrent vertigo. These concepts are often forgotten when the patients usually do not complain of headache. It has been our experience that a patient is usually not aware of a transient headache if the patient suffered from severe vertigo and vomiting. The clinical implication of our research is that personal history of migraine headache is a potential item of reassurance that the phenomenon is indeed migraine.

Twelve of our patients with isolated recurrent vertigo of unknown cause had abnormalities on ENG testing. Unilateral caloric weakness was found in eight of our cases of isolated recurrent vertigo. Four of the eight cases with unilateral caloric weakness had a typical migraine, whereas the other four with unilateral caloric weakness did not have a migraine headache. This obviously makes our findings nonspecific. Furthermore, it is generally accepted that subtle vestibular abnormalities are relatively common in patients with isolated recurrent vertigo independent of migraine[7,18,19]. Therefore, our results suggest that subtle vestibular abnormalities are not specific to isolated recurrent vertigo associated with migraine.

CONCLUSION

Isolated recurrent vertigo of unknown cause appears as a distinct migraine syndrome affecting the vestibular system, and only a detailed history about headache will help in making a correct diagnosis when other processes have been ruled out by complete neurotological evaluation.

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