

Prediction of Vertigo Recurrences in Meniere's Disease by the Head-Shaking Test

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Abstract: Researchers have observed that when head-shaking nystagmus (HSN) is provoked in patients with peripheral vestibular disorders, usually (in more than 75% of cases) it beats toward the normal or unaffected ear. The reverse of this pattern occurs commonly in patients with Meniere's disease. This finding presumably reflects the changeable pathophysiological state of the labyrinth of Meniere's disease. We retrospectively analyzed clinical records of eight patients who had unilateral Meniere's disease and came to Gunma University Hospital for consultation in the period from 1984 through 1989. All patients satisfied the following condition: In the period prior to the attacks of vertigo, for which a 10-day period preceding the attack was arbitrarily considered (the forerunning period), HSN reversed its direction, appeared, or disappeared. When HSN showed a biphasic pattern, only the first phase was considered in this present analysis. In the period before the attack, HSN reversed its direction from the normal to the morbid ear five times in four patients, appeared toward the morbid ear in three patients, and disappeared from one beating toward the normal ear before the forerunning period of vertigo attacks in one patient. These findings suggest that the occurrence of HSN directed to the morbid ear in the recuperation period in Meniere's disease might indicate the impending recurrence of a vertigo attack in a few days. In the present group of patients, vertigo attacks occurred from 6 hours to 8 days (average, 3.2 days) after the observation of HSN beating toward the morbid ear. In three of these patients, the immediate administration of isosorbide (a hyperosmotic diuretic) in this stage successfully suppressed the recurrence of vertigo attacks.

Head-shaking nystagmus (HSN) almost always is pathological when it is recognized under the Frenzel's glasses in darkness, and suggests a vestibular lesion of peripheral or central origin. Researchers have observed that when HSN is provoked in patients with peripheral vestibular disorders, usually (in more than 75% of cases) it beats toward the normal or unaffected ear. The reverse of this pattern occurs commonly in patients with Meniere's disease [1]. This finding presumably reflects the changeable pathophysiological state of the labyrinth, such as endolymphatic hydrops, of Meniere's disease.

HSN beating toward the normal ear in patients with unilateral peripheral vestibular lesions is known as *deficiency nystagmus*. In contrast, HSN beating toward the morbid ear in unilateral peripheral vestibular lesions may be a recovery nystagmus or an irritative nystagmus [2].

These facts have led us to consider that HSN beating toward the morbid ear may warn of impending vertigo recurrence in Meniere's disease and that the attack of vertigo may be avoided if the patient is treated properly during this pathological state of the inner ear.

METHOD

We retrospectively analyzed clinical records of eight patients who had unilateral Meniere's disease and came to Gunma University Hospital for consultation in the period from June 1984 through June 1989. They were required to meet the following condition: In the period prior to the attacks of vertigo, for which a 10-day period preceded

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ing the attack was arbitrarily considered (the forerunning period), HSN observed using the Frenzel's glasses in darkness reversed its direction, appeared, or disappeared. When the HSN showed a biphasic pattern [2,3], only the first phase was considered in the present analysis.

RESULTS AND COMMENTARY

The main clinical findings of these eight patients are shown in Table 1. Numbers of male and female patients were equal within the age range of 27–58 years (average, 47). The observation periods of each patient were from 2 months to 1 year and 10 months (average, 1 year and 3 weeks). In the forerunning period of the vertigo attack, HSN reversed its direction from the normal to the morbid ear five times in four patients (patients 1, 4, 5, and 8; see Table 1), appeared toward the morbid ear in three patients (patients 2, 3, and 7; see Table 1), and disappeared from one beating toward the normal ear before the forerunning period in one patient (patient 6; see Table 1).

These facts suggested that the occurrence of HSN directed to the morbid ear in the recuperation period in Meniere's disease might indicate the impending recurrence of a vertigo attack in a few days. In the present group of patients, vertigo attacks occurred from 6 hours to 8 days (average, 3.2 days) after the observation of HSN beating toward the morbid ear. In three of these patients, the immediate administration of isosorbide, a hyperosmotic diuretic [4], in this stage successfully suppressed the recurrence of vertigo attacks.

CASE REPORT

MS, a 28-year-old woman (patient 5; see Table 1), first consulted us on August 12, 1985 with a 2-year history of frequently occurring episodic vertigo associated with

Table 1. Patients Who Showed Changes of HSN in the Forerunning Period of Vertigo Attacks*

Patient No.	Age (Yr)	Gender	Period of observation (Yr)	Morbid Ear	HSN between attacks (Forerunning Period)	
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1	55	F	1.83	L	Toward R	(L)
2	44	F	1.67	R	—	(R)
3	27	M	1.33	L	—	(L)
4	52	M	1.00	R	L	(R)
5	28	F	1.58	R	L	(R)
6	53	M	0.17	R	L	—
7	58	F	0.42	R	—	(R)
8	55	M	0.50	L	R	(L)

HSN = head-shaking nystagmus; F = female; M = male; L = left; R = right. *A 10-day period preceding the attack.

right hearing loss. Usually the vertigo attacks lasted for some 3–4 hours, accompanied by nausea and, at times, vomiting, by a sensation of fullness or pressure of the right ear, and by increased tinnitus or other auditory symptoms. The ear drums were normal. Audiometric examination revealed a mild sensorineural low-tone loss in the right ear, with normal hearing in the opposite ear. Recruitment phenomenon was positive. The patient's hearing loss in the right ear was fluctuating. Bithermal caloric testing demonstrated a vestibular paresis of 57% in the right ear. Radiological findings, including computed tomography, were normal. No neurological signs otherwise were seen. A clinical diagnosis was made of classic Meniere's disease involving the right ear (Table 2).

Spontaneous nystagmus (SN) and HSN were not observed under the Frenzel's glasses on the day of the patient's first visit (August 12, 1985) nor on August 15. Cercine (a diazepam) and Merislon (betahistine mesylate) were prescribed for the patient, but she had an episode on August 17 at home. On August 22, HSN beating to the left (i.e., toward the intact) ear appeared. However, on September 5, HSN beating to the right (i.e., toward the morbid) ear was observed; on September 11, 16, and 18, the patient experienced vertigo attacks. On September 19, HSN was directed to the left. Twenty days thereafter (October 9), the patient came to the hospital because she had an episode early that morn-

Table 2. Nystagmus Findings of Patient MS

Date	Spontaneous nystagmus	Head-shaking nystagmus	Remarks
August 12	No	No	First consultation
15	No	No	
17			Vertigo attack
22	No	Toward L	
September 5	No	R	Vertigo attacks
11, 16, 18			
19	No	L	
October 9	Toward R	R	Vertigo attack
17	No	R	
20,22			Vertigo attacks
28		L	
30	No	L	
November 7	No	R	Isosorbide, 90 ml/day (total, 21 days)
14		L	
21	No	No	
28	No	No	

L = left; R = right. Note: Ménière's disease in the right ear during treatment, 1985.

ing. We were able to observe SN to the right using Frenzel's glasses. On October 17, SN could not be observed any longer, but HSN still appeared to the right, and the patient experienced vertigo attacks on October 20 and 22.

These facts suggested that the appearance of HSN directed toward the involved ear could be a warning signal for the imminent occurrence of vertigo attacks in this case. On October 30, HSN was provoked to the left but, on November 7, it appeared in the opposite direction. The patient was started immediately on therapy with Isosorbide, 90 ml/day. On November 14, HSN was directed to the left. On November 21 and 28, HSN was no longer provoked. Isosorbide was continued for a total of 3 weeks.

The patient wanted to have a second child, so we avoided giving medicine and sectioned both the chorda tympani and the tympanic plexus of her right ear on January 7, 1986. Thereafter, she had vertigo episodes less frequently. She took medicine only occasionally and became pregnant in April 1986. On January 16, 1987, the day of her last visit, no SN or HSN was observed. The right-ear deafness remained in the 25- to 45-dB range, with normal hearing in the left ear.

CONCLUSIONS

The occurrence of HSN beating toward the morbid ear in the recuperation period in Meniere's disease may indicate the impending recurrence of a vertigo attack in a few days. The immediate administration of a hyperosmotic diuretic in this stage of Meniere's disease successfully may suppress the recurrence of vertigo attacks.

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