Progression of Symptoms of Dizziness in Ménière’s Disease

Mari Havia, MD; Erna Kentala, MD, PhD

Objective: To evaluate the progression of symptoms of dizziness in Ménière’s disease (MD) by disease duration.

Design: Prospective study of patients with MD. Patients were clinically examined, filled out a questionnaire concerning their symptoms, and were divided into 7 groups based on disease duration.

Setting: Tertiary referral clinic.

Patients: Sample of 243 consecutive patients with a definite diagnosis of MD who were referred to the vestibular laboratory. Disease duration varied from recent onset to 41 years.

Results: No differences were found in frequency, intensity, or duration of vertigo attacks between the different groups. Patients who had MD for less than 10 years experienced less continuous vertigo than those who had MD for more than 20 years. Seventy-five percent of patients who had MD for more than 20 years considered their vertigo attacks severe and 36% still had attacks 1 to 4 times per week. Nausea associated with vertigo was most common among those with a long disease history.

Conclusion: Patients with MD can have severe symptoms of dizziness even after a 20-year disease history.


MÉNIÈRE’S DISEASE (MD) is an idiopathic syndrome of endolymphatic hydrops. For clinical purposes, the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) criteria, the triad of vertigo, hearing loss, and tinnitus, are typically used to diagnose MD. Tinnitus can be replaced by a sense of aural fullness. Vertigo has been reported to be the most disturbing of these symptoms owing to its unpredictable nature. It also has a greater impact on quality of life than tinnitus and hearing loss, which, in turn, have a greater psychosocial impact. Vertigo attacks vary in severity, last from several minutes to several hours, and are often accompanied by nausea.

Remissions and exacerbations are typical of MD. Stabilization of the disease, where vertigo attacks disappear or at least diminish over time, has been reported. This decline in the frequency of attacks is estimated to take up to 2 decades from the onset of disease. Estimations of the prevalence of bilateral cases of MD range widely, but the proportion appears to rise with disease duration. In one study, up to 47% of patients with MD were found to have bilateral symptoms after 20 years of follow-up.

The changes in audiologic test results in the course of MD are better known than the progression of symptoms of dizziness. The purpose of this study was to characterize the vertigo symptoms by duration of MD, with special reference to patients with a long history of persisting symptoms.

METHODS

The participants, 243 consecutive patients with MD recruited when they were examined in the vestibular unit of Helsinki University Hospital prior to the widespread use of gentamicin as a treatment modality, represent a cross section of patients with different durations of MD. They consisted of 174 women (72%) and 69 men (28%), with a mean age of 50 years at the time of testing (range, 20-80 years). All patients fulfilled the AAO-HNS criteria for definite MD; they had had at least 2 vertigo attacks lasting more than 20 minutes even though they currently reported shorter attacks; and had sensorineural hearing loss and tinnitus documented by audiometric testing. The severity of MD was estimated by the AAO-HNS functional scale.

The patients filled out a questionnaire concerning their symptoms, concurrent diseases, the medications they were taking, former head traumas, and their use of tobacco and alcohol. They were examined in our vestibular unit to exclude other reasons for their symptoms. The clini-
cal examination was supplemented with audiologic and otoneurologic tests. Otoneurologic tests included electronystagmography, posturography, and saccadic and pursuit eye movements. Imaging studies and serologic tests were carried out as needed. Most patients had been conservatively treated and only 10 had undergone endolymphatic sac surgery. Conservative treatment included a sali-restricted diet and the use of betahistidines, diuretics, or carbamide. Many patients had used each of these treatment modalities at various periods of their disease history. During vertigo attacks patients had also often used metoclopramide or prochlorperazine. Information was stored in the database of the otoneurologic expert system ONE.9

The questionnaire inquired about the current intensity, frequency, and duration of vertigo attacks. Intensity was specified as follows: (1) mild, I can continue my activity; (2) moderate, I must quit my activity; (3) severe, I must lie down; and (4) very severe, I am experiencing vertigo although I am lying down. Frequency was defined as (1) 1 to 2 per year; (2) 3 to 12 per year; (3) 1 to 4 per month; (4) 2 to 7 per week; and (5) vertigo was continuous. The duration of attacks was divided into the following 5 categories: (1) 1 to 15 seconds, (2) 15 seconds to 5 minutes, (3) 5 minutes to 4 hours, (4) 4 to 24 hours, and (5) 1 to 5 days. We also enquired about nausea accompanying vertigo. The questionnaire has been presented in detail elsewhere.10

For analysis of progression of vertigo symptoms by duration of disease, patients were divided into the following 7 duration groups based on time elapsed since onset of MD: (1) less than 4 months; (2) 1 to 4 months; (3) 5 to 12 months; (4) 1 to 4 years; (5) 5 to 10 years; (6) 11 to 20 years; and (7) more than 20 years. We also enquired about nausea accompanying vertigo. The questionnaire has been presented in detail elsewhere.10

In the statistical analysis we calculated the frequencies, means, and standard deviations for all study variables. When data were skewed, medians and ranges were expressed. The relationship between the variables and duration of MD was evaluated by cross-tabulation and tested by χ² test. Differences between the groups were studied by comparing group means using one-way analysis of variance. To detect group means that were significantly different from each other the Tukey multiple pairwise comparisons were used. Linear regression analysis was used to explain dependence, and correlations were calculated to show the degree of relation. Statistical significance was defined as P<.05. All analyses were done using the SPSS statistical program (version 10; SPSS Inc, Chicago, Ill).

RESULTS

The mean age at onset of symptoms was 44 years (range, 17-79 years) (Figure 1). The disease was right-sided in 38% (n=93), left-sided in 46% (n=112), and bilateral in 16% (n=38) of patients, and distribution did not differ between sexes. The prevalence of bilateral disease increased with duration of disease (Figure 2), and was the highest (44%) among those who had had symptoms for more than 20 years. However, for 2 patients entering the study with a recent diagnosis of MD, the disease was bilateral. There were no statistical differences in intensity, frequency, or duration of vertigo attacks among patients with bilateral and unilateral disease or between sexes.

FREQUENCY OF VERTIGO ATTACKS

The frequency of vertigo attacks among the 243 subjects varied from 1 to 2 per year to continuous vertigo; 13% (n=19) had attacks once or twice per year, 23% (n=35) had attacks 3 to 12 times per year, 63% (n=147) had more than 1 attack per month, and 5% (n=13) experienced continuous vertigo.

The number of patients reporting continuous vertigo was very low (0%-4%) in the groups with a disease duration of 5 months to 10 years, but it began to grow after a duration of 10 years, reaching 21% among patients who had had MD for 20 years. Thirty-one percent (n=4) of patients reporting continuous vertigo had had symptoms for less than 4 months. However, no significant differences were observed in mean attack frequency between different duration groups (Figure 3A). Patients with MD for more than 20 years often had vertigo attacks 1 to 4 times per month (36% [n=5]). The distribution of attack frequency is presented in Figure 3B.

DURATION OF VERTIGO ATTACKS

The duration of vertigo attacks varied from a few seconds to 1 to 5 days. Most commonly, attacks lasted between 5 minutes and 4 hours (in 36% [n=88] of patients). In 88% (n=203) of patients, attacks lasted less than 1 day, and the remainder (12%, n=29) had attacks lasting 1 to

©2004 American Medical Association. All rights reserved.
5 days. Fifty percent (n=8) of patients with symptoms for more than 20 years had attacks lasting 5 minutes to 4 hours, and 38% (n=6) had attacks lasting between 4 and 24 hours. The number of very long attacks (1-5 days) did not rise with a 20-year disease duration, although the frequency of attacks increased. The duration of attacks increased as the disease progressed (Figure 4A and B).

VERTIGO ATTACK INTENSITY

More than half (56% [n=134]) of the patients scored their vertigo attacks as moderate, ie, forcing them to stop their activity and lie down. They were mild in 17% (n=41) of patients, allowing them to continue with their work. The remaining 27% (n=64) had trouble coping with the attacks even while lying down. The proportion of those having severe or very severe attacks increased from 42% to 75% with disease progression.

None of the patients who had had symptoms for 20 years or more considered their symptoms to be mild, whereas during the first 10 years of illness 28% did. No significant differences were seen in duration, frequency, or intensity of vertigo attacks between the groups with different MD duration (Figure 5A and B).

The patients who had long attacks also considered them more intense (r=0.51). Intensity increased with duration for attacks lasting up to 4 hours; beyond 4 hours, intensity remained unchanged (Figure 6). A distribution of questionnaire findings is presented in the Table.

SURGICALLY TREATED PATIENTS

The 10 patients who had undergone endolymphatic sac surgery were in duration groups 2, 4, 5, 6, and 7, and 6 of these patients had had symptoms for more than 10 years. All of them reported longer, more intense, and more frequent vertigo attacks than those who had no surgery, and 90% considered their attacks severe or very severe.

COMMENT

After 9 years of follow-up, vertigo attacks in patients with MD have been reported to either disappear (in 54%) or clearly diminish (in 30%). We did not study the recovery...
rate but the progression of vertigo symptoms by duration of MD, with special reference to patients whose symptoms had lasted longer than 20 years. The proportion of patients reporting severe or very severe attacks increased with disease duration. Patients with MD for more than 20 years still had 1 to 4 vertigo attacks per month. Among several authors who have found signs of resolution of symptoms as MD progresses, Oosterveld\textsuperscript{11} reported that nausea during the attacks is rarer among patients who have had the disease for more than 1 year. However, we noticed the opposite, as in our study nausea was more common later in the disease than at the beginning. After the first year, subjects reported higher scores for nausea during attacks, and the mean scores for nausea increased with duration of MD.

There was a steady increase in the number of patients who had had symptoms for more than 10 years and were complaining about continuous vertigo. The proportion of patients with continuous vertigo was found to be very low (0%-4%) among those who had had symptoms for at least 5 months and up to 10 years. The high proportion (21%) of reports of continuous vertigo among patients who had had symptoms for more than 20 years raises the question of whether these patients simply had dys-equilibrium, as might occur during a stable period of MD, rather than true rotatory vertigo. However, 31% of patients with continuous vertigo were still in the early stages of MD, having had symptoms for less than 4 months and presumably not having reached the stage of stable vestibular deficit. Migraine-associated dizziness has to be taken into account in the differential diagnostic procedure when patients had continuous vertigo that lasted 1 to 5 days or longer. Reploeg and Goebel\textsuperscript{12} found that the vertigo or dys-equilibrium of 49% of the patients who had migraine associated with their symptoms lasted 1 to 2 days.

Green et al\textsuperscript{3} attempted to define the point of symptom stabilization in MD and concluded that the plateau lay somewhere between onset and the ninth year of disease. Friberg et al\textsuperscript{6} reported that the frequency of attacks decreased after 20 years of disease, to 3 to 4 per year. We saw a small, statistically insignificant decline in frequency of vertigo attacks between the first and the fifth year, with no simultaneous decline in intensity or duration. The frequency of attacks was highest among patients who had had symptoms for more than 20 years, which was partly due to the high prevalence of continuous vertigo in this group; nevertheless, 36% of patients reported attacks 1 to 4 times per month. Haid et al\textsuperscript{13} reported vertigo attacks 1 to 4 times per month in 24% of their subjects; however, time since the onset of disease was not taken into consideration. According to the 12% occurrence of bilateral MD in their study, the mean duration since the onset of disease could be roughly estimated to be 10 years. In the corresponding group in our study, 18% of patients had attacks 1 to 4 times per month.

The mean age of 44 years at the onset of MD in our subjects is in agreement with previous reports. Although, the proportion of women in our study is higher than in many of the other studies,\textsuperscript{14,15} it is not likely to have had an influence on results concerning vertigo attacks since no statistical differences existed in intensity, frequency, or duration between sexes by duration of MD. Our study subjects were collected from a tertiary referral clinic that attends to patients with the most disruptive and persistent symptoms. Many patients are apparently freed from their vertigo attacks over time since there
were fewer patients in the subgroups with long disease duration than in the subgroups with shorter duration.

Consistent with earlier studies, we noticed that bilateral illness increased with duration of MD. After 10 and 20 years of illness, 12% and 43% of our study patients, respectively, had bilateral MD while the overall proportion of patients with bilateral disease was 16%. Our hospital is, however, a tertiary referral clinic, which cares for patients with the most severe symptoms, and 20% (n=49) of our sample had symptoms for more than 10 years. Thus, the high number of our patients with bilateral disease cannot be generalized to the MD population at large. Nevertheless, patients with bilateral disease did not experience more severe symptoms than those with unilateral disease. Moreover, time elapsed since the onset of symptoms might even explain the large variations in estimations of prevalence of bilateral disease reported by different authors.

Patients who had undergone endolymphatic sac surgery reported more disruptive vertigo symptoms than those who had not. Other studies have reported that endolymphatic sac surgery does not alter the long-term natural course of vertigo in MD, or that it only slightly modifies it. Patients with more severe symptoms are more likely to undergo surgery. However, a subgroup of patients exists with symptoms of dizziness even after 20 years of MD.

Submitted for publication February 24, 2003; final revision received September 4, 2003; accepted September 26, 2003.

Corresponding author and reprints: Mari Havia, MD, PO Box 220, 00029 HUS, Helsinki, Finland (e-mail: Mari.Havia@kolumbus.fi).

### Distribution of Patients in Different Symptom Categories Based on Duration of Ménie`re’s Disease*

<table>
<thead>
<tr>
<th>Time Since Onset</th>
<th>Frequency of attacks</th>
<th>Intensity of attacks</th>
<th>Duration of attacks</th>
<th>Side affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-2/y</td>
<td>Mild</td>
<td>1-15 s</td>
<td>Right</td>
</tr>
<tr>
<td></td>
<td>3-12/y</td>
<td>Moderate</td>
<td>15 s–5 min</td>
<td>Left</td>
</tr>
<tr>
<td></td>
<td>1-4/mo</td>
<td>Severe</td>
<td>5 min–4 h</td>
<td>Bilateral</td>
</tr>
<tr>
<td></td>
<td>2-7/wk</td>
<td>Very severe</td>
<td>4-24 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Several per day</td>
<td></td>
<td>1-5 d</td>
<td></td>
</tr>
</tbody>
</table>

*Ellipses indicate that data could not be computed.

### References


