Burden of vertigo at home: Risks for patients with vertigo

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Abstract

Objective: We aimed to clarify the burden of vertigo in patients’ homes.

Methods: This was a questionnaire survey among patients with vestibular vertigo. Four main questions were prepared. Q1: Where did you first notice vertigo? Q2: Where have you had the most difficulty with vertigo in your home? Q3: Where do you have difficulty at present? Q4: What household equipment have you used as a countermeasure to prevent further problems with vertigo?

Results: Sixty patients completed the questionnaire. Benign paroxysmal positional vertigo (BPPV) was most common among respondents, followed by Ménière’s disease. Q1: Most patients with BPPV first noticed vertigo in the bedroom; patients with other diseases first noticed vertigo in the living room. Q2: Both groups previously had the most difficulty with vertigo in the same locations as in Q1; these differences were significant between Q1 and Q2. Q3: Both groups had the most difficulty on stairs. Q4: Handrails were the most often used equipment for vertigo in both groups. There was no significant difference between Q3 and Q4.

Conclusion: Our data revealed that the locations of risks differ among patients with vestibular disorders. Handrails were considered the most important equipment to prevent problems with vertigo.

Keywords

Aging, benign paroxysmal positional vertigo, dizziness, household equipment, vertigo, vestibular disorders

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Introduction

Vertigo originating from vestibular disorders, such as benign paroxysmal positional vertigo (BPPV), is commonly encountered. Although some affected individuals complain of severe vertigo, these diseases are not fatal. However, these disorders can cause severe disequilibrium because patients tend to experience falls more often than their healthy counterparts. These conditions may result in various accidents involving head injuries, fractures, and other traumas.1–5 Such secondary accidents may cause severe sequelae. Therefore, in patients with vestibular vertigo, clinicians must pay special attention to secondary accidents owing to disequilibrium. However, risk factors in the home have not been thoroughly examined.

In this paper, we report the locations in the home where patients with vestibular disorders experience difficulty with and anxiety regarding vertigo. We also describe countermeasures used against vertigo in the patients’ homes.

Methods

Adult patients with vertigo who consulted with the Otolaryngology Department at Juntendo University Nerima Hospital were enrolled in this study. We included patients with peripheral vertigo; patients with vertigo originating in the central nervous system were excluded from this study. We also excluded patients who complained of any other symptoms during episodes of vertigo, such as faintness, paresis, dysarthria, and neurological symptoms with origins other than the inner ear and/or vestibular nerve. Among patients with vestibular vertigo, those with dementia were also excluded.

Using a questionnaire, we asked patients with vertigo and/or dizziness the following four questions.

Q1: Where did you first notice vertigo?
Q2: Where have you had the most difficulty with vertigo in your home?
Q3: Where do you have difficulty at present?
Q4: What household equipment have you used as a countermeasure to prevent further problems with vertigo? or “What household equipment do you think is required in the home to prevent further problems with vertigo?”

To obtain accurate data, we asked respondents to complete the questionnaire at home and submit the completed questionnaire inside an envelope. Results were compared according to each patient’s disorder.

Statistical analysis and ethical considerations

Statistical analysis was performed using JMP® 8 (SAS Institute, Inc., Cary, NC, USA). The incidence was analyzed using the \( \chi^2 \) test.

After explaining the purpose of this survey, written informed consent was obtained from all patients. The ethical institutional review board of Juntendo University Nerima Hospital approved this project (S 18-02).

Results

Sixty patients (16 men and 44 women) were asked to complete the questionnaire, and all patients returned a completed questionnaire. Patients were aged 33 to 86 years, and the median age was 71 years. The disorders among participants are listed in Table 1. The most common disorder was BPPV followed by Ménière’s disease.
We divided patients into two groups for comparison, those with BPPV and those with other vestibular diseases. Because the questions in this study were in the form of open questions, locations in the home, such as the living room, dining room, kitchen, and work space sometimes overlapped owing to the patient’s lifestyle; therefore, these locations were grouped together as “living room”. We divided the home into five locations: the bedroom, living room, lavatory, bathroom, and stairs.

**Responses to Q1**

Regarding the location of the first vertigo attack, participants reported that the bedroom and living room were the two most common locations in their home where they had their first vertiginous episode. Most patients with BPPV first noticed vertigo in the bedroom, whereas patients with other diseases tended to first notice vertigo in the living room (Figure 1).

**Responses to Q2**

As to the location where respondents had experienced the most problems with vertigo, both groups reported having difficulty in the same locations as in Q1. Patients with BPPV reporting having had the most difficulty in the bedroom, whereas other patients reported having had the most difficulty in the living room, dining room, kitchen, or work space. The second most problematic location reported by patients with BPPV was the bedroom, and this was the lavatory for the remaining patients. The differences were significant among patients with BPPV and those with other disorders (likelihood ratio: \( p < .005, p = .016 \), Figure 1).

**Responses to Q3**

Respondents in both groups stated that the location in their home where they currently had the greatest difficulty with vertigo was on the stairs. The second most problematic location was the bedroom for patients with BPPV and the lavatory for the remaining patients (Figure 2).

**Responses to Q4**

Both groups of respondents reported that handrails were the most important household equipment for preventing problems with vertigo. The second most frequently

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Table 1. Respondents and vestibular disorders.

|                  | Number of patients | Other vestibular vertigo | Number of patients |
|------------------|--------------------|--------------------------|--------------------|
| BPPV             |                    |                          |                    |
| Lateral semicircular canal/cupulolithiasis | 12                 | Ménière’s disease        | 25                 |
| Lateral semicircular canal/canalithiasis   | 4                  | Vestibular neuritis      | 3                  |
| Posterior canal  | 6                  | Delayed endolymphatic hydrops | 3            |
| Other            | 5                  | Other vestibular disease | 2                  |
| Total            | 27                 | Total                    | 33                 |

Note: Five patients with BPPV had atypical nystagmus. One patients had BPPV with origin in the anterior semicircular canal. The remaining patients had a typical history of BPPV, but did not show typical nystagmus originating in the posterior nor the lateral semicircular canal; these cases are listed as “Other”.

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reported equipment differed between groups: patients with BPPV stated that they used a chair and other patients responded that lighting was important. Concerning Q3 and Q4, there were no significant differences between the groups (Figure 2).

**Discussion**

Vestibular vertigo is very common in the clinical setting, and the lifetime prevalence of vestibular vertigo has been reported to be 7.8%.\(^1\)\(^-\)\(^3\) Although common, vestibular vertigo can present a heavy burden to those affected. The rate of missed work owing to vestibular vertigo is 40% and that owing to other types of vertigo is 14.7%.\(^3\) The reported rate of difficulty in daily life caused by vestibular vertigo is 18.5% and that caused by other vertigo types is 10.1%.\(^3\)

The results obtained in the present questionnaire survey revealed that patients with BPPV and those with other vestibular disorders showed differences in terms of the location in their home where vertigo was first noticed. Patients with BPPV reported having the most difficulty with vertigo in the bedroom. BPPV is triggered by sudden

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**Figure 1.** Responses for Q1 and Q2.
changes in the position of a person’s head. The symptoms of BPPV can strongly occur after the head has been in a stable position for a time. In contrast, other types of peripheral vertigo may be sustained for longer periods, and affected individuals may experience greater difficulty when they perform certain actions at home. For patients with sustained episodes of vertigo, such as those with Ménière’s disease or vestibular neuritis, lying in bed is a safe and comfortable position. The results of the question regarding past difficulties with vertigo experienced by respondents were consistent with the features of their respective disorders. Responses to the survey question addressing current problems with vertigo differed from the responses regarding past difficulties. Nearly half of patients reported currently having the most difficulty with stairs. In the present data, we did not ask whether respondents used stairs at home, and a certain percentage of patients likely did not have stairs in their dwelling. Stairs pose a high risk of falls for people who are experiencing dizziness. Interestingly, most respondents stated that handrails were necessary for dealing with vertigo.
Our included patients had vestibular disorders without the presence of paralysis and/or ataxia. Although study participants had disequilibrium owing to vertigo, their arms and trunk functioned normally. To compensate for disequilibrium, handrails may be the most effective equipment against vertigo.

As in people with vertigo, the above situations may occur in older populations. Aging societies are increasing worldwide, and the equilibrium of older people is decreased in comparison with that in younger groups. A survey among people aged ≥80 years revealed that 85% had experienced disequilibrium within the previous year. Ishikawa et al. reported that 20% of vertiginous patients with senility had experienced falls. In the present study, actual falls were not investigated, and 60% of patients were ≥70 years old. Among aging populations, the number of injuries owing to falls has been increasing. From 1970 to 1995, total hospitalizations owing to fall-induced injuries increased by 284% among people aged ≥50 years. Concerning fall-related injuries in older adults, one report found that individuals aged ≥85 years living in a detached house tended to fall more often than their counterparts who lived in an apartment. About 66% of older people in Japan live in an apartment whereas 26.8% live in a detached house. Asakawa et al. speculated that a detached house is more likely to have stairs, which might increase the rate of fall-related injuries.

Disequilibrium in older people presents a serious risk for fall-related accidents. Such accidents can lead to head injuries and/or fractures, resulting in the need to be bedridden. Our report suggested that installing adequate equipment, such as handrails, is important for preventing accidents and to improve safety at home among individuals with vertigo, as well as older people.

Conclusion
According to the results of the present questionnaire, the locations inside the home where respondents reported having the greatest difficulty differed between patients with BPPV and those with other vestibular disorders. In contrast, the type of household equipment used to prevent disequilibrium was the same in both groups. To compensate for a lack of balance, handrails were the most frequently used equipment among most patients with vestibular vertigo, as well as among older patients with vestibular disorders.

Declaration of conflicting interest
The authors declare that there is no conflict of interest.

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References
1. Yin M, Ishikawa K, Wong WH, et al. A clinical epidemiological study in 2169 patients with vertigo. *Auris Nasus Larynx* 2009; 36: 30–35.
2. Neuhauser HK, Radthe A, Von Brevern M, et al. Burden of dizziness and vertigo in the community. *Arch Intern Med* 2008; 168: 2118–2124.
3. Neuhauser HK, Von Brevern M, Radtke A, et al. Epidemiology of vestibular vertigo. A neurootologic survey of the general population. *Neurology* 2005; 65: 898–904.
4. Harun A, Semenov YR and Agrawal Y. Vestibular function and activities of daily living: analysis of the 1999 to 2004 National Health and Nutrition Examination Surveys. *Gerontol Geriatr Med* 2015; 1: 1–8.
5. Ishikawa K, Wong WH, Yin M, et al. Vertigo in elderly people: influence and some measurements on quality of life. *Equi Res* 2006; 65: 84–90. [in Japanese]

6. Kannus P, Parkkari J, Koskinen S, et al. Fall-induced injuries and deaths among older adults. *JAMA* 1999; 281: 1895–1899.

7. Asakawa Y, Takahashi R and Kagawa J. Falling accidents among metropolitan elderly resulting in emergency ambulance transfer. *Jpn J Geriatr* 2001; 38: 534–535.

8. Perry BC. Falls among the elderly: a review of the methods and conclusions of epidemiologic studies. *J Am Geriatr Soc* 1982; 30: 367–371.