CASE REPORT

A Habituation Approach to Treating Vertigo in Occupational Therapy

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This report describes the treatment of vertigo with the use of vestibular habituation training. This type of training is desirable because the patient can become functional in a short period of time without the use of medication. In the case described in this paper, the patient's quick return to function reduced her sense of helplessness and insecurity.

Vertigo is defined as an illusion of self-movement. Oscillopsia is defined as a sensation of the external world revolving around oneself. The patient in this study stated that she experienced a swirling motion of the environment and of herself. Vertigo and oscillopsia may result from a disease of the inner ear or may be due to disturbances of the vestibular centers or pathways in the central nervous system (Barber & Sharpe, 1988; Dix & Hood, 1984).

Case History

A 42-year-old woman with multiple sclerosis of 12 years' duration, which resulted in a residual weakness in all four extremities, sought treatment at the Rehabilitation Institute of Michigan in Detroit, complaining of light-headedness and marked ataxia. The physician ordered a complete oculomotor examination, with emphasis on labyrinthine function. The tests ordered were as follows:

1. Use of Frenzels lenses to observe subtle spontaneous or positional nystagmus.
2. Caloric tests to examine the function of the semicircular canals individually, by stimulating one ear at a time with warm and cold water, with the head in various positions.
3. Rotary chair tests to examine the vestibuloocular reflex under controlled parameters, with sinusoids and velocity steps of various frequencies and velocities.
4. Other tests of eye movements to examine the various oculomotor subsystems.

These tests were performed while eye movements were recorded objectively with the use of electrooculography, also known as electronystagmography. These tests of oculomotor function give information about the locus of the lesion, because lesions in different locations cause different kinds of deficits in oculomotor control (Cohen & Keshner, 1989).

The audiologist gave the patient a hearing test to screen for middle ear problems; tumors of the eighth nerve that could cause both auditory and vestibular symptoms; or Ménière disease, which also affects both auditory and vestibular sensation.

The test results showed nystagmus, or rhythmic movements of the eyes, on upward gaze. The patient was unable to hold this eye position and became extremely nauseated. She was also impaired in her ability to use smooth eye movements to watch a moving target bilater-
ally. Additionally, lying on her left side caused vertigo and nausea.

No other abnormalities were noted. Caloric responses were normal and equal bilaterally, suggesting a problem of the central nervous system rather than of the peripheral nervous system. No nystagmus was noted with eyes closed. A visual evaluation showed myopia.

During this admission, the patient’s symptoms were managed by medication and bed rest. She was discharged home with her mother with instructions to avoid those movements that would provoke dizziness. Because this limited her functional abilities, she eventually sought a second admission to the Rehabilitation Institute of Michigan.

As with her first admission, the patient’s primary complaints at the second admission were vertigo and fear of falling. These symptoms interfered with her performance of daily living activities. For example, she required maximal physical assistance for all transfers and could dress only from the waist up. She was dependent on her mother for home management and engaged in no leisure activities except watching television. She sat stilly and tended to turn her whole trunk to look sideways. Any increase in movement, either while seated or while standing, increased her anxiety.

Possible causes for the patient’s symptoms were explored during a team meeting and through a review of the literature on vertigo. Following the literature review, treatment was instituted.

### Literature Review

Cawthorne (1945) and Cooksey (1945, 1946) developed a set of exercises for vertigo to cause the patient to learn to habituate or adapt to the vertiginous stimulus. Patients perform gradual exercises to increase the range of motion through which they can tolerate head movements. This exercise program, called vestibular habituation training, consists of a series of 19 maneuvers that are repeated to gradually inhibit the vertigo. Vestibular habituation training is carried out for at least 5 min, three times daily for as long as the vertigo continues. Both Cawthorne and Cooksey recommended emphasis on the head positions and movements that cause vertigo. They claimed that the earlier and more regularly the exercise regimen is carried out, the faster and more complete the return to normal activity.

McCabe (1970) developed a similar habituation approach to treating vertigo. He encouraged patients to stimulate their vertigo whenever they could. He reported that by doing so, the patients could build a tolerance to and eventually inhibit the symptoms of vertigo. Like Cawthorne (1945) and Cooksey (1945, 1946), McCabe believed that if the vertigo is related to certain head positions, then the patient should place his or her head in that position repeatedly. The positions found to be the most difficult for the patient should be repeated until the patient is able to master and inhibit the symptoms.

Norré (Norré, 1987; Norré & Beckers, 1988; Norrë & DeWeerdt, 1980) used vestibular habituation training to treat patients with peripheral vestibular dysfunction, comparing it with drug and sham treatments (see Table 1). Provoked (positioning) vertigo resulting from lesions was treated with the use of individually selected exercises (i.e., vestibular habituation training). Dix (1979) designed a similar program.

All of these programs encourage active head movement. The patient is encouraged to move into the positions that cause the vertigo rather than avoid them and is to do this until he or she habituates to the vertigo or to tolerance for the stimuli. Not all vestibular diseases are amenable to treatment by the habituation approach, however (e.g., Ménière disease, benign positional paroxysmal vertigo).

### Table 1

Maneuvers of the Vestibular Habituation Test Battery

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Direction</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Midline</td>
<td>Sitting</td>
<td>Supine</td>
</tr>
<tr>
<td>M2</td>
<td>Left</td>
<td>Supine</td>
<td>Left side</td>
</tr>
<tr>
<td>M3</td>
<td>Right</td>
<td>Left side</td>
<td>Right side</td>
</tr>
<tr>
<td>M4</td>
<td>Midline</td>
<td>Supine</td>
<td>Sitting</td>
</tr>
<tr>
<td>M5</td>
<td>Right</td>
<td>Nose on left knee</td>
<td>Right ear on right shoulder</td>
</tr>
<tr>
<td>M6</td>
<td>Left</td>
<td>Nose on right knee</td>
<td>Left ear on left shoulder</td>
</tr>
<tr>
<td>M7</td>
<td>-</td>
<td>Turning to right</td>
<td>-</td>
</tr>
<tr>
<td>M8</td>
<td>-</td>
<td>Turning to left</td>
<td>-</td>
</tr>
<tr>
<td>M9</td>
<td>-</td>
<td>Turning head counterclockwise</td>
<td>-</td>
</tr>
<tr>
<td>M10</td>
<td>-</td>
<td>Turning head clockwise</td>
<td>-</td>
</tr>
<tr>
<td>M11</td>
<td>-</td>
<td>Bending forward</td>
<td>-</td>
</tr>
<tr>
<td>M12</td>
<td>-</td>
<td>Going from sitting to erect standing position</td>
<td>-</td>
</tr>
<tr>
<td>M13</td>
<td>-</td>
<td>Moving head forward and back</td>
<td>-</td>
</tr>
<tr>
<td>M14</td>
<td>Left</td>
<td>Sitting</td>
<td>Head hanging and turned to the left</td>
</tr>
<tr>
<td>M15</td>
<td>Left</td>
<td>Sitting</td>
<td>Head hanging and turned to the right</td>
</tr>
<tr>
<td>M16</td>
<td>Right</td>
<td>Sitting</td>
<td>Head hanging in midline</td>
</tr>
<tr>
<td>M17</td>
<td>Right</td>
<td>Sitting</td>
<td>-</td>
</tr>
<tr>
<td>M18</td>
<td>Midline</td>
<td>Sitting</td>
<td>-</td>
</tr>
<tr>
<td>M19</td>
<td>Midline</td>
<td>Sitting</td>
<td>-</td>
</tr>
</tbody>
</table>

Vestibular Habituation Training in Occupational Therapy

To implement the habituation approach to vertigo in the patient’s occupational therapy program, I incorporated into functional activities head and body movements graded from less demanding to more demanding. The sequence of activities is described below.

Reaching activities. The patient reached for objects overhead, forward, and backward. The head-down position was facilitated by the patient’s passing a ball between her knees, an activity that initially was difficult for her. The patient practiced the same position while donning and removing pants and shoes and while performing light household activities.

Standing. Support was provided as the patient rose and descended from a wheelchair or armless chair with her eyes open. The patient was unable to perform the activity when her eyes were closed due to her fear of falling and complaints of vertigo and nausea. She was allowed to rest, and then the activity was repeated.

Ambulation. When the patient was comfortable with the standing activities, she began ambulating on level surfaces with a standard walker.

Picking up objects. The final step in the patient’s habituation program was for her to lean over to pick up lightweight objects from the floor.

Results

After 4 weeks of daily occupational therapy sessions of 1 to 2 hr in duration, the patient’s movements became more spontaneous, which was reflected in her activities of daily living. She was independent with transfers, with hygiene and dressing, and in using adaptive devices. She performed light kitchen tasks independently and safely. Her fearfulness abated and she stated, “It feels good to be able to do things myself instead of depending on my mother.” The patient’s mother was taught how to work with her daughter in the home to maintain the patient’s skills and reinforce her positive behavior. I recommended that the patient perform activities of daily living at the appropriate times, be allowed additional time to complete activities before being assisted, and be given praise for her accomplishments.

Summary

Before occupational therapy, the patient’s basic and advanced activities of daily living were hindered by her vertigo, causing her to become housebound and to believe that she would never walk again. These feelings brought on a sense of insecurity and helplessness. Vestibular habituation training helped reduce the symptoms. The patient’s performance of activities of daily living improved from dependence to independence and restored her self-esteem as she gained more control over her daily functions.

I recommend vestibular habituation training as part of treatment of vertigo because desired results can be obtained relatively quickly without the use of medications that may have harmful side effects. In a complicated case such as the one presented in this paper, it is particularly desirable to avoid any medications that might further depress the patient’s nervous system. Patients also benefit by actively participating in their own rehabilitation treatment. The necessary habituation stimuli can be incorporated into daily activities as well as into exercises. This combination of active patient participation and integration of therapeutic exercise into performance of daily living tasks is the essence of good occupational therapy.

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References


Editor’s Note. To continue the Case Report department, we need and welcome reports that document the practice of occupational therapy for specific clinical situations. Guidelines for writing case reports are available from the Editor.