Complementary and Integrative Treatments Balance Disorders

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KEYWORDS

• Integrative • Balance disorder • Acupuncture • Holistic • Vertigo
• Complementary therapy

KEY POINTS

- Antihistamines, benzodiazepines, anticholinergics, calcium channel blockers, neuroleptics, and antidepressants all may achieve reduction in the length and severity of dizzy spells. Their use is not recommended long-term.
- Vestibular rehabilitation therapy is a program of physical therapy designed to habituate symptoms and promote adaptation to various deficits engendered by an array of balance disorders.
- Several essential micronutrients are vital for proper balance; therefore identification and supplementation of deficiencies are crucial for patients with symptoms of balance disorders.
- Acupuncture may be used for patients with Menière disease and for relief of vertigo.
- Tai chi has been studied as an aid to improving balance, and studies suggest that it can reduce falls or risk of falls.
- Osteopathic manipulative therapy has been described for disorders of dizziness and balance.
- Cognitive-behavioral therapy, with its emphasis on challenging distorted thinking to change maladaptive behavior, has been recommended as an adjunct to vestibular rehabilitation. Dialectical behavior therapy, which incorporates mindfulness, has been helpful in difficult or treatment-resistant cases.

Funding Sources: None.
Conflict of Interest: None.
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Otolaryngol Clin N Am 46 (2013) 409–422
http://dx.doi.org/10.1016/j.otc.2013.02.006 **oto.theclinics.com**
0030-6665/13/$ – see front matter

OVERVIEW

Balance disorders are the ninth most common reason that patients seek medical care from their primary care doctors, and result in 2 million office visits annually.[1] The balance system is complex, integrating the functions of the vestibular, visual, and proprioceptive systems. A dysfunction in any of these may result in imbalance.[2] Imbalance disproportionately affects elderly individuals, and dizzy complaints are the chief reason why persons older than 75 years seek medical attention. Falls are the leading cause of serious injury and death in those older than 65 years.[3] New research points out that changes in gait and balance may be the earliest signs of Alzheimer disease or incidental dementia.[4]

PHYSIOLOGY AND ANATOMY

Balance is defined as the ability of the body to maintain its center of mass over its base. Its ability to do so also encompasses being able to judge direction and speed of movement and orientation with respect to gravity. It allows us to see clearly when we are moving and make adjustments in our posture, resulting in stability in a variety of environments.

In humans, the balance system comprises 3 parts:

- a peripheral sensory apparatus
- a central processor
- a motor output mechanism

Peripheral sensors include the vestibular organs as well as the eyes and the muscles and joints. The vestibular labyrinth contains 2 types of sensors: the semicircular canals and the otolith organs. There are 3 paired semicircular canals:

- the horizontal
- superior
- posterior

They are roughly orthogonal to one another and sense angular velocity of the head in their respective planes. For example, lateral motion of the head stimulates the horizontal canals, whereas up and down motion stimulates the vertically oriented canals. The canals are housed in the dense bony labyrinth of the temporal bone and contain perilymph, which has a composition similar to cerebrospinal fluid (CSF) with a high sodium/potassium ratio. Perilymph is in communication with CSF via the cochlear aqueduct, and therefore disorders of CSF pressure may affect inner ear function.

Inside the bony labyrinth and suspended in the perilymph is the membranous labyrinth, which is filled with endolymph and has an opposite composition to CSF, with a high potassium/sodium ratio. An enlarged area within each canal, the ampulla, contains a gelatinous cupula matrix, which completely seals the canal. Movements of the head trigger deformation of the matrix material and cause underlying specialized hair cells to activate, sending signals to the vestibular nerve. The otolith organs (the utricle and saccule) are similarly housed. They sense linear acceleration in a left and right orientation and up and down, respectively. Maculae are the sensory transduction means in these organs. An otolithic membrane contains tiny crystals of calcium carbonate, or otoconia, overlying hair cells. Deformation of this membrane by linear acceleration or change of orientation with respect to gravity induces electrical changes within the hair cells, which leads to signaling through the vestibular nerve. These otoconia are constantly being reformed and absorbed by the macular