

"THE FALL AND FRACTURE SYNDROME"

WHAT OPHTHALMOLOGISTS CAN DO TO IMPROVE THE LIVES OF THE ELDERLY WITH DISEQUILIBRIA.

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The literature is exhaustive in documenting the degree of personal suffering and financial loss caused by falls in the elderly. The National Institute of Health reports that 42% of the current American population or approximately 90 million people, will complain to their doctor of dizziness. Annually, 6 million Americans seek medical attention because of disequilibria, balance or vertigo. The aging population is at significant risk for falls and it is estimated that in patients over the age of 65, the fall rate exceeds 40% annually. It has also been observed that falls are the leading cause of death from injuries in those over age 65.

As an ophthalmologist viewing balance and disequilibria, one wonders why ophthalmology has been marginalized with regard to helping the patient with disabilities of balance and equilibrium. This is especially intriguing since most ophthalmologists deal with a large geriatric population. How can ophthalmologists help elderly patients with their age related balance disorders? First, the magnitude of the problem needs to be understood as well as the overall impact of "falls and fractures" on society at large. Second, we need to appreciate the incidence of balance disorders in our own population of elderly patients. Third, it is necessary that we understand our valuable role in the diagnosis, treatment and interrelationships with rehabilitation services that are available under our supervision. Fourth, ophthalmologists need to reassess those areas in our training where neuro-ophthalmological skills were first obtained and to learn what assessment modalities are now available to us and to our colleagues.

Traditionally, balance disorders have been referred to otolaryngology and

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neurology, not ophthalmology. Usually this is after the patient has originally presented to their primary care provider who has performed the appropriate history and physical and completed a diagnostic work up to rule out cardiogenic, medicamentosa, or significant central nervous system pathology with MRIs and CT scans. Often, the primary care provider has initiated a trial of symptom suppressing medications (i.e. Antivert, etc.) for the acute management of the vertiginous symptoms on an episodic basis. While this may help control the patient's anxiety producing symptoms of dizziness and imbalance, they may in fact be increasing the patient's risk of "fall and fracture" by actually suppressing the valuable function of the vestibular system.

Balance is the result of complex interactions between vision, proprioception, and labyrinthine (vestibular) function and is modulated by equally complex central nervous system controls via frontal eye fields in the dorsolateral frontal lobe and the pursuit centers in the parieto-occipital cortex and their cerebro-pontine integration via the medial longitudinal fasciculus with its circuitry with the third, fourth and sixth ocular motor nuclei in the brain stem.

Except for the anatomical merging of the vestibular branch of the eighth cranial nerve with the cochlea branch, and the physical relationship of the labyrinth and shared endolymph with the cochlea, there is no unique relationship with "hearing"

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and balance. Whereas there is a vast central nervous system and peripheral vestibular system complex of sensory and compensatory brain components directly and integrally encompassed by visual physiology and neuro-ophthalmology.

In fact, it might be argued that the labyrinth itself (vestibule, ampule, saccule, cupula, and semicircular canals) is an accessory sensory organ more appropriately associated with the oculo-vestibular balance system than to the hearing system, as it has little to do with hearing, but rather is nearly one hundred percent related to assisting the ocular motor system in maintaining balance.

Ophthalmologists must take a more proactive role in the evaluation and management of patients with disequilibrium of any etiology. It could be argued that few patients have fallen, broken a hip, had to endure surgery and rehabilitation or possibly developed a complication leading to death, as a result of a hearing loss. Granted, a disease or injury to the eighth cranial nerve could certainly contribute to vestibular pathology, but only by the disruption of the vestibular nerve component in co transit with the cochlea nerve in the merged neuro bundle (CNVIII). The otologist studies and treats the labyrinth because of its proximity to the ear, not uniquely because it is involved in hearing; yet his involvement in balance medicine is largely predicated on labyrinthine influences on the ocular motor pathways and neuro-ophthalmologic integration of that portion of the balance system.

Whereas we do not expect hearing loss to have a high association with "fall and fracture", lost or reduced vision is a major risk factor in balance disorders. Diseases that diminish visual acuity in the elderly, such as cataracts, glaucoma and macula degeneration certainly contribute to the increased risk of the "fall and fracture" syndrome, just as do the loss of the integrity of the central organ, cerebellum, motor skills, cognitive abilities and memory. Further, the presence of psychiatric and anxiety disorders may also

contribute to the risk. Therefore, as physicians who encounter increasingly larger numbers of elderly patients, our focus must be on preventive care, especially in the area of preventing the "fall and fracture syndrome".

Ophthalmologists, as other physicians assisting the elderly, should include in their history and physicals the assessment of dizziness and balance complaints. A comprehensive review of systems will hopefully reveal that the patient's primary care physician has completed an assessment and has ruled out cardiogenic, medicamentosa or significant central nervous system diseased as a cause for their disequilibrium.

Neuro-ophthalmic evaluation (as part of a comprehensive ophthalmologic medical practice) certainly encompasses one of the essential testing modalities for evaluating the central and peripheral vestibular systems; i.e. electronystagmography (ENG). ENG is an evaluation based 100% on observations of and the neuro-electrical activity generated by eye movement, nystagmus, and CNS centers involved in coordinated eye movements. The level of knowledge gained by this patient friendly, computer driven neuro-ophthalmologic testing, provides critical data for evaluation and for localization fo the causes of disequilibrium. The data obtained from ENG testing can guide the physician in prescribing appropriate management options (i.e., medication, observation, surgical or vestibular rehabilitative therapy).

Ophthalmologists can and should be at the forefront of bringing balance back into our senior patients' lives. Our training prepares us for the assessment of nystagmus and balance and with the ability to develop treatment plans, where medically necessary, to be administered by certified and highly qualified balance physical therapists and occupational therapists.

We can reduce the incidence of the "Fall and Fracture Syndrome" and help maintain a better quality of life for the aging population whom we have the privilege and honor to call our patients •◆