

Visual Deficits in the Elderly

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This article will describe the major visual deficits that occur with aging. They are correctable and treatable deficits but if unrecognized and treated have serious negative consequences for the independence and quality of life of older adults. The deficits that will be described include cataracts, presbyopia, glaucoma, macular degeneration, and diabetic retinopathy.

The Significance of Vision

There is a rapid increase in eye pathology with age (Harwood, 2001). Studies indicate that the rates of eye disease and visual impairment among personal care home (PCH) residents is significantly greater than any other segment of the population, including non-institutionalized persons in the same age group (Morer, 1994). Through various studies, the high prevalence rates of vision problems in PCH residents may imply that visual impairment is an unrecognized factor contributing to nursing home placement (van der Pols, *et al.*, 2000). According to statistics, vision impairment among many PCH residents range from 21 to 52% (Leonard, 2002). A study by Evans and Rowlands (2004) found that residents in PCH are 3.3 times more likely to have visual impairment than those not residing in the PCH setting.

Visual deficits in the PCH resident include both correctable and treatable disorders. Organic peripheral changes which occur inside the eyeball, such as cataracts and refractory issues including presbyopia, are correctable deficits related to normal aging changes. As well, glaucoma, macular degeneration, and diabetic retinopathy occur with aging and are treatable diseases of the eye (Horowitz, 1997). These visual deficits cause visual sensory impairments and reductions in health related quality of life, including difficulties in daily tasks, falls, fractures and psychosocial problems (Jackson & Owsley, 2003).

The major visual deficits prevalent in the elderly are correctable and preventable.

- cataracts
- presbyopia
- glaucoma
- macular degeneration
- diabetic retinopathy

Visual perceptual problems result from aging-related changes in the optics in the eye and degeneration of the visual neural pathways. These result in impairments in visual acuity, contrast sensitivity, colour discrimination, temporal sensitivity, motion perception, peripheral visual field sensitivity, and visual processing speed (Jackson & Owsley, 2003).

The vast continuum that exists between normal vision and blindness includes the area of low vision. More than 90% of adults experiencing vision decline in later life do not lose all useable sight (Harwood, 2001). Blindness and visual impairment are highly prevalent among PCH residents. This reduction in vision can be treated or prevented with appropriate ophthalmologic care (Tielsch, Javitt, Coleman, Katz, & Sommer, 1995). Providing access to vision care for diagnoses and treatment of visual deficits improves the quality of life for the elderly who reside in the PCH setting by decreasing falls, fractures, disruptive behaviours, depression, and cognitive impairment (Carnicelli, 2001).

Understanding the type of vision impairment that occurs with each disorder is important as each has a different impact on daily life (Harwood, 2001). As each deficit is described, the nurse has the ability to gain an understanding of the impact of the deficit on the resident's quality of life and develop appropriate care plans.

Vision plays an important role in balance, mobility and falls, and the standing balance in the older person. Studies indicate that when vision is improved, there is an improvement in balance and a decrease in the number of falls (West *et al.*, 2003). Visual impairment and an aging population leads to the loss of mobility and an increase in care services due to dependency issues related to vision loss (Das, 1999).

Visual Deficits

Cataracts

Cataracts are the leading cause of blindness in the PCH population (Public Health Task Force for Vision and Ophthalmology, 2000). The prevalence of cataracts increases with age from less than 5% in persons under 65 to approximately 50% in those 75 years of age and older. Although there is no universally accepted definition, "cataract" generally refers to lens opacities that interfere with vision function. A clouding of the normally clear and transparent lens of the eye occurs which reduces the passage of light to the retina. Vision becomes hazy or blurry and the eye becomes more sensitive to light (Stuen & Faye, 2003). Cataract surgery is considered when the cataract reduces vision function to a level that interferes with everyday activities. The potentially blinding effect of cataracts among the elderly is dramatically reduced because of the success obtained through cataract surgery. Over 90% of patients undergoing cataract surgery experience visual improvement and improved quality of life if there is no ocular comorbidity (Monestam & Wachmeister, 2004). Cataracts have a direct relationship with the incidence of falls in the elderly. In a study on the rates of falls before and after cataract surgery, the results demonstrate a significant reduction in the risk of falls after cataract surgery (Brannan *et al.*, 2003).

Presbyopia

Presbyopia, a refractive error, is caused by an age-related process and is generally believed to stem from a gradual loss of flexibility in the natural lens inside the eye. The age-related changes occur within the proteins in the lens, making the lens harder, denser, more yellow and less elastic. Age-related changes also take place in the muscle fibers surrounding the lens. These changes result in a loss of focusing ability when viewing objects at near distances (Jackson & Owsley, 2003; Quillen, 1999; Stuen & Faye, 2003).

Eyeglasses with bifocal or progressive addition lenses (PALs) or multifocal lenses are the most common correction for presbyopia. These lenses provide acuity for both near and far vision. As the elderly person looks down through the lens, close

up vision is corrected; as they look through the centre of the lens, distance vision is corrected. With progression lenses, there is a midway point within the lens that provides correction for vision while looking at a computer screen. Multifocal lenses impair depth perception (stereopsis) and edge contrast sensitivity which may contribute to falls in the elderly. It is suggested multifocal lenses not be worn by the elderly when they are walking in order to prevent falls and fractures (British Geriatrics Society, n.d.). The human lens continues to change as we grow older and the presbyotic prescription will become more commonplace over the next 10 to 20 years. Surgical alternatives are being explored as long term or permanent options (Quillen, 1999).

Glaucoma

Glaucoma is often referred to as the 'sneak thief of sight' because no symptoms usually appear until serious damage has occurred. Glaucoma causes excessively high eye pressure which damages the optic nerve, affecting peripheral vision and causing permanent loss of sight. Age is included as the primary risk factor for glaucoma as well as African ancestry, family history, diabetes, and being very near sighted (Stuen & Faye, 2003). Seventy-five percent of persons who are legally blind due to glaucoma are over the age of 65 (Quillen, 1999). Early detection and treatment are very important to prevent vision loss. Peripheral visual field loss occurs early in the glaucoma process with central vision being affected later in the disease process. The American Academy of Ophthalmology recommends that the elderly have comprehensive eye examinations every one to two years in order to evaluate intra-ocular pressure and the optic discs as well as formal visual field testing to detect early glaucoma.

Treatment for glaucoma ranges from eye drops to surgery. Since central vision remains intact with treated glaucoma, reading is generally not a problem. Orientation and mobility training may be very critical for the elderly with advanced glaucoma, who only have a pinhole vision after having lost significant peripheral vision (Stuen & Faye, 2003). Blindness from glaucoma could be reduced by 49-70% with appropriate treatment. Research supports corrective procedures for vision loss and its association to decreases in falls, fractures, disruptive behaviours, and depression (Public Health Task Force in Vision and Ophthalmology, 2000).

Macular Degeneration

Age-related macular degeneration (AMD) is the leading cause of vision loss in people over 65 years of age. The symptoms of AMD include blurred vision, image distortion, central scotoma,

and difficulty reading (Stuen & Faye, 2003). AMD damages the macula, the central part of the retina, which is responsible for central vision and the ability to see detail. Ninety percent of AMD among older adults is the 'dry' form which progresses slowly but results in spotty loss of detail. About 10% of people with AMD develop the 'wet' type, which can come on very suddenly as a result of leaking blood vessels that have grown under the retina. The most frequent complaint of people with macular degeneration is difficulty reading or inability to read — parts of letters may appear to be missing and straight lines may appear crooked. The loss of central vision is particularly apparent in AMD (Stuen & Faye, 2003). A person with AMD who looks at someone who is talking to them is unable to see the face of the person, but can see the background surrounding their head.

There is no medical treatment currently for dry AMD. There are two treatments for wet AMD. Photocoagulation is a surgical procedure utilizing hot laser treatment to seal or slow the progression of abnormal blood vessels. The second treatment is photodynamic therapy, which uses a cold laser along with an intravenous, light sensitive drug to halt or slow the progression of abnormal blood vessel growth. High doses of zinc and antioxidant vitamins can help maintain healthy cells and tissues in the eye and have a positive effect on the progression of AMD (Stuen & Faye, 2003). Although vision may become severely impaired, it is important to reassure residents with loss of vision related to AMD that complete blindness is not associated with this condition. Low vision aids, such as hand-held magnifiers, may be helpful in enhancing a person's ability to perform activities requiring fine visual acuity (Quillen, 1999).

Diabetic Retinopathy

Diabetic retinopathy is a significant cause of vision morbidity in the elderly population. This condition can develop as a complication of diabetes. Good control and management of diabetes can delay onset, but retinopathy cannot be prevented. Retinopathy results from a breakdown of the blood vessels of the retina. These damaged blood vessels leak fluid or blood into the eye, causing retinal scars that distort vision or create blind spots. People with retinopathy may describe their vision as splotchy with fluctuations in vision that can occur on a daily basis from nearly normal to very blurred, distorted, or partially blocked (Stuen & Faye, 2003). Retinopathy may be present in the elderly at the time of diagnosis of diabetes or during the first few years of diabetes.

Panretinal laser photocoagulation can reduce the risk of severe vision loss by more than 50% for persons with 'proliferative'

diabetic retinopathy. This type of retinopathy is characterized by the proliferation of newly formed blood vessels from the optic disk, retina or iris as the result of widespread retinal ischemia. 'Non-proliferative' diabetic retinopathy is characterized by abnormalities of the retinal circulation, including micro-aneurysms, intra-retinal hemorrhages, retinal edema, and exudates. The most common cause of vision loss in non-proliferative retinopathy is macular edema. Central vision may become blurred or distorted. It is recommended that elderly patients undergo eye examination with dilation at the time of diagnosis of retinopathy with follow-up examinations on a yearly basis and more frequently if significant retinopathy is detected (Quillen, 1999).

Impact

Vision impairment has been identified as one of the four leading causes of lost independence among older people (Alliance for Aging Research, 1999). Treating and correcting visual deficits has proven to have a positive impact on falls, fractures, depression, behavioural issues as well as cognitive impairment in the PCH resident (Carnicelli, 2001). As the number of people 65 years and older increase, so will the incidence of visual deficits. Interventions must be implemented in order to identify and treat these visual deficits in the PCH resident, which impact on falls, fractures, depression, cognitive impairment and behavioural issues (Carnicelli, 2001).

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