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Vision Impairment and the Increased Risk of Recurrent Falls in the Elderly

Elio Arruzza*

Nursing Department, Clinical Hospital of University of Campinas, Campinas, Brazil

Abstract

Falls are the second leading cause of accidental deaths worldwide mainly in older people. Older people have poor vision and published evidence suggests that it is a risk factor for falls. Less than half of falls clinics assess vision as part of the multi-factorial assessment of older adults at risk of falls despite vision being an essential input for postural stability. The aim of our study was to investigate the relationship between all clinically assessed visual functions and falls amongst older adults in a prospective observational individually age-matched case control study.

Visual acuity (VA), contrast sensitivity, depth perception, binocular vision and binocular visual field were measured using routinely used clinical methods in falls participants and non-falls participants. Data were also collected on socio-demographic factors, general health, and number of medications, health quality and fear of falling and physical activity. Logistic regression analysis was carried out to determine key visual and non-visual risk factors for falls whilst adjusting for confounding covariates. The results concerning the relationships between poor visual acuity and poor contrast sensitivity and the risk of recurrent falls are controversial. More studies about the relationships between different measures of vision and the risk of recurrent falls are needed before final conclusions about poor vision as a risk factor for recurrent falling can be done.

Keywords: Contrast sensitivity; Depth perception; Falls; Social determinants; Vision

Introduction

The eyes are a vital organ that allows us to experience the world around us. Unfortunately, they are susceptible to various diseases and conditions that can lead to impaired vision or even blindness. While many factors contribute to the development of eye diseases [1], recent research suggests that impaired vision itself could be a risk factor for certain ocular conditions. In this article, we will explore the connection between eye diseases and impaired vision, shedding light on the importance of early detection and intervention. Cohort studies have reported an increased risk of falls associated with a decline in visual acuity (VA) and contrast sensitivity. However, there are few reports of a significant association between reduced depth perception and falls [2].

Postural stability is achieved by adequate input from the visual, vestibular and somatosensory systems, processing of the information by the cortex, and finally an efficient motor response of the muscles, joints and reflexes. A deficit in any of the sensory systems may affect balance and potentially put an individual at risk of falls. The performance of the visual system is dependent on different visual functions operating at optimum level [3]. It is not judged on simply resolving the smallest high contrast object at the furthest distance as in widely used standard measures of VA, but additional measures of visual function such as contrast sensitivity, visual field, and binocular vision are also involved.

The National Falls Prevention Coordination group recommends a whole system approach in their fall and Fracture Consensus Statement and the National Institute of Clinical Excellence recommend that older adults have a multifactorial risk assessment including a vision assessment to reduce their risk of falls [4]. A national survey of falls services reported that only 54% of professionals checked vision as part of their service.

Cohort studies have reported an increased risk of falls associated with a decline in visual acuity (VA) and contrast sensitivity (CS). However, there are few reports of a significant association between reduced depth perception and falls. Postural stability is achieved by adequate input from the visual, vestibular and somatosensory systems, processing of the information by the cortex, and finally an efficient motor response of the muscles, joints and reflexes [5]. A deficit in any of the sensory systems may affect balance and potentially put an individual at risk of falls. The performance of the visual system is dependent on different visual functions operating at optimum level. It is not judged on simply resolving the smallest high contrast object at the furthest distance as in widely used standard measures of VA, but additional measures of visual function such as contrast sensitivity, visual field, and binocular vision are also involved.

The Link between eye diseases and impaired vision

Age-related macular degeneration (AMD)

Age-related macular degeneration is a leading cause of vision loss among older adults. Studies have found that individuals with impaired vision [6], particularly those with visual acuity problems, are at a higher risk of developing AMD. This connection highlights the importance of regular eye examinations to detect early signs of the disease and initiate appropriate interventions.

Glaucoma

Glaucoma is a group of eye diseases that damage the optic nerve, often leading to irreversible vision loss. Impaired vision, such as decreased peripheral vision or blurred vision, can be an early symptom of glaucoma [7]. Timely diagnosis and treatment can help manage the disease and preserve vision.

***Corresponding author:** Elio Arruzza, Nursing Department, Clinical Hospital of University of Campinas, Campinas, Brazil, E-mail: Arruzaeilo26@ry.gmail.com

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Cataracts

Cataracts occur when the lens of the eye becomes cloudy, causing blurred vision and eventual visual impairment. While cataracts can develop due to various factors [8], studies suggest that individuals with pre-existing visual impairments may be more susceptible to developing cataracts. Regular eye exams can help detect cataracts early on and enable appropriate surgical intervention.

Diabetic retinopathy

Diabetic retinopathy is a complication of diabetes that affects the blood vessels in the retina, leading to vision impairment. Studies indicate that individuals with impaired vision due to other causes, such as refractive errors or cataracts, may have an increased risk of developing diabetic retinopathy [9]. Maintaining optimal blood sugar levels and receiving regular eye screenings are essential for individuals with diabetes to prevent and manage this condition.

Refractive errors

Refractive errors, including nearsightedness, farsightedness, and astigmatism, cause blurry vision and difficulty focusing. While refractive errors themselves do not lead to eye diseases [10], individuals with uncorrected vision problems may be more prone to accidents or injuries that can damage the eyes, increasing the risk of developing other ocular conditions [11].

Early detection and intervention

The relationship between impaired vision and eye diseases underscores the importance of early detection and intervention. Regular eye examinations, especially for individuals with visual impairments, are crucial to identify any potential eye diseases at an early stage [12]. Prompt diagnosis allows for timely treatment and management strategies, which can significantly improve outcomes and preserve vision.

Conclusion

Eye diseases and impaired vision are intricately linked, with one often acting as a risk factor for the other. Understanding this connection emphasizes the need for proactive eye care, including regular check-ups, prompt treatment of vision problems, and appropriate interventions. By prioritizing eye health and seeking timely medical attention, we can mitigate the risks associated with eye diseases, safeguard our vision, and maintain a good quality of life. Remember, your eyes are precious, so take care of them diligently. The combination of social, behavioural and biological determinants is significant predictors of a fall. The non-visual risk factors include older adults, living in deprived neighborhoods, socializing less outside of the home and those who have a hearing impairment. Impaired functional visual measures; depth perception and contrast are significant visual risk factors for falls above visual acuity.

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