

Circumstances, locations, and outcomes of falls in patients with glaucoma

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Purpose: Glaucoma is associated with an increased risk for falls due to visual field (VF) loss and poor contrast sensitivity (CS). In this prospective, observational study, we characterize the circumstances, locations, and outcomes of falls in patients with glaucoma.

Methods: Patients aged 57 years or older receiving care for suspected or diagnosed glaucoma filled out monthly calendars to report any falls. After each reported fall, a 30-item questionnaire was administered to determine the fall location, circumstances, and resulting injury (if any). Falls from September 2013 through May 2016 were included for analysis. Humphrey 24-2 VFs were obtained to calculate average integrated VF sensitivity, a measure of disease severity.

Results: One-hundred forty-two patients experienced a total of 330 falls. Mean baseline age was 71.3 years, and approximately half of participants were male (45.1%). Average duration of follow-up was 24.5 months, and patients fell an average of 2.3 times during the study period; there was no difference in the mean number of falls by severity of VF loss (normal, mild-moderate, or severe). Vision issues were cited as a direct cause in 15.9% of falls. Falls were slightly more common indoors (50.3%), and the most common location for indoor falls was the patient's home (117/166 falls, 70.5%). The stairs (29 falls, 24.8%) and bedroom (22 falls, 18.8%) were the most common home areas for falls. Among outdoor falls, 73 (44.5%) occurred within the vicinity of the home (e.g. driveway, yard). There was no difference in fall location across the three levels of VF loss ($p > 0.20$ for all). Overall, 143 of 330 total falls (43.3%) resulted in some injury, with 15 falls (4.5%) resulting in a fracture and 11 falls (3.3%) resulting in a hospital admission. Patients with more medical comorbidities were more likely to experience an injurious fall (odds ratio 1.41, $p = 0.001$). Neither severity of VF nor CS loss predicted whether a fall would be injurious ($p > 0.56$ for both).

Conclusions: Several participants fell multiple times during the study period, and the majority of falls occurred within or near the home environment. Nearly half of all falls resulted in injury, though severity of visual impairment did not predict whether a fall would be injurious. Interventions to prevent falls should focus on the home environment and be directed toward all individuals who are at increased risk of falling, regardless of glaucoma severity.