

The Literature

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GLAUCOMA AND ASSOCIATED VISUAL ACUITY AND FIELD LOSS SIGNIFICANTLY AFFECT GLAUCOMA-SPECIFIC PSYCHOSOCIAL FUNCTIONING

Chan EW, Chiang PPC, Liao J, et al¹

ABSTRACT SUMMARY

Chan et al reported a cross-sectional study comparing psychosocial functioning (PF) between 192 patients who had bilateral glaucoma with visual acuity (VA) or visual field (VF) losses and 40 controls. Four psychosocial outcomes of the Glaucoma Quality-of-Life 36-item questionnaire were psychometrically evaluated in order to assess the impact of glaucoma, VA, and VFs on PF. The main outcome measures included anxiety, self-image, psychosocial well-being, and confidence in health care—the only domains from this questionnaire pertaining to PF.

The participants' mean age was 66.2 ± 11 years, and 63% were male. The VA in the better-seeing eye and mean deviation were Snellen 20/25 and -8.89 ± 6.52 dB, respectively. In multivariate models, glaucoma patients had 63% greater anxiety ($P < .001$), a 71% lower self-image ($P < .001$), 38.3% less psychological well-being ($P < .001$), and 32.4% reduced confidence in health care ($P < .001$) compared to controls. The worst VA and VF categories had the most reduced PF (range, 26%-81.5%; $P < .001$ for all associations). Worsening VA was associated with a linear increase in anxiety ($P = .003$) and decrease in self-image ($P = .005$). Worsening VFs from 0 to -12.1 dB ($P = .003$) was associated with increased anxiety before eventually plateauing. Self-image and confidence in health care also decreased when VFs worsened from 0 to -10 dB ($P < .001$) and from 0 to -9.3 dB ($P = .008$), respectively, but actually improved at greater levels of VF loss beyond these thresholds.

DISCUSSION

How does PF differ from vision-specific functioning?

Psychosocial functioning refers to the psychological and social effects of a disease on a patient, and it represents a key aspect of the World Health Organization's conception of health-related quality of life, which in ophthalmology has focused on vision-specific activities, including mobility, reading, and driving. These tasks are distinctly different from the psychological, social, and emotional aspects of a disease, and reduced PF is an increasingly recognized clinical consequence of chronic diseases that adversely affects

an individual's overall physical and mental health.²⁻⁴ PF and vision-specific functioning are interdependent. Daily functioning—including the use of topical medications, mobility, and driving cessation—are strongly affected by glaucoma,⁵ and understanding the extent to which PF is linked to activity limitation may be important for developing targeted strategies by which to help glaucoma patients improve their PF.

How is PF affected in early versus late stages of glaucoma?

In this study, glaucoma patients scored lower on all four outcome measures, even after adjusting for sociodemographic and health factors compared with controls. The results indicate that, in the early stages of glaucoma, when VF loss is mild, anxiety increases while self-image and confidence in health care are reduced and VF continues to decline. The authors hypothesize that this may be related to patients' being more aware of an increase in the number or depth of their scotoma. In early disease, other aspects of visual function such as contrast sensitivity may also become impaired, increasing patients' concerns regarding IOP, being treated differently, or the possibility of blindness.

In the late stages of glaucoma, both VFs and eventually VA become affected. The loss of VFs was associated with reduced self-image up to about -10 dB but remained unchanged beyond this level. The authors suggest that patients with advanced glaucoma and tunnel vision may not notice small VF changes. Moreover, those with advanced disease may have increased adaptation to vision loss and may have had more aggressive therapy (eg glaucoma surgery), thereby instilling in them more confidence in health care. Worsening VA, however, was linearly associated with a lower self-image and greater anxiety, suggesting that, in advanced disease, VA may be a better indicator of PF than VFs. Further research is required to determine the efficacy of different strategies for improving PF in glaucoma patients.

LONGITUDINAL CHANGES IN QUALITY OF LIFE AND RATES OF PROGRESSIVE VISUAL FIELD LOSS IN GLAUCOMA PATIENTS

Medeiros FA, Gracitelli CPB, Boer ER, et al⁶

ABSTRACT SUMMARY

Glaucomatous progression can lead to significant visual impairment that results in an increased incidence

of falls, a higher risk of motor vehicle collisions, and a reduced ability to perform other activities of daily living.⁷⁻¹¹ Medeiros et al performed an observational cohort study that evaluated the association between longitudinal changes in quality of life and rates of progressive VF loss in glaucoma. The study included 322 eyes of 161 patients with glaucomatous VF loss from the Diagnostic Innovations Glaucoma Study. The follow-up period was an average of 3.5 years. All subjects completed the National Eye Institute Visual Function Questionnaire (NEI VFQ)-25 at least twice and had at least five VF examinations during the course of the study. Rates of VF change were determined using the change in mean sensitivity of the integrated binocular VF. To determine the degree of impairment as measured by the NEI VFQ-25, a Rasch analysis was performed.

There were three critical findings from this study, which should be highlighted. The authors found a significant correlation between change in the NEI VFQ-25 Rasch scores during follow-up and change in binocular standard automated perimetry (SAP) sensitivity. For every 1-dB change in binocular SAP mean sensitivity per year, there was a change of 2.9 units per year in the Rasch scores. As expected, the amount of baseline VF loss was also important, as subjects with more advanced disease at baseline had more significant changes in NEI VFQ-25 scores. Finally, the rate of change in binocular SAP sensitivity was also found to influence patients' scores. The authors noted that shorter follow-up times had larger changes in NEI VFQ-25 scores for patients with the same amount of SAP sensitivity. The findings from this study indicate that clinicians need to assess VF changes carefully over time, as patients' VF and quality of life are affected by the aforementioned changes in binocular VF.

DISCUSSION

What is the NEI VFQ-25 Questionnaire?

The National Eye Institute helped create the NEI VFQ-25 with the purpose of developing a survey that would determine the impact of visual impairment/disability on activities related to daily living as well as emotional well-being and social functioning. The survey consists of a base set of 25 vision-targeted questions and an appendix of additional items from the larger 51-item version. The questions represent 11 subscales, which include general vision, near and distance vision activities, ocular pain, vision-related social function, vision-related role function, vision-related mental health, vision-related dependency, driving difficulties, color vision, and peripheral vision. The test takes approximately 10 minutes to administer, but a self-administered version is also available.^{12,13}

What is a Rasch analysis, and how is it helpful?

The Rasch model provides a way to analyze categorical data. An interval scale that determines "item difficulty" and "person measure" is created. Such analysis is especially useful in the case of a questionnaire. Typically, the responses are scored on a Likert scale, and when the scores are added, the relative value of each response category is treated as being the same, and the unit increases from the rating scale are given the same value. When evaluating numerous different aspects pertaining to quality of life, however, it is unlikely that the value of each response category will be the same. When a Rasch model is used, subjects' responses help dictate item difficulty. The final analysis from the model provides estimates of person measures. These measures can then be used to express where each respondent falls on a linear scale representing the degree of impairment as measured by the questionnaire.¹⁴⁻¹⁶ ■

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