Effect of Depression on Vision Function in Age-Related Macular Degeneration

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Objectives: To report the prevalence rate of depression in older patients with recent vision loss due to age-related macular degeneration (AMD) and to describe the effect of depression on self-reported vision function during 6 months.

Methods: Prospective cohort study of 51 older patients with recent-onset bilateral AMD attending the Retina Clinic of Wills Eye Hospital, Philadelphia, Pa. Main outcome measures included the Center for Epidemiological Studies Depression Scale, visual acuity, Functional Vision Screening Questionnaire, Chronic Disease Score, and Community Disability Scale.

Results: Seventeen patients (33%) were depressed at baseline and had worse visual acuity ($P = .04$) and greater levels of vision-specific ($P = .03$) and general ($P = .002$) physical disability than nondepressed patients. The correlations of Center for Epidemiological Studies Depression Scale score with visual acuity and visual-specific disability, however, were not significant after controlling for general physical disability. An increase in depressive symptoms over time predicted decline in self-reported vision function independent of changes in visual acuity or medical status ($P < .05$).

Conclusions: The prevalence and disabling effects of depression in older patients with AMD are substantial. Recognizing that depression is a treatable disorder that exacerbates the effects of AMD will lead to improved outcomes. Innovative interventions to prevent or treat depression in specialty eye clinics are possible.

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The prevalence and disabling effects of age-related macular degeneration (AMD) are increasing as the population ages.1 Williams,2 Mangione,3 and Scott4 et al demonstrated that AMD causes high levels of emotional distress and reduced quality of life. However, whereas the first 2 studies noted weak, nonsignificant relationships between visual acuity and quality-of-life measures, the latter found that worse visual acuity was associated with emotional distress.2,4 Brody et al5 found high rates of depression and significant correlations between depression and vision-specific and general disability but not with visual acuity.4,6 We have previously found that the relationship between visual acuity and depression is mediated by the loss of valued, discretionary activities.6 These studies show that, although AMD substantially disrupts the quality of patients’ lives, its disabling effects and not its severity per se predict depression.

The studies cited above have been cross sectional, however, and are confounded by the reciprocal relationships between depression and disability (ie, disability leads to depression, depression exacerbates disability). There have been no longitudinal studies investigating changes in visual acuity, disability, and depression to clarify these relationships, to our knowledge. In this prospective study, we report the prevalence rate of depression in older patients with recent-onset bilateral AMD and describe the longitudinal relationships between changes in visual acuity, vision function, and depression in these patients.

RESULTS

Seventeen patients (33%; 95% confidence interval [CI], 19.9-47.0) were depressed (CES-D score $>16$) at baseline (ie, 6 weeks after vision loss in the second eye). Table 1 compares their demographic and clinical characteristics with those of the 34 nondepressed patients. Depressed subjects had worse visual acuity and greater levels of both vision-specific and general physical disability than nondepressed patients but were otherwise comparable in severity of comorbid medical disorders and demographic characteristics.

Depression scores were significantly correlated with vision-specific disability ($r = 0.31$; 95% CI, 0.04-0.54), gen-

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PATIENTS AND METHODS

We screened consecutive patients at the Wills Eye Hospital Retina Service, Philadelphia, Pa, to identify those with preexisting AMD in one eye with visual acuity worse than 20/70, who had vision loss in the second eye due to exudative AMD within the preceding 6 weeks resulting in visual acuity worse than 20/70. We chose these criteria to identify subjects with sufficiently impaired vision to cause functional limitations and recent onset of bilateral vision loss. Additional inclusion criteria were age greater than 64 years and residence within 25 miles of Wills Eye Hospital. We excluded cognitively impaired subjects (eg, 3 or more errors on the Kahn-Goldfarb Mental Status Questionnaire).7

Potential subjects (N = 109) were screened from January 1, 1998, to July 31, 1998, until the planned enrollment of 51 subjects was completed. We banded this sample size on the previously reported strong correlation (r = 0.44; confidence interval, 0.19-0.64) of the Geriatric Depression Scale with general function in visually impaired subjects.8 With the proposed sample of 51, the study has 92.9% power (α = 0.05, 2-tailed) to detect a moderate correlation between depression and disability. Sixty-four subjects met the inclusion criteria and 51 (79.7%) agreed to the in-home clinical interview. There were no differences in demographic or vision characteristics between those who refused and subjects who were enrolled. We reinterviewed 46 subjects (90% of those enrolled) 6 months later. The Thomas Jefferson University institutional review board approved this investigation; all subjects provided informed consent signed consent. The Baltimore Center for Public Health Research and Evaluation, Baltimore, Md, conducted the in-home interviews. Two graduate-level professional surveyors assessed depressive symptoms and visual and physical disability. Ophthalmologic diagnoses and distance acuity were ascertained from subjects’ Wills Eye Hospital records.

We evaluated depression by means of the Center for Epidemiological Studies–Depression (CES-D) Scale.9 This instrument contains 20 items that assess the severity and frequency of depressive symptoms during the past week. The CES-D scores range from 0 to 60; higher scores indicate more severe depressive symptoms. A score of 16 or higher has high sensitivity and specificity rates for identifying subjects with depressive disorder.10 Patients with CES-D scores greater than 16 were categorized as depressed in this study. Baseline visual acuity (best-corrected distance visual acuity in the better eye) was measured at Wills Eye Hospital by means of the Snellen eye chart. Visual acuity at 6 months was obtained from Wills Eye Hospital and community ophthalmologists’ records. Distance acuity was transformed into the logarithm of the minimum angle of resolution (logMAR), which converts visual fractions to a metric value more easily fitted to statistical analyses.

We used the Chronic Disease Score (CDS) to provide an objective measure of medical morbidity derived from a weighted sum of medications taken for chronic disease.11 Clark et al12 validated the CDS on more than 250 000 managed care enrollees and found that it predicts health care utilization, costs, hospitalization, and mortality.12 The CDS is scored as projected yearly total health care costs in dollars.

We assessed vision-related disability by means of the Functional Vision Screening Questionnaire, which consists of 15 self-rated yes-no items that rate performance on vision-related tasks (eg, watching television, reading newspaper, recognizing faces, driving). Scores range from 0 to 15, with higher scores indicating greater disability. A score of 9 has sensitivity of 0.72 and specificity of 0.94 to detect patients with a corrected distance acuity of 20/70 or worse.13 The term vision function refers to self-rated Functional Vision Screening Questionnaire scores.

We used the Community Disability Scale to assess activities of daily living, instrumental activities of daily living, and mobility.14 This 28-item instrument was used in the East Baltimore Mental Health Epidemiologic Catchment Survey on 175 000 adults. Higher scores indicate greater disability.

Initial analyses consisted of comparing subjects who were and were not depressed at baseline by means of 1-way analyses of variance and χ2 for linear and categorical variables, respectively. A multiple regression analysis was used to delineate correlates of baseline CES-D score. Six-month change in vision function was evaluated with a separate multiple regression.
This investigation reports the prevalence and impact of depression in this particular population of older persons with bilateral AMD. Its strengths are its prospec-
Depressed patients had more general and vision-specific disability than nondepressed patients and slightly worse visual acuity, although the correlations between CES-D score and both vision-specific disability and visual acuity were not significant after controlling for general disability. These findings agree with those of others reporting weak or nonsignificant relationships between visual acuity and depression, and others reporting reciprocal relationships between disability and depression in older patients with chronic medical diseases. However, because many nonophthalmologic diseases (eg, cardiovascular disease and cancer) share symptoms with depression (eg, fatigue and anorexia), disentangling their effect on disability has been difficult. Age-related macular degeneration provides a unique disease model to examine these interrelationships because it shares no symptoms with depression. Our longitudinal data suggest that as depressive symptoms increase over time, there is a corresponding decline in vision function occurring independently of change in visual acuity. We found a similar effect when depression was analyzed as the categorical diagnosis of major depression. The current report extends that finding by demonstrating that vision function declines in patients whose depression symptoms increase, regardless of whether they meet criteria for major depression. The psychological and somatic symptoms of depression probably account for its adverse effect on vision function. Discouragement and helplessness drain inner resolve and resiliency, and anergia, poor appetite, and sleep impairs effortful behaviors.

Ophthalmologists are well aware of the emotional consequences of AMD and have been as frustrated in their efforts to respond to depression as they are to restore vision. Unfortunately, many obstacles prevent them from treating depression, such as resource and time constraints and lack of familiarity with treatment indications and psychotropic medications. As a result, depression remains an untreated source of excess disability in many patients. Our findings attest to these disabling effects of depression but also suggest that interventions may be helpful. Recognizing that depression is not simply an understandable consequence of vision loss but rather a distinct, treatable disorder is a necessary first step. Second, ophthalmologists can encourage patients and their families to seek psychiatric care for demoralization and hopelessness, especially if these symptoms persist over time. Third, innovative interventions to prevent or treat depression in specialty eye clinics are possible. We are currently evaluating the efficacy of a psychosocial intervention to prevent depression in older persons with AMD in a randomized, controlled clinical trial funded by the National Institute of Mental Health. Brody et al already demonstrated the efficacy of a brief, behavioral group intervention to improve mood, self-efficacy, and use of vision aids in a similar population. Interventions such as these, as well as others that include education about AMD, increased access to community services, low-vision rehabilitation, support groups, home modifications, and treatment of depression, may ultimately prevent depression and enhance functioning and quality of life. Until treatments to restore vision are available, these approaches provide optimal care to patients with AMD.

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REFERENCES