

DIFFERENCES IN VISUAL FUNCTIONING AMONG PATIENTS WITH AGE-RELATED MACULAR DEGENERATION AND CATARACTS

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INTRODUCTION

- Age-Related Macular Degeneration (AMD) is a leading cause of blindness and visual disability in Americans aged 50 and older ¹
- Age-related cataract is an opacification of the lens in the eye that affects millions of people worldwide but is now curable with highly effective and minimally invasive surgical intervention ²
- The VFQ-25 is a 25-item questionnaire developed by the National Eye Institute (NEI) to assess visual functioning based on daily activities.

PURPOSE

To: 1) Compare the results of VFQ-25 response data between patients affected by early-/intermediate-AMD and patients with cataracts, and 2) Stratify and analyze VFQ composite score for these two cohorts based on visual acuity

METHODS

Database

- 652 Individuals enrolled in an AMD registry from July 2014 to May 2022 at a single eye center.

Inclusion Criteria

- Patients diagnosed with early-intermediate AMD or age-related cataracts

Exclusion Criteria

- Patients diagnosed with advanced AMD
- Patients diagnosed with cataracts who completed the VFQ-25 following phacoemulsification surgery

Visual Acuity

- Snellen visual acuity (VA) was measured in patients at time of study enrollment

NEI VFQ-25

- Patients completed this questionnaire to quantify visual functioning. Subscale and composite scores range from 0 to 100, 100 being optimal functioning

Statistical Analysis

- Comparison between two groups performed with Fisher’s Exact Test (categorical) and Welch’s two-sample t-test (continuous)
- Univariate and multivariable linear regression used to quantify differences between the two groups

RESULTS

Table 1: Patient characteristics for AMD cases and controls

Variable	AMD Case, N = 415	Cataract Control, N = 237	p-value ¹
Age, Mean (SD)	76.0 (7.4)	73.1 (5.9)	<0.001
Sex, n (%)			0.802
Male	155 (37%)	91 (38%)	
Female	260 (63%)	146 (62%)	
Race/Ethnicity, n (%)			<0.001
White	394 (95%)	204 (86%)	
Hispanic	7 (1.7%)	11 (4.6%)	
African American	6 (1.4%)	14 (5.9%)	
Asian	3 (0.7%)	3 (1.3%)	
Other/Uncertain	5 (1.2%)	5 (2.1%)	
Type 1 Diabetes, n (%)	2 (0.5%)	0 (0%)	0.537
Type 2 Diabetes, n (%)	58 (14%)	28 (12%)	0.472
History of Cardiac Disease, n (%)	136 (33%)	64 (27%)	0.134
History of TIA/Stroke, n (%)	24 (5.8%)	3 (1.3%)	0.004
History of Kidney Disease, n (%)	38 (9.3%)	26 (11%)	0.497

Table 3: Composite visual function score stratified by visual acuity

Visual Acuity	n AMD/Cataract	AMD Case, Mean (SD)	Cataract Control, Mean (SD)	p-value ¹
Better-seeing eye				
20/20 or better	175/87	91.6 (7.8)	86.1 (11.8)	<0.001
20/25 - 20/30	182/110	88.3 (10.8)	81.4 (14.8)	<0.001
20/40	40/32	83.4 (12.1)	80.8 (17.5)	0.478
20/50 or worse	16/6	75.7 (17.8)	71.4 (20.1)	0.654
Worse-seeing eye				
20/20 or better	58/24	93.2 (6.2)	88.8 (7.5)	0.016
20/25 - 20/30	171/92	90.3 (9.9)	83.2 (14.3)	<0.001
20/40	92/69	88.5 (8.5)	82.2 (15.3)	0.002
20/50 or worse	93/51	83.4 (13.9)	80.4 (15.7)	0.251

¹Welch Two Sample t-test

Table 2: Composite and Sub-scale scores for cases and controls

Variable	AMD Case, N = 415	Cataract Control, N = 237	p-value ¹
Composite Score, Mean (SD)	88.8 (10.7)	82.8 (14.5)	<0.001
General Health, Mean (SD)	67.9 (23.1)	69.7 (22.4)	0.320
Visual subscale mean scores			
General Vision, Mean (SD)	75.6 (13.8)	66.5 (17.5)	<0.001
Ocular Pain, Mean (SD)	90.5 (14.8)	86.7 (19.0)	0.008
Near Activities, Mean (SD)	87.2 (17.8)	77.1 (21.7)	<0.001
Distance Activities, Mean (SD)	87.8 (16.0)	76.9 (20.9)	<0.001
Color Vision, Mean (SD)	98.0 (8.6)	96.0 (11.0)	0.016
Peripheral Vision, Mean (SD)	92.6 (16.1)	87.7 (20.5)	0.001
Socio-emotional subscale mean scores			
Social Functioning, Mean (SD)	96.9 (9.5)	94.2 (13.0)	0.005
Mental Health, Mean (SD)	84.0 (18.3)	80.6 (20.5)	0.034
Role Limitations, Mean (SD)	87.9 (20.3)	78.5 (25.3)	<0.001
Dependency, Mean (SD)	94.9 (13.7)	92.0 (17.3)	0.025
Driving, Mean (SD) ²	80.8 (21.8)	74.7 (23.0)	0.001

¹Welch Two Sample t-test ²56 missing values

Table 4: Effect of cataract control status on VFQ Composite Score

Variable	n	Parameter Estimate (95% CI) ¹	p-value
Univariate Analysis			
Cataract Control Status	652	-5.9 (-7.9 to -4.0)	<0.001
Stratified by better-seeing eye visual acuity			
20/20 or better	262	-5.4 (-7.8 to -3.0)	<0.001
20/25 - 20/30	292	-6.9 (-9.8 to -3.9)	<0.001
20/40	72	-2.6 (-9.6 to 4.4)	0.46
20/50 or worse	22	-4.3 (-23 to 14)	0.63
Multivariable Analysis ²			
Cataract Control Status	646	-4.8 (-6.7 to -2.9)	<0.001

¹CI = Confidence Interval

²Adjusted for better eye visual acuity, worse eye visual acuity, age, race/ethnicity, and stroke

KEY FINDINGS

- 1) Patients in the AMD cohort demonstrated significantly higher composite scores and all subscale scores apart from general health (Table 2)
- 2) The AMD cohort had higher VFQ-25 scores even when stratified by VA, but these differences were only significant when VA was at or better than 20/30 in the better-seeing eye or 20/40 in the worse-seeing eye (Table 3)
- 3) AMD cases continued to have significantly higher VFQ composite scores after adjustment for significant factors such as age (Table 4)

CONCLUSIONS

Patients with cataracts self-reported worse visual functioning than patients diagnosed with early-/intermediate-AMD, perhaps indicating the importance of preserved peripheral vision in AMD on visual functioning. This pattern remained after adjustment and when stratified by visual acuity.

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