Impacts of impaired face perception on social interactions and quality of life in age-related macular degeneration: A qualitative study and new community resources

Jo Lane[1], Emilie M. F. Rohan[2], Faran Sabeti[2,7], Rohan W. Essex[3], Ted Maddess[2], Amy Dawel[1], Rachel A. Robbins[4], Nick Barnes[5], Xuming He[6], Elinor McKone[1*]

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Full vision assessment information, including rationale for ranking patients' functional vision based on best-eye BCVA (Includes Tables A & B).

Twenty of the 21 patients underwent a full vision assessment in a clinical setting at the Australian National University (approximately 90 minutes per patient; same payment and ethics/consent arrangements as for the interview part of the study). Visual acuity was assessed monocularly using Best Corrected Visual Acuity (BCVA) and Low Contrast Visual Acuity (LCVA) using a retro-illuminated logMAR chart mounted on a stand conforming to the ETDRS standard format [1]. Other tests were used to diagnose AMD type, and stage using the Age-Related Eye Disease Study (AREDS system) [2], and to exclude other visual disorders. These included: examination of the anterior segment of the eye using slit-lamp biomicroscopy; instilling Oxybuprocaine Hydrochloride 0.4% eye drops to anesthetise the eyes to measure intraocular pressure using Goldmann applanation tonometry and to measure central corneal thickness using a Pachmate (DGH Technology Inc., Exton, PA); 10-2

frequency doubling technology (FDT) threshold using Humphrey Matrix (Carl Zeiss Meditec, Inc., Dublin, CA). After the visual field test both eyes were dilated with Tropicamide 1% and Phenylephrine 2.5% and the following tests were done: Optical Coherence Tomography (OCT) Spectralis (Heidelberg Engineering, Heidelberg, Germany) of the retina (posterior-pole) and the peripapillary retinal nerve fibre layer (pRNFL); scan was done to measure the thickness of the RNFL surrounding the optic nerve and fundus auto-fluorescence images were also acquired; Fundus photography was performed using a Canon CR-2 (Canon Inc. Medical Equipment Group, Tokyo, Japan) digital non-mydriatic camera to get an image of the fovea, the macula and the optic nerve.

Table A shows BVCA, LCVA, AMD type, and AREDS stage for each eye separately.

In terms of ranking (and then grouping) our patients by severity of vision loss, we used best-eye BCVA. Empirical justification for this — rather than, for example, using LCVA or acuity information from the poorer eye — was as follows.

First, consider low-contrast visual acuity (LCVA), still from the best eye. Whichever was the patients' best eye by BCVA was also their best eye by LCVA. Best-eye LCVA was extremely highly correlated with best-eye BCVA (r = .93), indicating no statistical potential of LCVA to explain any additional variance in functional vision. Consistent with this, Table B (top half) shows that best-eye LCVA correlations with everyday visual function (on the National Eye Institute Visual Function Questionnaire, NEIVFQ [3]) were no higher than best-eye BCVA correlations, for any of the full-scale NEIVFQ-25 nor the two individual items relevant to face perception (A6 and Q11); indeed, LCVA correlations were slightly lower. Further, a stepwise regression predicting NEIVFQ-25 entering BCVA first followed by LCVA showed no independent effect of LCVA (on entering LCVA, *F change* (1, 18) =.264 *p*=.614, with *R square change* indicating only 1.1 % of variance was explained by LCVA).

Second, consider the other eye. Recall that the other eye also has AMD, but with lower acuity. Worst-eye BCVA was largely uncorrelated with best-eye BCVA in our sample (r = .28), meaning there is statistical potential for worst-eye BCVA to explain additional variance in functional vision. However, analysis discounted this possibility. Table B (top half) shows bivariate correlations with everyday functional vision (the NEIVFQ measures) were all nonsignificant. More importantly, stepwise regression predicting NEIVFQ-25 entering BCVA first followed by LCVA showed no independent effect of LCVA (on entering LCVA, *F change* (1, 18) =.786 p=.387, with *R square change* indicating only 3.3 % of variance was explained by worse-eye acuity). Additionally, note that worst-eye acuity showed only weak correlations with psychological wellbeing measures (Table B bottom half).

Table A. Detailed vision information for both eyes (bold indicates strongest eye).

Patient code (from Table 1)	Eye	Visual Acuity [1]		Diagnosis	Visual Acuity Repeated test [2]		AREDS Stage [4]
		BCVA	LCVA		BCVA	LCVA	
P1	L	6/240	6/240	Wet AMD			4
	R	**6/7.5**	**6/15**	**Dry AMD**			4
P2	**L**	**6/9.5**	**6/19**	**Wet AMD**	**6/12**	**6/24**	**4**
	R	6/120	6/190	End-stage AMD	6/120	6/200	4
P3	L	6/15	6/60	Dry AMD			4
	R	**6/12**	**6/30**	**Dry AMD**			4
P4	L	CF	<6/240	End-stage AMD			4
	R	**6/12**	**6/19**	**Wet AMD**			4
P5	**L**	**6/15**	**6/38**	**Wet AMD**	**6/12**	**6/19**	4
	R	6/190	<6/240	Wet AMD	6/240	<6/240[5]	4
P6	L	6/95	6/120	End-stage AMD			4
	R	**6/15**	**6/30**	**Wet AMD**			4
P7	**L**	**6/15**	**6/60**	**Dry AMD**			4
	R	6/95	6/240	Dry AMD			4
P8	L	CF	<6/240	Wet AMD			4
	R	**6/15**	**6/60**	**Early AMD**			3
P9	L	6/24	6/38	Early AMD			3
	R	**6/19**	**6/30**	**Wet AMD**			4
P10	L	6/30	6/60	Dry AMD			4
	R	**6/19**	**6/48**	**Dry AMD**			4
P11	**L**	**6/19**	**6/48**	**Wet AMD**			4
	R	6/190	<6/240	End-stage AMD			4
P12	**L**	**6/24**	**6/38**	**Early AMD**			3
	R	6/95	6/120	End-stage AMD			4
P13	**L**	**6/24**	**6/60**	**Wet AMD**	**6/24**	**6/60**	4
	R	CF	<6/240	End-stage AMD	CF	<6/240	4
P14	L	6/190	<6/240	End-stage AMD			4
	R	**6/38**	**6/48**	**Wet AMD**			4
P15	**L**	**6/38**	**6/60**	**Wet AMD**			4
	R	CF	<6/240	End-stage AMD			4
P16	**L**	**6/60**	**6/95**	**Dry AMD**			4
	R	6/95	6/120	Dry AMD			4
P17 [3]	L	3/60	-	Wet AMD			**-**
	R	**<6/60****	**-**	**Wet AMD**			-
P18	L	6/150	6/240	Dry AMD			4
	R	**6/75**	**6/150**	**Dry AMD**			4
P19	**L**	**6/75**	**6/120**	**Wet AMD**	**6/24**	**6/48**	**4**
	R	6/240	<6/240	End-stage AMD	6/240	<6/240	4
P20	**L**	**6/75**	**6/190**	**Wet AMD**			4
	R	HM	<6/240	End-stage AMD			4
P21	**L**	**6/190**	**<6/240**	**End-stage AMD**			4
	R	6/240	<6/240	End-stage AMD			4

Notes:

[1] BCVA = best corrected visual acuity (high contrast), LCVA = low contrast visual acuity; CF = counting fingers, HM = hand movements. LCVA results with <6/240 indicates the patient could not read all letters on the largest line of the LCVA chart. L = left eye (i.e., OS, ocular sinister), R = right eye (i.e., OD, oculus dextrus).

[2] For the 4 patients with more than 6 months between interviews, vision testing was repeated close in time to Interview 2. Note diagnosis and AREDS stage was unchanged at the second vision assessment.

[3] P17 did not have a vision assessment at ANU. Visual acuity (BCVA only) was reported by ophthalmologist.

[4] AREDS = Age-related Eye Disease Study [2]. AREDS stages are based on anatomy of the central 6mm of the retina. Stage 1 = Early AMD, small drusen. Stage 2 = Early AMD, intermediate drusen. Stage 3 = Early AMD, large drusen. Stage 4 = Active exudative AMD, CNV (choroidal neovascularisation)/Wet AMD; or End-stage Dry AMD/sub-foveal GA (geographic atrophy). For AREDS Stages 1 to 3 it is expected visual acuity would be close to normal; for Stage 4 acuity can vary from normal to <6/60 (e.g., depending on treatment).

Table B. Correlations (*r*) between different possible acuity measures and everyday visual function and psychological wellbeing.

		Acuity measure used as predictor		
	Dependent measures	**Best-eye BCVA**	**Best-eye LCVA**	**Worst-eye BCVA**
Everyday visual function				
	NEIVFQ-25	-.47*	-.36	-.39
	NEIVFQ-25 A6	-.58**	-.55**	-.33
	NEIVFQ-25 Q11	-.48*	-.45	-.44
Psychological wellbeing				
	Anxiety (GAI)	.44*	.49*	.10
	Depression (GDS)	.12	.23	-.08
	MacDQoL	-.41	-.39	-.23

Notes:
* $p < 0.05$ (2 tailed) ** $p < .001$(2-tailed). Correlations performed with acuity scores in LogMAR. See main text Table 2 for dependent measure details. Patient P17 did not have a vision assessment; her ophthalmologist reported her BCVA was <6/60, however 6/60 or logMAR +1.0 was entered into the correlation. P17 did not have a LCVA score; a score of 6/120 or logMAR +1.3 was entered into the correlation (which is her expected LCVA score based on her BCVA score). NEIVFQ [3], GAI [4], GDS [5], MacDQoL [6].

References for S4 File

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