The Vision Related Quality of Life and Anxiety-Depression Levels of Age-Related Macular Degeneration During COVID-19 Pandemic

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Abstract

Purpose: To evaluate anxiety, depression status, and vision related quality of life (QoL) in patient with age-related macular degeneration (AMD) during the early phase of COVID-19 pandemic.

Methods: Seventy-one voluntary patients with AMD and demografic variables matched 36 healthy controls were compared in this study. All the subjects were evaluated with the Hospital Anxiety and Depression Scale (HAD-A and HAD-D) and National Eye Institute Visual Functioning Questionnaire-25 (NEI-VFQ-25).

Results: There were no statistically significant difference in HADS-A and HADS-D between the AMD group and controls ($p<0.05$) When the patients with AMD were assigned to two distinct groups according to binocular visual acuity, proportion of patients above the HADS cut-off points for anxiety did not differ between the groups ($p=0.208$) and 55.6 % of patients above the HADS cut-off points of depression in low vision AMD group were significantly differ from other groups (p=0,022). The statistically significant lower means of NEI-VFQ-25 parameters except general health and ocular pain were observed in AMD patients compared with controls ($p<0.05$).

Conclusions: The AMD patients had lower vision related QoL scores during COVID-19 pandemic and it is recommended psychiatric counseling opportunities is needed for AMD patients having low binocular visual acuity.

Introduction

The shock during the coronavirus disease 2019(COVID-19) pandemic caused the “lockdown” which has emerged by the governments to delay the spread of the virus. The health system has evolved the priorities in medical care. The first reaction of medical authorities has been to restrain the access of non-urgent patients to hospitals.

The increased risk of death is associated with older age, cardiovascular disease, diabetes, chronic respiratory disease, hypertension[1] The estimated case fatality ratio was higher in those aged 60 years and over (4.5%) compared with those aged under 60 years of age (1.4%).[2] Unfortunately, the pandemic has driven fear and got the stress levels higher accompanying to the spread of the effects of COVID-19 by social media platforms. Independent of the government and the medical authorities, some of the patients with chronic diseases requiring revisits and follow-ups have developed the feeling of being infected at hospitals accompanying with the avoidance of their physician consultations and continuation of their treatments. We do not much know the amount of the effects of this anxiety on the adherence to their treatments as well as the when the COVID-19 and the COVID-19 Phobia will be beaten.

The Hospital Anxiety and Depression Scale (HADS) consisting of 14 questions, seven for anxiety and seven for depression was developed to measure anxiety and depression levels.[3] HADS includes two subscales: HADS-A assessing anxiety, and HADS-D assessing depression was designed to measure the

risk of anxiety and depression and validity and reliability of HADS in the Turkish population were assessed by Aydemir et al.[4] Using HADS, the survey with a total of 24.789 responders during the pandemic was shown that the overall prevalence of anxiety, depression, were 51.6%, 47.5%, respectively[5]. Using HADS, Ozdin et al. reported that HADS anxiety and depression scores in Turkish society during the pandemic were 6.8 ± 4.2 and 6.7 ± 4.2, respectively. In terms of HADS cut-off points, 45.1% (n = 155) scored above the cut-off point for anxiety and 23.6% (n = 81) of the population scored above the depression cut-off point. [6]

The stress and anxiety during the pandemic are the inevitable reactions in crisis situations that may lead negative impact on patients with chronic conditions requiring revisits. We do not know much about the stress and anxiety levels in patients with chronic conditions during COVID-19 Pandemic. Using Beck Anxiety Inventory II, frequency of severe anxiety was significantly higher in Parkinson 's disease group (25.5%) than control group (4.8) but no significant correlation was observed between Parkinson's severity and anxiety. [7] The study evaluating anxiety and depression in patients with morphea taking immunosuppressive drugs during the COVID-19 pandemic, HADS-A and HADS-D scores did not differ in morfea group compared with age and sex-matched healthy subjects.[8]

To the best of our knowledge, our study is the first to evaluate the levels of anxiety and depression levels of patients with age-related macular degeneration (AMD) during the early phase of COVID-19 pandemic. In this study, we aimed to evaluate the impact of COVID-19 pandemic on the quality of life, using the HADS-A, HADS-D, NEI- VFQ-25 in AMD patients.

Methods

This prospective study, in accordance with the tenets of the Declaration of Helsinki and with the approval of the local ethics committee was performed on the patients who were diagnosed as having AMD and healthy control subjects free of systemic diseases except hypertension agreeing to participate. The Survey was administered using the online survey portal, Google forms® (Online survey services) between 01 and 05 June 2020 during the lockdown. The online link *(*https://forms.gle/pcFBm51nsHG2dZXj8*)* through WhatsApp was send to AMD patients and controls which were seen for refractive errors before the pandemic.

Patients with comorbid disorders except hypertension and ocular diseases such as glaucoma, vitreomacular traction, epiretinal membrane, macular hole, diabetic retinopathy, retinal detachment, previous retinal surgery, glaucoma, amblyopia, strabismus, severe media opacities were excluded. In accordance with our inclusion criteria, previously examined age-and sex-matched patients with refractive errors with a range of + 1.00-(-1.00) D were served as controls. The records of patients who met the our inclusion criteria were reviewed for demographic data and ophthalmologic measurements including best-corrected visual acuity, refractive error, slit-lamp evaluation, extraocular movements, intraocular pressure with pneumatic tonometer, and evaluation of macula using OCT.

Patients agreeing to participate were asked to complete the two online questionnaires: the HADS test, the NEI-VFQ-25 test using Google Forms.

HADS has been developed to measure anxiety and depression in the settings of an hospital out patient clinic and the community. It is an easily applicable and reliable self-rating scale that consists of two subscales, one measuring anxiety and an other measuring depression. Although the anxiety and depression items are interspersed with in the scale, these are scored separately. Each subscale has seven items answered by the patient on a four-point Likertscale. [3]Total score ranges between 0 and 21 for each of the two subscales. Turkish validity and reliability of the scale was established by Aydemir et al. The cut-offscore of the Turkish version for anxiety subscale is 10 and 7 for depression subscale.[4]

To asses vision related quality life, we used The National Eye Institute Visual Function Questionnaire (NEI-VFQ-25) of which the validity and reliability in the Turkish population were assessed by Toprak et al[9]. It depends of 25 questions evaluating general health, general vision, ocular pain, near activities, distance activities, vision-specific social functioning, vision-specific mental health, vision-specific role difficulties, vision-specific dependency, driving, color vision, and peripheral vision.

The AMD group was divided into two subgroups[10]: dry type and wet type. The dry type group consisted of patients with early- and intermediate-stage AMD ranged from medium-sized drusen or mild RPE abnormalities to large-sized drusen. The wet type group consisted of patients with choroidal neovascularization, serous and/or hemorrhagic detachment of retina or RPE, hard exudates, fibrovascular proliferation, or disciform scar. For distinct analysis AMD group also divided into two subgroups: patients having binocular visual acuity worse than 0.3 and patients having binocular visual acuity equal to or better than 0.3.

SPSS software version 20.0 (SPSS Inc, Chicago, IL) was used for statistical analyses. The descriptive statistics presented include means and standard deviations (SD) for all variables. For comparing differences between groups, The Chi-square test, the Kruskal-Wallis test, and the Mann-Whitney U test with Bonferroni correction were used. Spearman’s correlation analysis was used to examine the relationships between the groups.

Results

The demographic and ocular characteristics of 71 patients with AMD (36 of whom were man) with a mean age of 67,27 ± 7,83 years (range, 50–84 years) and 36 participant as control group (18 of whom were man) who served as a control group with a mean age of 64,55 ± 8,31 years(range, 50–86 years) are shown in Table 1.

Table 1
Demographic characteristics of the age- related macular degeneration and control groups

	AMD	Control	P value
Age, years	67.27 ± 7.83	64.55 ± 8.31	0.082
Gender (male/female)	36/35	18/18	0.676
Snellen visual acuity			
Worse-seeing eye	0.32 ± 0.31	0.94 ± 0.18	0.000
Binocular	0.61 ± 0.30	0.99 ± 0.04	0.000
Duration of AMD (months)	41.44 ± 32.04		
Laterality of AMD (unilateral/bilateral, n)	15/55		
Forms of AMD (wet/dry)	43/28		
AMD, age- related macular degeneration.			
P value, Mann-Whitney U test			

Table 2 provides the percentage of subjects above the anxiety and depression cut-off, means of HADS and NEI-VFQ-25 test parameters. In terms of HADS cut-off points, 21.1 % (*n* = 15) of the patients scored above the anxiety cut-off point, and 35.2 % (*n* = 25) scored above the cut-off point for depression. There were no statistically significant difference in HADS-A and HADS-D between the AMD patients and controls whereas, statistically significant lower means of NEI-VFQ-25 parameters except general health and ocular pain were observed in AMD patients compared with controls ($p < 0.05$; Table 2).

Table 2
Differences in the Hospital Anxiety and Depression Scale (HADS) and the National Eye Institute Visual Functioning Questionnaire-25 (NEI-VFQ-25) between the AMD and control groups

	AMD	Control	P value
Percentage of subjects above the Anxiety cut-off, % (n)	21.1 (15)	8.3 (3)	0.095
Percentage of subjects above the Depression cut-off, % (n)	35.2 (25)	19.4 (7)	0.092
HADS-A	6.30 ± 5.09	5.53 ± 3.41	0.771
HADS-D	6.59 ± 4.75	4.67 ± 3.21	0.073
General health	38.03 ± 18.35	43.75 ± 17.29	0.207
General vision	58.59 ± 17.34	76.67 ± 14.73	0.000
Ocular pain	70.42 ± 26.58	76.39 ± 19.08	0.343
Near activities	51.76 ± 27.31	76.85 ± 20.33	0.000
Distance activities	57.98 ± 27.26	90.74 ± 14.47	0.000
Social functioning	69.01 ± 27.78	97.22 ± 11.22	0.000
Mental health	59.07 ± 31.26	83.51 ± 16.38	0.000
Role difficulties	42.86 ± 32.98	76.25 ± 31.70	0.000
Dependency	68.97 ± 32.78	93.68 ± 16.26	0.000
Driving	47.65 ± 26.54	91.02 ± 7.95	0.000
Color vision	75.70 ± 28.34	93.75 ± 19.25	0.000
Peripheral vision	58.80 ± 30.21	92.36 ± 17.75	0.000

AMD, age- related macular degeneration.

HAD, Hospital Anxiety and Depression Scale

P value, Mann-Whitney U test

	AMD	Control	P value
Composite score	60.07 ± 21.52	86.22 ± 10.41	0.000
AMD, age- related macular degeneration.			
HAD, Hospital Anxiety and Depression Scale			
P value, Mann-Whitney U test			

The composite score of NEI- VFQ-25 were significantly negative correlated with HADS-A (-0.589, p = 0.000) and HADS-D (-0.676, p = 0.000) in AMD group, whereas the only HADS-D (-0.423, p = 0.010) was correlated with the composite score of NEI- VFQ-25 in Control group (Table 3).

Table 3
Correlation of the Composite score of National Eye Institute Visual Function Questionnaire with the Hospital Anxiety Depression Scales and visual acuity

	Composite score of NEI- VFQ-25			
	AMD		Control	
	r	p	r	p
HADS-A	-0.589	0.000	-0.205	0.230
HADS-D	-0.676	0.000	-0.423	0.010
Visual acuity of Worse-seeing eye	0.594	0.000	0.144	0.401
Binocular visual acuity	0.452	0000	-0.178	0.300
NEI- VFQ-25, National Eye Institute Visual Function Questionnaire				
HADS, Hospital Anxiety and Depression Scale				
r, Spearman's correlation coefficient				

When the AMD patients were classified into two distinct groups according to the binocular visual acuity, number of patients above the HADS cut-off points for anxiety and depression in group having binocular visual acuity worse than 0.3 were 3 (16.7 %) and 10 (55,6 %), respectively. There were statistically significant differences in all parameters except HADS-A, general health, and ocular pain between the two subgroups of AMD patients and control subjects (Table 4).

Table 4
Differences in the Hospital Anxiety and Depression Scale (HADS) and the National Eye Institute Visual Functioning Questionnaire-25 (NEI-VFQ-25) between the two groups of AMD and control group

	AMD		Control	P value
	Binocular Visual Acuity < 0,3	Binocular Visual Acuity > 0,3		
Percentage of subjects above the Anxiety cut-off, % (n)	16.7 (3)	22.6 (12)	8.3 (3)	0.208
Percentage of subjects above the Depression cut-off, % (n)	55,6 (10)$^{\mu}$	28.3 (15)	19.4 (7) $^{\mu}$	0,022
HADS-A	7,17 ± 4,83	6,00 ± 5,19	5,53 ± 3,41	0.493
HADS-D	8,72 ± 4,65*$^{¥}$	5,87 ± 4,60$^{¥}$	4,67 ± 3,21*	0,012
General health	31,94 ± 14,36	40,09 ± 19,20	43,75 ± 17,29	0,073
General vision	47,78 ± 17,00*$^{¥}$	62,26 ± 16,01$^{¥§}$	76,67 ± 14,74*§	0,000
Ocular pain	59,72 ± 24,46	74,06 ± 26,50	76,39 ± 19,08	0,061
Near activities	29,63 ± 15,97*$^{¥}$	59,28 ± 26,34$^{¥§}$	76,85 ± 20,33*§	0,000
Distance activities	30,56 ± 20,41*$^{¥}$	67,30 ± 22,70$^{¥§}$	90,74 ± 14,47*§	0,000
Social functioning	47,92 ± 29,47*$^{¥}$	76,18 ± 23,42$^{¥§}$	97,22 ± 11,22*§	0,000

AMD, age- related macular degeneration.

P value, Mann-Whitney U test

$^{\mu}$p = 0.007(The Chi-square test)

*p < 0.017 (Mann–Whitney U-test with Bonferroni correction between AMD group having binocular visual aquity less than 0.3 and controls)

$^{¥}$ p < 0.017 (Mann–Whitney U-test with Bonferroni correction between AMD group having binocular visual aquity less than 0.3 and AMD group having binocular visual aquity better than 0.3)

§ p < 0.017 (Mann–Whitney U-test with Bonferroni correction between AMD group having binocular visual aquity better than 0.3 and controls)

	AMD		Control	P value
Mental health	41,67 ± 27,87*¥	64,98 ± 30,36¥§	83,51 ± 16,38*§	0,000
Role difficulties	16,87 ± 20,22*¥	51,68 ± 31,90¥§	76,25 ± 31,70*§	0,000
Dependency	47,35 ± 32,04*¥	76,31 ± 29,90¥§	93,68 ± 16,26*§	0,000
Driving	39,57 ± 24,30*¥	50,40 ± 26,92¥§	91,03 ± 7,95*§	0,000
Color vision	56,94 ± 29,46*¥	82,08 ± 25,18¥§	93,75 ± 19,25*§	0,000
Peripheral vision	37,50 ± 24,63*¥	66,04 ± 28,63¥§	92,36 ± 17,75*§	0,000
Composite score	41,41 ± 14,58*¥	66,41 ± 19,81¥§	86,22 ± 10,41*§	0,000
AMD, age- related macular degeneration.				
P value, Mann-Whitney U test				
μp = 0.007(The Chi-square test)				
*p < 0.017 (Mann–Whitney U-test with Bonferroni correction between AMD group having binocular visual aquity less than 0.3 and controls)				
¥ p < 0.017 (Mann–Whitney U-test with Bonferroni correction between AMD group having binocular visual aquity less than 0.3 and AMD group having binocular visual aquity better than 0.3)				
§ p < 0.017 (Mann–Whitney U-test with Bonferroni correction between AMD group having binocular visual aquity better than 0.3 and controls)				

Discussions

The sudden decline in visual acuity is associated with progression of non neovascular AMD to neovascular AMD or deferral of the anti-VEGF therapy [11] Vander et al estimated daily growth rate of n-AMD in any one direction ranged from 0 to 37 μm (mean, 9 μm daily).[12] Muether et al. [13] showed that a delay in treatment of more than 28 days compared with 28 days or less resulted in a statistically significant greater percent of patients with at least 1 line loss of vision (p = 0.01) and suggested not to delay anti-VEGF injection more than 2 weeks following medical indication.

Quality of life (QoL) is often measured via questionnaires. The mostly used vision specific QoL scale in AMD is NEI-VFQ-25 providing an evaluation of the impact of visual impairment on the emotional wellbeing, social relationships and daily activities of patients with chronic blindness. [14] In accordance with the present study, studies using NEI-VFQ, AMD groups had lower scores in most of the items of the NEI-VFQ-25 test compared with controls.[15–20] The previous studies have shown that there is a significant association between chronic eye diseases and depression. The depression rates among AMD patients ranged between 11%-%44[14]. Using the Goldberg Anxiety and Depression (GAD) scale; 44.4% of people with AMD had clinically significant depressive symptoms compared to 17.5% of controls ($p < 0.001$)[20]. Using HADS, the percentage of patients with exudative AMD scoring higher than the cutoffs in HADS-A and HADS-D were significantly higher than the controls (41.5% versus 12.5% and 63.5% versus 27.5%) [18] Mathew et al.[20] reported that AMD led to depressive symptoms both directly and indirectly via reduced general health and social functioning.

A pandemic are not only biological or medical phenomena but also is psycho-social problem. Relatively high rates of symptoms of anxiety (6.33–50.9%), depression (14.6–48.3%), post-traumatic stress disorder (7–53.8%), psychological distress (34.43–38%), and stress (8.1–81.9%) are reported in the general population during the COVID-19 pandemic.[21] Best of our knowledge, present study is the first one evaluating the anxiety, depression status, and QoL of the patients with AMD during the early COVID-19 lockdown. Our results showed that the AMD patients having low binocular visual acuity were more likely to experience depression symptoms with lower QoL than age-matched control subjects having normal vision. Whereas, higher proportions of anxiety and depression and higher means of HADS-A and D scores were seen in patients with AMD, none of them reached statistically significance. The lack of significant differences between AMD and control groups may be due to the fact that the currents study was conducted during the nationwide lockdown. As the most of the individuals restricted to leave home except unless absolutely necessary, all individuals are exposed to coronophobia. Supporting this point of view, Ozdin et al.[6] did not found statistically significant difference between the age groups of 18–49 and ≥ 50 years and surprised as the 80 % of mortality is in older subjects. The authors reasoned the protective role of crystallized intelligence with increasing experience against life events may play role in such result.

We found relatively lower rates of anxiety and depression compared with Turkish cohort with a mean age of 37.16 ± 10.31 years.[6] This differences may attributed to our participants with the higher mean of age (67.27 ± 7.83 for AMD group, 64.55 ± 8.31 for control group) compared with that of Ozdin et al. [6] it may be speculated that higher mean of age in our study helped to cope with anxiety and depression.

The small sample size and lack of data about COVID-19 related stressors are our study limitations. Moreover, as the cross-sectional nature of the study, it is difficult to generalize to COVID-19's long-term effect. We could not enroll the patients unable to use smart phones and this might lead possibility of selection bias. Future studies evaluating anxiety and depression status having scheduled revisits and

Anti VEGF injections with that of AMD patients having no chance of revisits and Anti VEGF injections during COVID-19 Pandemic.

Future longitudinal studies on this topic are warranted to provide a more comprehensive understanding of this issue.

In conclusion, our results showing tendency of higher HADS-A and HADS-D scores in AMD group compared with controls and the presence of significantly higher rates of patients having higher depression scores in subgroup of AMD having poor visual acuity are needed to be proven by future studies. In case of the extension of COVID-19 pandemic, deferral of revisits and Anti VEGF injections in AMD patients may pronounce our results of regarding mental health. Thus, telemedicine and online psychiatric counseling may improve the quality of life in AMD patients.

Declarations

Declaration of interest

The authors report no conflicts of interest. The authors alone responsible for the content and writing of the paper.

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