Evaluation of Cataract Surgery Outcomes in Geriatric Population with Geriatric Depression Scale

Gonca Ayşe Ünal[1], Ayşegül Barak Özer[2], Emin Serbülent Güçlü[3], Ömer Özer[4], Zeki Baysal[4]

1 Psychiatry Clinic, Mersin State Hospital, Mersin, Türkiye
2 Psychiatry Clinic, Niğde Training and Research Hospital, Niğde, Türkiye
3 Ophthalmology Clinic, Mersin State Hospital, Mersin, Türkiye
4 Department of Ophthalmology, Niğde Ömer Halisdemir University, Niğde, Türkiye

Abstract

Aim: To show the changes in geriatric depression scale (GDS) scores in patients undergoing senile cataract surgery.

Methods: A total of 74 patients aged 60 years and older who presented to the Mersin City E&R hospital Ophthalmology Clinic between January 01, 2023, and May 01, 2023, with low vision and underwent phacoemulsification surgery for senile cataract were included in this study. Patients with antidepressant use and/or ongoing follow-up and treatment for depression in a psychiatric clinic were excluded from this study. All patients were evaluated with the GDS before the surgery and the third month after surgery.

Results: When the distribution according to GDS is analyzed, 38 patients scored 0-10 points, 18 patients scored 11-13 points, 18 patients scored 14 points and above in the preoperative period. In the postoperative period, 49 patients scored 0-10 points, 14 patients scored 11-13 points, 11 patients scored 14 points and above. The mean preoperative GDS score was 10.22 ± 5.01, while the mean postoperative GDS score was 8.2 ± 4.92. There was a positive correlation (r=0.680 preoperative and r=0.801 postoperative) between visual acuity and GDS score in the preoperative period (p<0.001 for both).

Conclusions: Cataract surgery may potentially reduce the risk of depression or shorten the duration of depression in geriatric patients

Keywords: *Cataract, Depression, Elderly, Geriatric, Surgery*

1. Introduction

Senile cataract is an age-related ophthalmologic disease in which the lens becomes cloudy and causes visual loss[1]. It is one of the most common causes of visual impairment worldwide[1,2]. In 2020, cataract caused approximately 15.2 million cases of blindness and 78.8 million cases of visual impairment in the population over 50 years of age[3]. Depending on the severity of the disease, patients complain of blurred vision, distance and/or near low vision. Such ocular symptoms can cause great discomfort and stress. A study in 2022 reported that adults with self-reported general visual impairment had higher Kessler psychological distress scores[4]. Furthermore, cataract-related visual impairment can lead to limitations in mobility and activities of daily living, which can negatively affect mental health in older adults[5]. Therefore, the relationship between senile cataract and mental health is an important topic worthy of further research.

Major depressive disorder (MDD) is one of the most common mental disorders. To date, many studies have identified risk factors for MDD. Depression is more common in populations with chronic illnesses. The elderly in particular are more likely to suffer from chronic medical conditions, making them more prone to depression. Ocular diseases in the elderly have not yet been identified as a risk factor for MDD[6,7].

Many studies have reported on the relationship between cataract and depression. In 2020, a nationwide population-based longitudinal study in Taiwan revealed a significant association between cataract and increased risk of developing depression[8]. In a 2021 Span-

* Corresponding Author: Ömer Özer
e-mail: omerozer92@gmail.com
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ish cross-sectional analysis focusing on cataract patients with diabetes, only women were significantly associated with higher rates of depression[9].

The relationship between cataract and depression needs to be further investigated, as previous studies have not yielded conclusive results. The aim of this study was to show the changes in geriatric depression scale scores in patients undergoing senile cataract surgery.

2. Materials and methods

A total of 74 patients aged 60 years and older who presented to the Mersin City Hospital Ophthalmology Clinic between January 01, 2023 and May 01, 2023 with low vision and underwent phacoemulsification surgery for senile cataract were included in this study. Patients with antidepressant use and/or ongoing follow-up and treatment for depression in a psychiatric clinic were excluded from this study. Written informed consent was obtained from all participants. The necessary permissions were obtained from Toros University Scientific Research and Publication Ethics Committee (2023/122-27/10/2023). The study was conducted in accordance with the Declaration of Helsinki.

Geriatric depression score is a scale that can be used for the diagnosis of depression in the geriatric population and its Turkish validity and reliability study was conducted by Ertan and Eren. In this scoring, 0 to 10 points are classified as “no depression”, 11 to 13 points as “probable depression” and 14 points or more as “definite depression” [10].

Patients were divided into three groups according to preoperative visual acuity level. Patients in group 1 had best corrected visual acuity (BCVA) logMAR 0.3 to 0.6, patients in group 2 had BCVA logMAR 0.7 to 1.0 and patients in group 3 had BCVA logMAR 1.1 to 2.0. Cataract surgery was not performed in patients with BCVA logMAR 0.3 and above. Age and gender of all patients were recorded. A geriatric depression scale was administered to all patients by a specialized psychiatrist before cataract surgery. The GDS was administered again by the same psychiatrist at the third month visit after uncomplicated cataract surgery and the results were compared.

Statistical analysis of the study data was performed with SPSS 24.0.1 package program (IBM Corp, Armonk, NY, USA). Categorical variables were expressed as number (n) and percentage (%) and continuous variables were expressed as mean ± standard deviation. The normal distribution of continuous variables was checked by Shapiro-Wilk test. Student's t test, paired t test and one-way ANOVA test were used to compare the means of the groups. The association between categorical variables was investigated by Chi-Square analysis. Statistical significance level was taken as $p<0.05$ for all comparisons.

Table 1

Age and gender distribution of the patients

	Overall		Group 1		Group 2		Group 3		p
N (%)	74 (100)		19 (25.7)		21 (28.4)		34 (45.9)		
Age (years)	72.16 ± 6.78		71.74 ± 7.35		73.19 ± 7.35		71.76 ± 6.21		0.719
Male (n, %)	38	51.4	9	47.4	11	52.4	18	52.9	0.921
Female (n, %)	36	48.6	10	52.6	10	47.6	16	47.1	

3. Results

The mean age of the patients was 72.16 ± 6.78 years. Of all patients, 38 (51.4%) were male. There were 19 patients in group 1 (preoperative BCVA logMAR between 0.3 and 0.6), 21 patients in group 2 (preoperative BCVA logMAR between 0.7 and 1.0) and 34 patients in group 3 (preoperative BCVA logMAR between 1.1 and 2.0). There was no difference in age and gender distribution between the groups (p=0.719 and p=0.921, respectively) (Table 1).

The mean preoperative BCVA was logMAR 1.06 ± 0.45 and the mean postoperative BCVA was logMAR 0.26 ± 0.14. The mean GDS in the preoperative period was 10.22 ± 5.01 and the mean GDS in the postoperative period was 8.2 ± 4.92. In all groups, the mean BCVA and GDS in the preoperative and postoperative periods were statistically significantly different (p<0.001, both) (Table 2).

When the distribution according to GDS is analysed, 38 patients scored 0-10 points, 18 patients scored 11-13 points, 18 patients scored 14 points and above in the preoperative period. In the postoperative period, 49 patients scored 0-10 points, 14 patients scored 11-13 points, 11 patients scored 14 points and above. There was no difference between preoperative and postoperative GDS scores in all patients (p=0.167). In Group 2, 8 patients scored 0-10 points, 6 patients scored 11-13 points, 7 patients scored 14 points or more in the preoperative period. In the postoperative period, 16 patients scored 0-10 points, 4 patients scored 11-13 points, and 1 patient scored 14 points or more. In group 2, a statistically significant difference was observed between preoperative and postoperative GDS scores (p=0.023). (Table 3)

There was a positive correlation between BCVA in the preoperative period and GDS score (r=0.680 for preoperative and r=0.801 for postoperative) (p<0.001, both). There was a positive correlation (r=0.443) between BCVA in the postoperative period and postoperative GDS scores (p<0.001) (Table 4).

Table 2

Visual acuity and geriatric depression scale results before and after surgery

	Overall	Group 1	Group 2	Group 3
N (%)	74 (100)	19 (25.7)	21 (28.4)	34 (45.9)
VA pre-op	1.06 ± 0.45	0.5 ± 0.11	0.9 ± 0.11	1.47 ± 0.26
VA post-op	0.26 ± 0.14	0.12 ± 0.07	0.26 ± 0.10	0.35 ± 0.12
p	<0.001			
GDS pre-op	10.22 ± 5.01	6.05 ± 3.27	11.14 ± 4.99	11.97 ± 4.58
GDS post-op	8.2 ± 4.92	4.58 ± 3.01	6.62 ± 4.15	11.21 ± 4.43
p	<0.001			

VA: Visual acuity, GDS: Geriatric depression scale

4. Discussion

The relationship between cataract and depression is an increasingly important research topic. These conditions, which affect older people in society and are quite common, can also be seen together. At the same time, senile cataracts cause negative effects on people's comfort due to the loss of vision it causes.

In study, a community-based sample of 662 people aged over 70 years was selected.

Table 3

Distribution of patients according to GDS scores before and after surgery

	Overall		Group 1		Group 2		Group 3		p1	p2
N (%)	74 (100)		19 (25.7)		21 (28.4)		34 (45.9)			
GDS	Preop	Postop	Preop	Postop	Preop	Postop	Preop	Postop		
0 - 10 points	38	49	18	19	8	16	12	14		
11 - 13 points	18	14	1	0	6	4	11	10	<0.001	<0.001
14 - 30 points	18	11	0	0	7	1	11	10		
p3	0.167		0.311		0.023		0.883			

GDS: Geriatric depression scale, p1: Intergroup comparison before surgery, p2: Intergroup comparison after surgery, p3: Intragroup comparison before and after surgery

Table 4

Correlation analysis of the study parameters

		VA pre-op	VA post-op	GDS pre-op	GDS post-op
Age (years)	r	-0.089	0.074	-0.088	-0.110
	p	0.453	0.534	0.455	0.351
VA pre-op	r		0.656	0.680	0.801
	p		<0.001	<0.001	<0.001
VA post-op	r			0.393	0.443
	p			<0.001	<0.001
GDS pre-op	r				0.919
	p				<0.001

VA: Visual acuity, GDS: Geriatric depression scale

The number of patients with clinically significant depressive symptoms was calculated to be 6.7% in cataract patients[11]. In a meta-analysis of different disease categories, the prevalence of depression was highest for dry eye disease at 29%, followed by glaucoma, age-related macular degeneration and cataract patients at 23%[12]. An Australian study included 329 participants with cataract. The prevalence of depressive symptoms among patients was 28.6%[13]. A total of 813 adults awaiting cataract surgery participated in a multicenter prospective cohort study, of which 456 (56.1%) were male. The prevalence of high depression score was reported as 87.4%[14].

A Chinese study evaluated depression among cataract patients. It was found that high anxiety scores and low visual acuity in the better seeing eye were risk factors for depression in cataract patients. In the same study, both anxiety and depression scores decreased after surgery[15].

A meta-analysis on this subject included 16 studies. Depression in cataract patients decreased significantly after surgery (p<0.001). In addition, in 6 controlled studies, the decrease in depression was higher in the surgical patient group than in the control group (p=0.019)[16].

A population-based study investigated the effect of cataract on depression risk and the benefits of cataract surgery. A total of 233,258 patients were included. At a mean follow-up of 7.8 years, cataract was significantly associated with an increased risk of developing depression (hazard ratio [HR]=1.78, p<0.001). In particular, a lower risk of depression was reported in patients who underwent surgery for cataract compared to those who did not (HR=0.75, p<0.001)[8].

In a study conducted by Meuleners et al., mental health outpatient clinic visits for depression and/or anxiety were evaluated in patients who underwent cataract surgery. It was shown that one year after cataract surgery, there was a significant decrease of 18.8% (p ≤ 0.001) in the number of mental health visits for depression and/or anxiety. The corresponding reduction in healthcare expenditure for the treatment of depression and/or anxiety was 28%[17].

In a study conducted in Montreal, 672 patients were examined. While 41% of patients had an BCVA of 6/18 or worse, 26% had symptoms of depression before surgery. In the logistic regression model, those with BCVA ≤6/18 had a 59% higher probability of depression[18].

In one study in the literature, 100 patients were evaluated. It was shown that the most depressed patients were those suffering from age-related macular degeneration and proliferative diabetic retinopathy, as well as glaucoma and cataracts[19].

In an observational prospective study of a cohort of 150 patients undergoing cataract surgery and assessed for changes in depressive symptomatology, the difference in pre- and postoperative depression scores correlated with the difference in pre- and postoperative BCVA (p<0.001). Paired sample t-test revealed a statistically significant difference between pre- and postoperative depression scores (p<0.001). Paired sample Wilcoxon signed-rank test revealed a statistically significant improvement in depression status (p=0.004)[20].

A community-based study evaluated 4611 Chinese adults aged 60 years and older. Adults with cataract were found to be more likely to have depressive symptoms than those without[21].

In a study involving 413 participants scheduled for cataract surgery, there was a significant decrease (improvement) of one point in the depressive symptoms score after cataract surgery (p=0.04)[22].

In another study, participants were evaluated with the Geriatric Depression Scale (GDS) one day before and three months after cataract surgery. The mean postoperative visual acuity improvement was 0.77±0.18 and the mean GDS score difference was -1.49±1.72. Postoperative improvement in visual acuity and GDS scores were statistically significant (p=0.001)[23].

In our study, the prevalence of depression among cataract patients was found to be 24.3% (18/74). This rate decreased to 14.9% after cataract surgery (11/74). At the same time, both preoperative and postoperative VA levels and GDS scores had a statistically significant correlation. In our study, the patients who benefited most from cataract surgery in terms of depression were those with a preoperative visual acuity between logMAR 0.7 and 1.0 (group 2). Patients with a preoperative visual acuity of 1.1 or above were considered to have other comorbidities (glaucoma and/or age-related macular degeneration) that were probably the cause of visual loss. Therefore, cataract surgery may not have fully reflected the expected positive effect. Large-scale studies are needed to evaluate the effect clearly.

In conclusion, screening for depression in senile cataract patients is important and cataract surgery has been reported to have a beneficial effect in reducing the risk of depression. It should be taken into consideration that older adults who have limitations in daily tasks due to visual impairment may be more functional after cataract surgery. Cataract surgery in these patients may potentially reduce the risk of depression or shorten the duration of depression.

Statement of ethics

The study was approved by the Toros University Scientific Research and Publication Ethics Committee (2023/122-27/10/2023).

Conflict of interest statement

The authors declare that they have no financial conflict of interest with regard to the content of this report.

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