

## VISUAL FUNCTION AND QUALITY OF LIFE IN PSEUDOPHAKIC PATIENTS

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Loss of visual function due to cataract can be a major obstacle to doing everyday activities and can decrease quality of life.

The aim of the paper was to determine the impact of cataract surgery on the visual function and quality of life in pseudophakic patients. Two hundred twenty-two patients were examined, 242 cataract surgeries were performed, and surgery was done on both eyes in 40 patients. Postoperative questionnaires scores VF-14 ( $87.85 \pm 17.10$  med95.80), CATQ ( $13.72 \pm 6.30$  med12.00) and EQ-5D ( $5.78 \pm 1.47$  med5.00) were significantly better after surgery.

Pseudophakic patients have statistically better preoperative and postoperative VF-14 scores ( $76.23 \pm 18.09$  med79.75;  $90.89 \pm 15.66$  med97.90) regarding the patients with second eye cataract. CATQ scores in pseudophakic patients are poorer preoperatively ( $21.19 \pm 7.25$  med21.00) and postoperatively ( $12.63 \pm 6.17$  med10.00) regarding the patients in the cataract group.

Pseudophakic patients have poorer EQ-5D preoperative and postoperative scores ( $7.54 \pm 1.64$  med7.00;  $5.66 \pm 1.35$  med5.00) regarding the patients with second eye cataract.

Pseudophakic patients have significantly better visual function and quality of life before and after surgery, with regards to patients with second eye cataract.

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**Key words:** senile cataract, visual function, quality of life

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### Introduction

Senile cataract is the leading and most easily eliminated cause of visual impairment in the world. According to the World Health Organization (WHO), up to 45 million people are blind (about 0.7% of the world's population) and 180 million have low vision. Cataract is the leading cause of blindness (47.8%) and approximately 20 million people are blind due to cataract. Low vision becomes a significant problem in developed countries because the population is getting older, and also because of the chronic diseases,

and in developing countries it is mostly caused by infectious agents (1-3).

The existence of cataract is an obstacle in obtaining information from the environment and in doing everyday activities; also, it is obvious that the quality of vision is essential for maintaining the quality of life. Monocular visual acuity was the only indication for surgery and a parameter for assessing postoperative outcomes.

Patients with the same monocular visual acuity often have neither the same visual needs nor the same visual function. Therefore, using special visual function assessment questionnaires in patients with cataract is recommended. There is a strong and highly significant correlation between subjective ophthalmological symptoms and the level of quality of life (HR-QoL) (4, 5).

HR-QoL instruments include the processing of subjective data that measure patient's ability to perform daily activities, to take part in social activities, the level of emotional status and some other dimensions of everyday life (6). Full understanding the functionality of patients with cataract involves, beside the measurement of visual acuity, the use of special instruments for assessing and measuring quality of life, on which depends the need for sur-

gery. A patient with cataract has lower visual acuity, contrast sensitivity, and altered color vision. All this could have an impact on daily life and subjective perception of independence.

In the last twenty years, a lot of useful questionnaires with items that patients respond by gradation of subjective perception of difficulties in performing specific everyday activities were developed (7). The most widely used questionnaires for assessing quality of life and surgical outcomes are Visual Functioning Index (VFI i VF-14), CatQuest, Visual Activities Questionnaire (VAQ), Cataract Score Scale (CSS). Measuring visual function and quality of life become an integral part of patient care and it is an imperative to develop a valid, accurate and brief questionnaire.

### Aims

The purpose of this study was to determine an impact of senile cataract surgery on the visual function and quality of life in pseudophakic patients.

### Material and methods

This is a prospective study in which 202 patients were examined, 242 cataract surgeries were performed, and surgery was done on both eyes in 40 patients at the eye department at HC Kosovska Mitrovica and the Clinic for Eye Diseases in Nis.

The patients were divided into two groups;

common to both groups is that they consist of patients who had cataract in one eye. However, these groups differed regarding the status of cataract in the other eye, as that information could affect the outcome – the first group (cataract) had cataract in the other eye, and the second group consisted of patients who had cataract surgery on the other eye and they were pseudophakic (pseudophakia).

Monitoring parameter is a visual function via the results of applied standardized instruments (VF-14 and Catquest -9SF). Eventually, each patient was asked about the subjective feeling of quality of life (questionnaire EQ-5D).

Patients were screened again, one month after surgery. The results are shown in tables, as a statistically significant result was interpreted as  $p < 0.05$ .

### Results

Visual function and quality of life, before and after cataract surgery, are displayed using the results of measurement instruments (VF-14, CATQ and EQ-5D).

Visual function and quality of life, analyzed with these questionnaires in all patients, regardless of the group, are significantly better after cataract surgery. After cataract surgery, the level of difficulties related to visual function is significantly lower, and the quality of life is significantly better (Table 1).

**Table 1.** Preoperative and postoperative results of the VF14, CATQ and EQ5D questionnaires in all patients

	Arithmetic mean	SD	Median	Minimum	Maximum	Results
VF14 1	71.89	20.50	72.90	16.70	100.00	Z = -12.509 p < 0.001
VF14 2	87.85	17.10	95.80	25.00	100.00	
catq 1	.26	8.01		7.00	37.0023	23.00
catq 2	13.72	6.30	12.00	6.00	36.00	
EQ5D 1	7.78	1.67	8.00	5.00	12.00	Z = -12.109 p < 0.001
EQ5D 2	5.78	1.47	5.00	5.00	12.00	

Average postoperative results are statistically significantly better compared to preoperative results. The average postoperative outcome of the VF-14 ( $87.85 \pm 17.10$  med95.80) is significantly better the preoperative one ( $71.89 \pm 20.50$  med72.90). Also, the postoperative CATQ outcome ( $13.72 \pm 6.30$  med12.00) is statistically significantly better than preoperative ( $23.26 \pm 8.01$  med23.00). Postopera-

tive EQ-5D outcome ( $5.78 \pm 1.47$  med5.00) is significantly better than the preoperative one ( $7.78 \pm 1.67$  med8.00).

Descriptive statistics and the results of the statistical analysis of VF-14 questionnaire before and after surgery, divided by groups, are shown in Table 2.

**Table 2.** Preoperative and postoperative results of the VF-14 questionnaire with regard to the group

		Group					Results
		Arithmetic mean	SD	Median	Minimum	Maximum	
VF14 1	cataract	68.73	21.61	66.70	16.70	100.00	Z = -2.577 p = 0.010
	pseudophakia	76.23	18.09	79.75	25.00	100.00	
VF14 2	cataract	85.64	17.81	92.70	25.00	100.00	Z = -3.263 p = 0.001
	pseudophakia	90.89	15.66	97.90	41.60	100.00	

Patients with pseudophakia in the other eye have significantly better results of VF-14 questionnaire, preoperatively and postoperatively, compared to patients with cataract in the other eye.

The average preoperative result of VF-14 questionnaire in pseudophakia group ( $76.23 \pm 18.09$ , med 79.75) and postoperative ( $90.89 \pm$

$15.66$  med97.90) are significantly better than the average preoperative ( $68.73 \pm 21.61$  med66.70) and postoperative ( $85.64 \pm 17.81$  med92.70) results in the cataract group.

The same analysis was done for CATQ outcomes and the results are displayed in Table 3.

**Table 3.** Preoperative and postoperative results of the CATQ questionnaire with regards to the group

		Group					Results
		Arithmetic mean	SD	Median	Minimum	Maximum	
catq 1	cataract	24.76	8.22	26.00	7.00	37.00	Z = -3.503 p < 0.001
	pseudophakia	21.19	7.25	21.00	9.00	36.00	
catq 2	cataract	14.52	6.29	13.00	6.00	36.00	Z = -3.226 p = 0.001
	pseudophakia	12.63	6.17	10.00	6.00	36.00	

Patients with pseudophakia in the other eye have poorer CATQ scores, preoperatively and postoperatively, compared to the cataract group. This means they have less difficulties related to visual function.

The average preoperative CATQ scores ( $21.19 \pm 7.25$  med21.00) and postoperative ones

( $12.63 \pm 6.17$  med10.00,) in patients with pseudophakia are lower compared to preoperative ( $24.76 \pm 8.22$  med26.00) and postoperative CATQ scores ( $14.52 \pm 6.29$  med13.00) in patients with cataract.

EQ-5D scores in groups, before and after surgery, are descriptively presented in Table 4.

**Table 4.** Preoperative and postoperative results of the EQ-5D questionnaire with regards to the groups

		Group					Results
		Arithmetic mean	SD	Median	Minimum	Maximum	
EQ5D 1	cataract	7.95	1.68	8.00	5.00	12.00	Z = -3.503 p < 0.001
	pseudophakia	7.54	1.64	7.00	5.00	12.00	
EQ5D 2	cataract	5.87	1.54	5.00	5.00	12.00	Z = -3.226 p = 0.001
	pseudophakia	5.66	1.35	5.00	5.00	11.00	

Patients with pseudophakia in the other eye have poorer EQ-5D scores, preoperatively and postoperatively, compared to the group with cataract. This means they have less difficulties related to quality of life, compared to the cataract group.

The average preoperative EQ-5D scores in

pseudophakia group ( $7.54 \pm 1.64$  med7.00) and postoperative ( $5.66 \pm 1.35$  med5.00) are lower compared to the preoperative EQ-5D scores ( $7.95 \pm 1.68$  med8.00) and postoperative ones ( $5.87 \pm 1.54$  med5.00) in the cataract group.

To determine the influence of the group on the quality of life, it was necessary to create new variables that represent the difference between the results of visual function and quality of life. Delta is

the difference for each of the parameters. Further analysis is testing the significance of differences between groups after the change of parameters. Descriptive statistics is presented in Table 5.

**Table 5.** Difference between analyzed parameters

	Group	N	Mean	SD	Median	Minimum	Maximum	Results
ΔVF14	cataract	140	16.91	16.69	14.60	-22.90	70.80	Z = -0.399 p = 0.690
	pseudophakia	102	14.66	11.54	12.50	-10.40	54.10	
	Total	242	15.96	14.75	12.50	-22.90	70.80	
ΔCATQ	cataract	140	-10.24	6.94	-10.00	-27.00	7.00	Z = -1.947 p = 0.052
	pseudophakia	102	-8.56	5.73	-8.00	-23.00	1.00	
	Total	242	-9.53	6.50	-9.00	-27.00	7.00	
ΔEQ5D	cataract	140	-2.08	1.76	-2.00	-6.00	4.00	Z = -1.075 p = 0.283
	pseudophakia	102	-1.88	1.41	-2.00	-6.00	.00	
	Total	242	-2.00	1.62	-2.00	-6.00	4.00	

Based on the results it was found there is a greater change in before-after at all three parameters in the cataract group, but the difference is statistically significant only in the CATQ questionnaire.

## Discussion

After cataract surgery, all patients, regardless of the group, had significantly improved visual function and quality of life. There was statistically significantly lower level of difficulties related to visual function and statistically significantly better quality of life. After surgery, all patients regardless of the group, have significantly less difficulties in doing everyday activities, better quality of life and improved visual function.

According to the literature, 90.9% of patients have improvement in visual function and quality of life after cataract surgery on one eye, and this percentage was higher after cataract surgery on the other eye (8).

Patients with pseudophakia in the other eye had significantly better VF-14 scores, preoperatively and postoperatively, compared to patients with cataract in the other eye. This suggests that patients with pseudophakia had significantly less difficulties in doing everyday activities, before and after surgery, compared to patients in the cataract group.

Patients with pseudophakia in the other eye had significantly less difficulties in doing daily activities (reading newspapers and books, performing fine manual work, cooking, watching TV) than patients with cataract in the other eye. The high level of visual function in pseudophakic eye was achieved in the other eye as well as after cataract surgery.

Cataract in the other eye was the reason why patients in the cataract group had more difficulties related to the visual function, before and after surgery, compared to the patients with pseudophakia.

In the results published by other authors, patients had a significant improvement of visual function after cataract surgery, and the average preoperative VF-14 score was 82.6 and postoperative 94.8. Improvement of quality of life was significantly linked to the satisfaction with surgical outcome (9).

Patients with pseudophakia in the other eye have poorer CATQ score, preoperatively and postoperatively, compared to the cataract group. This suggests that they have less difficulties related to visual function and less difficulties in doing daily activities (reading newspapers, prices, movement on unfamiliar terrain) before and after surgery, compared to patients in the cataract group. The high level of visual function was achieved after cataract surgery in the other eye, and high level of visual function was already achieved in the operated, pseudophakic eye.

Cataract in the other eye was the reason why the patients in the cataract group had more difficulties related to the visual function, before and after surgery, compared to the patients with pseudophakia.

In the published study, 846 patients underwent cataract surgery on both eyes and the average preoperative CATQ score was  $-0.22 \pm 1.96$ , and postoperative  $-3.69 \pm 2.28$ . After cataract surgery on both eyes, 91.5% of patients had significantly less difficulties related to visual function, and 7.2% achieved poor Catquest score (10).

Also, the results of other studies suggest that patients who underwent cataract surgery on both

eyes, with or without comorbidities, have less difficulties related to visual function. Improvement of visual function after cataract surgery on one eye was similar as improvement of visual function in the other, treated eye, with or without comorbidities.

Postoperative CATQ score of the first treated eye, with or without comorbidities, are 1.92 and 3.57, respectively, and of the other one 1.44 and 2.94, respectively (11). Of the total number of patients with comorbidities in the treated eye, 25.6% of patients had significantly less difficulties related to visual function after surgery, 12.2% slightly lower, 37.8% lower, 15.6 % were without improvement.

Patients with pseudophakia in the other eye have poorer EQ-5D score, before and after surgery, compared to the cataract group. Regarding the mobility, self care, daily activities, pain and discomfort, anxiety and depression there were less difficulties compared to patients with cataract in the other eye, preoperatively and postoperatively. That means they have less difficulties related to the quality of life, preoperatively and postoperatively, compared to the cataract group. Pseudophakic patients had better quality of life, before and after surgery, compared to the patients with cataract in the other eye.

Pseudophakic patients preoperatively had less difficulties related to visual function and quality of life compared to patients with cataract in the other eye. After cataract surgery, pseudophakic patients had less benefits compared to patients in the cataract group. It is evident that the level of benefits is higher in cataract group in all three questionnaires

but only significantly higher in the CATQ questionnaire.

## Conclusion

Visual function and quality of life, analyzed with these questionnaires and in all patients, regardless of the group, are significantly better after cataract surgery. After cataract surgery, all patients, regardless of the group, have significantly less difficulties in performing daily activities and significantly better quality of life.

Patients with pseudophakia in the other eye have significantly better VF-14 score, preoperatively and postoperatively, compared to patients with cataract in the other eye.

Patients with pseudophakia in the other eye have poorer CATQ score, preoperatively and postoperatively, compared to the cataract group. This suggests they have less difficulties related to visual function, before and after surgery, compared to the cataract group.

Patients with pseudophakia in the other eye have poorer EQ-5D score, preoperatively and postoperatively, compared to the cataract group. This suggests they have less difficulties related to quality of life, before and after surgery, compared to the patients with cataract in the other eye.

There was a greater change in the value of the three observed parameters before-after in the cataract group but the difference was only statistically significant in the CATQ questionnaire.

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## Originalni rad

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doi:10.5633/amm.2018.0103**VIDNA FUNKCIONALNOST I KVALITET ŽIVOTA  
BOLESNIKA SA PSEUDOFAKIJOM***Dubravka Vukša<sup>1</sup>, Divna Stamenković<sup>1</sup>, Olja Đokić<sup>1</sup>, Maja Živković<sup>2</sup>,  
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Smanjenje ili gubitak vidne funkcije zbog katarakte je prepreka u obavljanju svakodnevnih aktivnosti i dovodi do pada kvaliteta života bolesnika. Cilj rada bio je utvrditi uticaj hirurgije katarakte na vidnu funkcionalnost i kvalitet života bolesnika sa pseudofakijom. Anketirano je 202 bolesnika kod kojih su urađene 242 hirurške intervencije, odnosno 40 bolesnika je operisalo oba oka. Postoperativni rezultati svih analiziranih upitnika kod svih bolesnika i to: VF-14 ( $87,85 \pm 17,10$  medijana 95,80), CATQ ( $13,72 \pm 6,30$  medijana 12,00) i EQ-5D ( $5,78 \pm 1,47$  medijana 5,00) statistički su značajno bolji od preoperativnih. Bolesnici sa pseudofakijom imaju statistički značajno bolje i preoperativne ( $76,23 \pm 18,09$  medijana 79,75) i postoperativne ( $90,89 \pm 15,66$  medijana 97,90) rezultate, VF-14 upitnika u odnosu na bolesnike koji su na drugom oku imali kataraktu. Vrednosti CATQ upitnika bolesnika sa pseudofakijom su niže i pre ( $21,19 \pm 7,25$  medijana 21,00) i posle ( $12,63 \pm 6,17$  medijana 10,00) operacije katarakte u odnosu na bolesnike u grupi sa kataraktom. Bolesnici sa pseudofakijom imaju niže i preoperativne ( $7,54 \pm 1,64$  medijana 7,00) i postoperativne ( $5,66 \pm 1,35$  medijana 5,00) vrednosti EQ-5D upitnika u odnosu na bolesnike koji su na drugom oku imali kataraktu. Bolesnici sa pseudofakijom imaju značajno bolju vidnu funkcionalnost i kvalitet života i pre i posle operacije u odnosu na bolesnike koji su na drugom oku imali kataraktu.

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