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Impact of Cataract Surgery in Restoration of Vision among Patients with Poor Pre-Operative Vision; A Tertiary Care Experience from Developing Country

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Abstract

***Background:** Cataract is defined as the opacity of lens which impedes the clear vision. Cataract surgery is performed to dislodge the opaque lens from the eye followed by the implantation of clear artificial intra-ocular lens to improve the vision of the patients.*

***Objective:** To study the impact of cataract surgery on the restoration of visual acuity and vision related quality of life in patients with very poor pre-operative vision.*

***Materials and Methods:** A case series study was conducted on 85 subjects, selected by non-probability purposive sampling. Study was done at Mayo hospital Lahore and study duration was 6 months i.e. from Jan, 2016 to June, 2016. Data was collected on visual function questionnaire after obtaining informed consent. Data analysis was done by using SPSS version 16.0. Both pre-operative (before operation) and post-operative data (after 2 weeks of operation) was collected from every subject. Data on visual outcome was classified using WHO classification.*

***Results:** Out of 85 subjects, 41.2% were males and 58.8% were females. Pre-operatively 100% patients had visual acuity <6/60. 2 weeks after operation 60% had visual acuity 6/6-6/18, 29.4% had <6/18-6/60 and 10.6% had <6/60. 61.2% subjects had improvement in reading, 47.1% reduction in falls, 62.4% reduction in depression and 54.1% increase participation in gatherings.*

***Conclusion:** Our study showed that cataract surgery had positive impact on visual acuity and vision related quality of life.*

Keywords: *impact, cataract surgery, visual restoration.*

Introduction

Cataract is defined as the opacity of lens which impedes the clear vision.(1) Cataract surgery is performed to dislodge the opaque lens from the eye which is followed by the implantation of clear artificial intra-ocular lens. (2) Visual restoration includes treatment and education for restoring maximum functional capacity for the individual as well as increasing state of independence, sense of prosperity and life quality.(2)

The results from study conducted in India in 2010 showed that 99% of patients operated with phacoemulsification and 98.2% manual small incision cataract surgery had corrected distance visual acuity (CDVA) of 20/60 and patient satisfaction scores

after surgery concerning the daily life activities were significantly better.(3) Descriptive study in Nigeria in 2007 concluded that 8 weeks after surgery 78.8% patients had good visual acuity while 17.4 had borderline acuity.(4) A randomized clinical trial by Golgate et al concluded that 81.08% patients with phacoemulsification and 71.1% with small incision surgery had post-op visual acuity of about 6/18.(5) Recently in Vietnam a cohort study from 2011-12 has reported that vision related quality of life was improved significantly after cataract surgery with p value of <0.001.(6) However the outcomes of study conducted by Godinich et al, exhibited that about 14% of patients who had unimproved visual function were older and less pacified with their life quality.(7) An interventional case series on 102 patients held in Japan stated that change in BCVA after cataract surgery was significantly associated with changes in mental status (p=0.035) which was correlated with depressive status (p<0.001).(8) A study by Huang.W et al on Chinese population which was published in 2011 reported that cataract surgery at Eye specialty hospital had greater visual results as compared to surgeries at tertiary care hospitals; a p-value of 0.041.(9) Comparative study of 100 patients in Lahore showed that 98% patients who underwent phacoemulsification had best corrected visual acuity of >6/18 after 3rd follow-up and 84% patients after extracapsular cataract extraction ECCE had best corrected visual acuity >6/18.(10)l¯ky Sweden longitudinal study demonstrated that VF-14 score after cataract surgery was 100 for all patients and after 5 years it reduced to 96.7, p value = 0.001. (11) Survey 2002-03 in Pakistan showed that unaided good visual function was obtained in 19.2% of patients with intra-capsular extraction and 49.7% with ECCE + intra-ocular lens.(12) Results of study carried out in Aga Khan Hospital Karachi 2009-11 suggested that the after phacoemulsification and ECCE surgery, the visual acuity of 93.3% patients was 6/6-6/18. (13) According to a study conducted in Peshawar in 2002,85% patients attained BCVA of 6/6-6/12 with lesser incidence of co-morbid complications.(14) In China, a study drew conclusion that according a 0 to 100 scale, mean visual function and quality of life scores for the cataract treated patients were 61.9 ± 30.0, and 71.0 ± 31.8 respectively.(15)

The purpose of our study is to determine the impact of cataract surgery on vision as well as the vision related physical activities and psychological behavior of patients and to compare the results of visual outcome with WHO visual standards.

Materials and Methods

A case series study was conducted to find out the impact of cataract surgery on the visual restoration among patients with very poor pre-operative vision. The duration of research was 6 months. The sample size comprised of 100 patients both male and female, 15 patients were lost during the follow up with 85 remaining. The subjects with age less than 25 and who had co-existing disease which would interfere with the results i.e acute macular degeneration, glaucoma were excluded from the study. Written consent was taken from all the subjects on consent form. Both pre-operative and post-operative data was collected on pre-tested questionnaire from every subject before and 2 weeks after the operation respectively. Visual acuity was measured by Snellen chart. Data entry and analysis were done with the help of SPSS version 16.0. The operational definitions are:

Results

Out of 85 subjects, 35(41.2%) were males and 50(58.8%) were females, 48.2% literate and 51.8% illiterate. 58.8% (n=50) of subjects were aged between 51-70 years, 31.8% (n=27) were between 31-50 years and 9.4% (n=8) were falling in 71-90 years of age.

Table.1 shows the comparison of pre-operative and post-operative visual acuity. 66(77.6%) patients had pre-op visual acuity of <6/60-HM and 19(22.4%) patients had perception of light only. 2 weeks after operation 51(60%) had good visual outcome i.e. visual acuity 6/6-6/18, 25(29.4%) had borderline visual outcome and 9(10.6%) patients had poor outcome with post-op visual acuity less than 6/60(<6/60-HM-PL)

Table 1. *Comparison of Pre-op and Post-op Visual acuity.*

		Pre-operative		Post-operative	
Variables	Response	Frequency	Percentage	Frequency	Percentage
Visual acuity	6/6-6/18	66	77.6	51	60
	<6/18-6/60	19	22.4	25	29.4
	<6/60-HM PL			8	9.4
				1	1.2

Table. 2 shows the effect of cataract surgery of vision related physical aspects. 29(34.1%) showed reduction in pain, 41 (48.2%) showed decreased discomfort and 66 (77.6%) had reduced blurring. There was improvement in reading 52(61.2%), in seeing bus steps 50(58.8%), recognizing faces 42(49.4%), locking door 53(62.3%), seeing vehicles 53(62.4%), doing work upto standard 71(82.9%), searching things 61(71.7%), going to washroom 42(49.4%), watching TV 49(57.6%), reading boards 47(55.3%), fixing objects 47(55.3%), going to gatherings 46(54.1%), judging liquid level 55(64.7%) and judging distance 54(63.6%).There was reduction in falls 40(47.1%) and glare 59(69.4%).

Table 2. *Impact on vision related physical aspects.*

		Pre-operative		Post-operative	
Variables	Response	Frequency	Percentage	Frequency	Percentage
Pain in eyes	Yes	31	36.5	2	2.4
	No	54	63.5	83	97.6
Discomfort	Yes	45	52.9	4	4.7
	No	40	47.1	81	95.3
Blurred vision	Yes	84	98.8	18	21.2
	No	1	1.2	67	78.8
	Not applied				
Difficulty in going out at night	Yes	67	78.8	9	10.6
	No	18	21.2	76	89.4
Difficulty in reading	Yes	60	70.6	8	9.8
	No	9	7.1	58	98.2
	Not applied	16	22.4	19	22.4
Difficulty in seeing bus steps	Yes	56	65.9	6	7.1
	No	28	32.9	78	91.8
	Not applied	1	1.2	1	1.2
Difficulty in recognizing from distance	Yes	80	94.1	11	12.9
	No	5	5.9	74	87.1
Difficulty in recognizing face	Yes	47	55.3	5	5.9
	No	38	44.7	80	94.1
Difficulty in locking door	Yes	59	69.4	6	7.1
	No	26	30.6	79	62.9
Difficulty in seeing vehicles	Yes	60	70.6	7	8.2
	No	25	29.4	78	91.8
Difficulty in doing work up to standard	Yes	83	97.6	12	14.1
	No	2	2.4	73	85.9
Difficulty in searching things	Yes	71	83.5	10	11.8
	No	12	14.1	73	85.9
	Not applied	2	2.4	2	2.4
Difficulty in differentiating coins	Yes	54	63.5	5	5.9
	No	31	36.5	80	94.1
Difficulty in going to washroom	Yes	47	55.3	5	5.9
	No	38	44.7	80	94.1
Difficulty in watching TV	Yes	58	68.2	9	10.6
	No	14	16.5	63	74.1
	Not applied	13	15.3	13	15.3

Difficulty in reading boards	Yes	57	67.1	10	11.8
	No	6	7.1	53	62.4
	Not applied	22	25.9	22	25.9
Difficulty in cooking	Yes	27	31.8	6	7.1
	No	7	8.2	28	32.9
	Not applied	51	60	51	60
Difficulty in sewing	Yes	26	30.6	4	4.7
	No	1	1.2	23	27.1
	Not applied	58	68.2	58	68.2
Difficulty in fixing objects	Yes	56	65.9	9	10.6
	No	7	8.2	54	63.5
	Not applied	22	25.9	22	25.9
Difficulty in driving during day	Yes	9	10.6	12	14.1
	No	3	3.5	73	85.9
	Not applied	73	85.9		
Difficulty in driving during night	Yes	11	12.9	1	1.2
	No	1	1.2	11	12.9
	Not applied	73	85.9	73	85.9
Falls	Yes	43	50.6	3	3.5
	No	42	49.4	82	96.5
Difficulty in going to gatherings	Yes	56	65.9	10	11.8
	No	26	30.6	72	84.7
	Not applied	3	3.5	3	3.5
Glare	Yes	71	83.5	12	14.1
	No	14	16.5	73	85.9
Difficulty in judging liquid level	Yes	60	70.6	5	5.9
	No	25	29.4	80	94.1
Difficulty in judging distance	Yes	61	71.8	7	8.2
	No	24	28.2	78	91.8

Table 3 shows the impact of cataract surgery on psychological aspects. This part of questionnaire tested the vision related psychological problems. 59(69.5%) out of 70(82.4%) patients had decreased reluctance to go out and more interest in their work, 44(51.8%) out of 52(61.2%) showed improvement in enjoying social function, 28(33%) out of 35(41.2%) had decreased sense of burden on others, 53(62.4%) out of 64(75.3%) had reduction in depression and 25(29.4%) out of 31(36.5%) had improvement in sleep.

Table 3. *Impact on psychological aspects related to vision*

		Pre-operative		Post-operative	
Variables	Response	Frequency	Percentage	Frequency	Percentage
Reluctant to go out	Yes	70	82.4	11	12.9
	No	15	17.6	74	87.1
Enjoy function less	Yes	52	61.2	8	9.4
	No	30	35.3	74	87.1
	Not applied	3	3.5	3	3.5
Burden on others	Yes	35	41.2	7	8.2
	No	50	58.8	78	91.8

Depression	Yes	64	75.3	11	12.9
	No	21	24.7	74	87.1
Less interest in work	Yes	70	82.4	11	12.9
	No	11	12.9	70	82.4
	Not applied	4	4.7	4	4.7
Difficulty in sleep	Yes	31	36.5	6	7.1
	No	54	63.5	79	92.9
Feel that they can't support family	Yes	21	24.7	2	2.4
	No	42	49.4	61	71.8
	Not applied	22	25.9	22	25.9

Discussion

Different studies have been done in the past to study the effect of cataract surgery on the restoration of vision because cataract constitutes 5% of blindness in Western Europe and approximately 50% in developing third world countries.(1) However it is a prospective study about effect of cataract surgery on the restoration of vision in patients of Mayo hospital, Lahore. The majority of patients was females and had age from 51 to 70 years. About half of the people were literate and half were illiterate. We assessed the changes in visual acuity and visual field and relation of all these changes with daily life activities of patients. According to WHO recommended levels, >80% of subjects should have unaided visual acuity and >90% have best corrected visual acuity of 6/6-6/18.(10)¯ky In our study the better visual outcome is seen in about 60% of patients, with about 10% of subjects having poor outcome. These results are different from Ibadan study which suggested that postoperatively 90 % percent of patients had better visual acuity compared with what was obtained in the study conducted in Africa where good visual outcome at discharge was found among 23% of total patients. The good results in patients in comparison were due to better selection and regular follow up of the patients. The final result was better than research by Bekibele et al at St. Mary's hospital in October 1998 and October 1999 where the percentage of people with better vision post-operatively is 65.5 %.(16, 17)

One of the largest population based population based survey conducted in Pakistan showed that only one third surgeries of cataract resulted in visual acuity either equal or better than 6/18. The main cause of visual dysfunction was the surgical complications thus emphasizing to improve the surgery quality. Posterior capsular opacity and glaucoma seem to be the principle complications.(18) The recent studies suggested that shift in surgery from extracapsular cataract extraction to phacoemulsification has improved the outcomes. Most of the surgeries performed in our study were phacoemulsification technique for cataract removal.

Study by B Mehmet et al showed that the restoration of vision after cataract surgery is useful even in elderly patients because it maintained their performance of daily activities thus improving their social life.(19) Cataract surgery caused reduction in the proportion of patients who thought they had bad vision related problems to 42-45% in about eight fields of daily living activities.(20) The results of these studies are in accordance with our research suggesting that cataract surgery not only improves visual acuity but also the vision related quality of life.

Researchers revealed that 89.7% of the patients had post-operative visual acuity of 20/40 with phacoemulsification. However in developing countries, researches revealed that most of the eyes operated for cataract surgery did not achieve WHO recommended levels of visual outcome because of not performing phacoemulsification technique routinely.(21)

The strength of our study is application of modern surgical technique, experienced surgeons and exclusion of subject with coexisting ocular diseases. The limitations are lack of long term follow-up of the patients, small sample size and time restriction. Snellen chart is not valid tool for measuring visual acuity; this may have effect on visual results. Lack of use validated questionnaire is also related to poor outcomes. Our results of better outcome are far less in comparison with standards recommended by WHO, probably because of study limitations.

Conclusion

Conclusively, our study indicates that there is restoration of vision after cataract surgery with IOL implantation and this reduce the number of eyes with poor vision after surgery. Better visual results are related to satisfaction of the patients. Restoration of vision improves the self-esteem, communication, social participation and creativity of the patients after surgery.

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