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Research article

The influence of preoperative counselling on the incidence and the adaptation of postoperative dysphotopsia

K. A. Salvin[1]

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Abstract

Dysphotopsia, also known as the post-operative edge effect, is a common complication that can occur after cataract surgery. It is characterized by the perception of abnormal visual sensations. While the exact cause of dysphotopsia is not definitively established, it is widely accepted that the resolution of this issue is primarily achieved through neuroadaptation.

This study has focused on the impact of preoperative counselling on the post-operative adaptation to dysphotopsia. By explaining the possibility and the nature of dysphotopsia to patients preoperatively (phacoemulsification), the study found that it significantly increases the rate of adaptation to dysphotopsia after surgery. Importantly, this counselling did not change the incidence of dysphotopsia, but it did improve patients' ability to adapt to these abnormal visual sensations postoperatively.

Introduction

Dysphotopsia, characterized by the perception of abnormal visual sensations, is a frequent complication following cataract surgery. It encompasses positive phenomena such as glare, halos, streaks of light, and negative phenomena including the loss or reduction of visual phenomena that were present before surgery. These visual disturbances can significantly impact patients satisfaction and quality of life.

Cataract surgery is one of the most frequently performed ophthalmic procedures worldwide, aiming to restore visual acuity by replacing the opacified lens with an intraocular lens (IOL). However, despite advancements in surgical techniques and IOL designs, dysphotopsia remains a clinical challenge. The exact mechanisms underlying dysphotopsia are not fully understood, and various factors contribute to its occurrence.

Several studies have been conducted the etiology, prevalence, and impact of dysphotopsia. IOL design, material, and optics play a significant role in dysphotopsia development. For instance, multifocal IOLs have been associated with higher rates of dysphotopsia compared to monofocal IOLs[1,2]. Furthermore, factors such as IOL edge design, position, and centration within the capsular bag also contribute to dysphotopsia[3,4].

An understanding of the underlying causes and risk factors associated with dysphotopsia is essential for its effective management and prevention. Furthermore, identifying strategies to mitigate dysphotopsia-related symptoms is crucial to optimize patient outcomes.

Neuroadaptation, the process by which the brain adjusts to new visual stimuli, plays a significant role in the perception and recovery of dysphotopsia following cataract surgery. Studies have suggested that neuroplastic changes occur within the visual system to compensate for the abnormal visual sensations associated with dysphotopsia[5,6]. The brain undergoes adaptive processes to integrate and normalize the visual input, resulting in reduced perception of dysphotopsic phenomena over time. This neuroadaptation phenomenon has been observed in patients with various types of dysphotopsia, including glare, halos, and streaks of light[7,8]. However, the extent and speed of neuroadaptation can vary among individuals, with some patients experiencing more rapid resolution of symptoms than others. Understanding the mechanisms underlying neuroadaptation may offer insights into developing strategies to enhance the process and improve patient comfort and visual outcomes.

I have studied four hundred and ten patients who underwent uncomplicated phacoemulsification and intraocular lens implantation to assess the effect of preoperative counselling on postoperative dysphotopsia.

The objective

To evaluate the influence of preoperative counselling of positive and negative dysphotopsia on the incidence and recovery of postoperative dysphotopsia.

[1]*Senior Lecturer, Department of Anatomy, Faculty of Medicine, University of Kelaniya, Sri Lanka.*

Method

The study was performed at the Hemas Hospital Wattala. All cataract patients, physically and mentally healthy otherwise, who underwent uncomplicated phacoemulsification and intraocular lens implantation from 15/08/2022 to 14/11/2022 were included in the study. The patients who underwent both surgeries at the same hospital during the study period were allowed to participate in the study only for their first surgery. Patients who were on treatment for psychological or neurological disorders were not recruited for the study. The patients with the average K reading below 39 and above 48, and the intraocular lens dioptric power below 17 and above 26 were excluded. All the patients were implanted with Alcon acrys of IQ monofocal intraocular lenses. The consecutive patients were grouped into two groups, A and B, based on admission. The patients of group A were explained of positive and negative dysphotopsia using a video created by the same surgeon. The group B was not explained about the details of dysphotopsia but the general side effects and risk of the surgery as usual. All the patients in both groups were explained about the study and consent was taken.

The data were collected preoperatively, on the 1st day, two weeks, and one month postoperatively. A research assistant collected the data directly to an Excel sheet on iPad. The final data was analysed using Winpepi, an open-source statistical software. The ethical clearance and the institutional approval was obtained from the Ethics Committee, Faculty of Medicine, University of Kelaniya and Hemas Hospital, Wattala.

Data

The total number of patients studied is 410.

Table 1. Distribution of the patients by the age

Age range	*Number of patients*	*Percentage (%)*
<31	01	00.24
31-35	26	06.34
36-40	3	0.71
41-45	3	0.71
46-50	10	02.44
51-55	32	07.80
56-60	68	16.59
61-65	71	17.31
66-70	111	27.07
71-75	61	14.87
76-80	24	05.85
Total	**417**	**100.00**

Table 2. Distribution of the patients by gender

Gender	*Number of patients*	*Percentage (%)*
Male	173	42.20
Female	237	57.80
Total	**410**	**100.00**

Table 3. Distribution of the patients by average K readings

Avg K readings	*Number of patients*	*Percentage (%)*
39-40.5	33	8.05
40.5-42	26	6.34
42-43.5	93	22.68
43.5-45	151	36.82
45-46.5	88	21.45
46.5-48	19	4.63
Total	**410**	**100.00**

Table 4. Distribution of patients by the presence of any form of dysphotopsia on the first day, 14th day and one month postoperatively

Group	*Dysphotopsia 1st day post op*	*Dysphotopsia 14th day post op*	*Dysphotopsia one month post op*
A (n=205)	42 (20.49%)	06 (02.92%)	01 (0.49%)
B (n=205)	28 (13.66%)	13 (06.34%)	05 (02.44%)
Total (n=410	**70 (17.07%)**	**19 (04.63%)**	**06 (01.46%)**

Discussion

The age and average K readings of the two groups follow a normal distribution, and there is no statistically significant difference between the two groups. The incidence of any form of dysphotopsia in our study is comparable to that of most other studies, although slightly higher than a clinical trial conducted by Sharma P, et al.[9,10]. However, there is no statistically significant difference in the incidence of postoperative

dysphotopsia between the two groups on day one (P=0.06), day fourteen (P=0.01), or one month (P=0.01) after surgery. Interestingly, the incidence of dysphotopsia reduction or neuroadaptation over the one-month postoperative period is significantly higher in group A (from 20.49% to 0.49%) compared to group B (from 13.66% to 2.44%) (P=0.059).

Conclusion

The preoperative explanation of postoperative dysphotopsia to patients undergoing phacoemulsification increases the rate of adaptation to dysphotopsia postoperatively, despite no change in the incidence.

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