Original Article

Influence of Uveitis in developing Posterior Capsule Opacification in Patients with Phacoemulsification with Hydrophobic Intraocular Lens

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Abstract

Objective: To access the influence of uveitis in developing posterior capsule opacification (PCO) in patients who underwent phacoemulsification cataract surgery with hydrophobic intraocular lens. **Methodology:** This prospective observational study was conducted in cataract department of National Institute of Ophthalmology and Hospital, Dhaka from 1st January, 2022 to 31st December, 2022. After getting informed consent 53 eyes of 45 patients affected by uveitis who underwent phacoemulsification cataract surgery with hydrophobic intraocular lens aged 25-75 years were selected according to the selection criteria and underwent detailed history taking and ocular examination. Follow-up was given at 1, 3 and 6 months interval. PCO formation was assessed by slit lamp examination and data were recorded and analyzed by SPSS Statistics version 26 software. **Results:** Out of 53 eyes of 45 patients posterior capsule opacification (PCO) occurred in 21 eyes (39.62%). The occurrence more commonly seen in young (25-45 years) to middle aged (45-55years) adults than older (55-75years) adults and among them 30 (66.67%) patients were female and 15 (33.33%) patients were male. **Conclusion:** The study shows significant influence of uveitis in developing posterior capsule opacification (PCO) more commonly in young adult female patients who underwent phacoemulsification cataract surgery with hydrophobic intraocular lens which can help to guide prevention, awareness development and targeted intervention for the patients.

Keywords: Uveitis, posterior capsule opacification (PCO), cataract surgery, phacoemulsification, hydrophobic intraocular lens (IOL), slit lamp.

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Introduction

Posterior capsule opacification (PCO), often referred to as secondary cataract, is one of the major post-operative complications following cataract surgery[1,2]. In 20% cases it may occur within a year after cataract surgery and may occur as high as 50% within five years after surgery[3,4]. In PCO, the posterior capsule undergoes secondary opacification due to the migration, proliferation and differentiation of residual lens epithelial cells (LECs) remaining in the capsular bag[5]. The accumulated LECs causes opacification of the posterior capsule resulting negative effect on vision. Potential risk factors to develop PCO include conditions like diabetes, uveitis, myotonic dystrophy, retinitis pigmentosa, pseudoexfoliation, glaucoma, myopia and even trauma[6-10,2,4,11]. Young age[12] and female gender also increase the risk of PCO formation[13]. Intraocular lens (IOL) shape, biomaterial, and size of IOL may also contribute to PCO formation[13,14]. Hydrophobic IOLs are associated with less significant risk of developing PCO than the hydrophilic IOLs[15]. Among all, PCO is a common complication in uveitic cases with variable incidence. The occurrence of PCO in uveitis patients is about 23% to 96%[16]. PCO can significantly deteriorate the quality of vision if it involves the central visual axis[17]. Visual problems associated with PCO include decrease

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in visual acuity, loss of contrast sensitivity and glare. Furthermore, PCO may hamper significant impairment of fundus visualization which leads to poor management of posterior segment disorders[18]. Thus PCO imposes a significant post-operative burden on patient's visual satisfaction as well as health care system. This study may help to build awareness and to take effective measures to avoid uveitis in order to reduce the incidence of PCO formation in cataract surgery patients.

Materials and Methods

This prospective observational study was conducted over 53 eyes of 45 patients affected by uveitis who developed posterior capsule opacification (PCO) after phacoemulsification cataract surgery with posterior chamber hydrophobic intraocular lens (IOL) implantation. The inclusion criteria comprised patients with visually significant cataract or cataract impairing adequate fundoscopy and a minimum period of 3 months with no clinical evidence of inflammation in the anterior chamber prior to surgery. All cases were performed by the same surgeon with minimum handling of iris, uneventful surgery and shorter operative time. Hydrophobic IOL was implanted in the capsular bag in all the cases. Sub-conjunctival injections of gentamicin and dexamethasone were given. Some patients received 40 mg injection of triamcinolone acetate at the orbital floor at the end of the surgery. Each patient received pre-operative topical prednisolone acetate 1% eye drop and slowly tapered over 2-3 months post-operatively based on the degree of intraocular inflammation. Oral prednisolone was started post-operatively as indicated and gradually tapered over 3–4 weeks. Follow-up was given at 1, 3 and 6 months interval. PCO formation was assessed subjectively by dilated slit-lamp examination. Data were recorded, checked and verified properly before analysis. Statistical analysis was carried out by using SPSS (Statistical Package for Social Science) v 26.0 software. P value <0.05 was considered as statistically significant.

Results

s study was conducted over 53 eyes of 45 patients affected by uveitis who underwent phacoemulsification cataract surgery with hydrophobic intraocular lens.

Table 1: Age distribution of the study subjects (n=45)

Age group (Years)	Frequency	Percentage
25 - 35	16	35.55
35 - 45	13	28.89
45 - 55	9	20
55 - 65	3	6.67
65 - 75	4	8.89
Total	**45**	**100.0**

Table- 1 shows the age distribution of the study subjects. Age was considered as discrete value in years and as stated by the study subject. Out of 45 cases 16 patients were 25 to 35 years age, 13 patients were 35 to 45 years age, 9 patients were 45 to 55 years age, 3 patients were 55 to 65 years age and 4 patients were 65 to 75 years age.

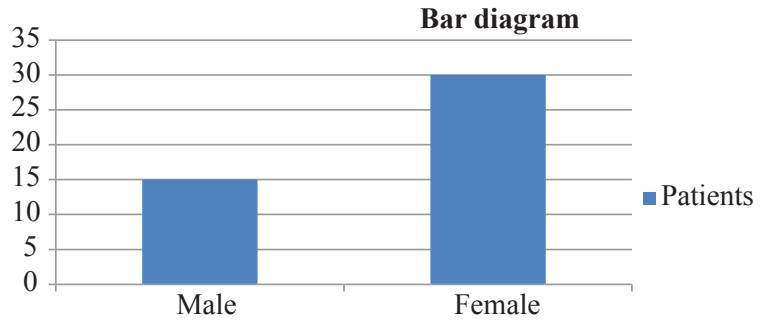

Figure I: Bar diagram showing gender distribution of the study subjects (n=45)

Figure-I shows gender distribution of the study subjects. Out of 45 patients 30 (66.67%) were female and 15 (33.33%) were male. The male female gender ratio is 1: 2.

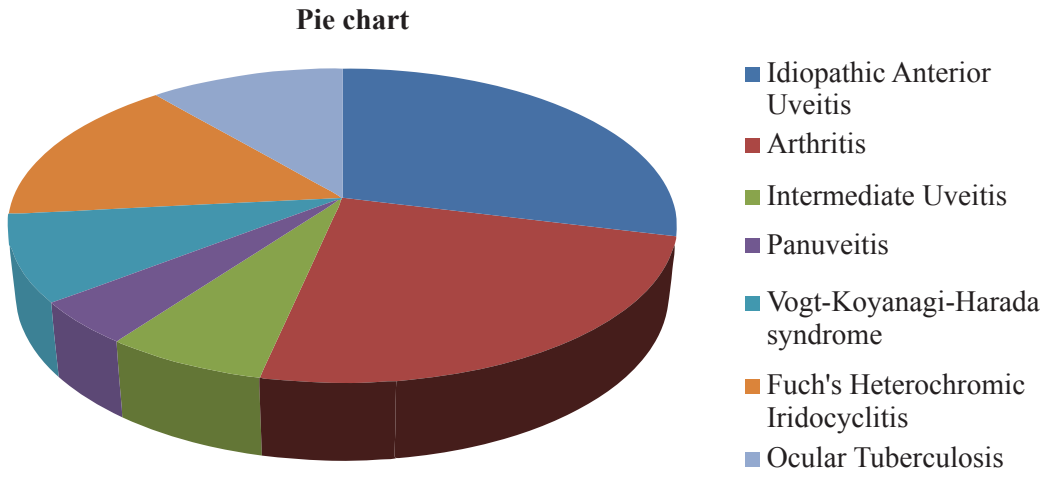

Figure II: Pie chart showing distribution of primary eye diseases as the cause of uveitis in study subjects (n=45)

Figure-II shows the distribution of primary eye diseases as the cause of uveitis in study subjects. Out of 45 patients 13 (28.88%) patients had idiopathic anterior uveitis, 11 (24.44%) patients had arthritis, 3 (6.66%) patients had intermediate uveitis, 2 (4.44%) patients had panuveitis, 4 (8.88%) patients had Vogt-Koyanagi-Harada syndrome, 7 (15.55%) patients had Fuch's heterochromic iridocyclitis and 5 (11.11%) patients had ocular tuberculosis.

Table II: Laterality of the study subjects

Laterality	Number of uveitic patients	Number of uveitic eyes
Unilateral	37	37
Bilateral	8	16
Total	**45**	**53**

Table- II shows laterality of the study subjects. Among 53 eyes of 45 patients, 37 patients were unilaterally affected (37 eyes) and 8 patients were bilaterally (16 eyes) affected by uveitis.

Table- III: Scenario of posterior capsule opacification (PCO) formation in study subjects

Gender	Eyes with PCO formation
Male (15 patients)	6 (28.57%)
Female (30 patients)	15 (71.43%)
Total: 45 Patients (53 Eyes)	**21 (39.62%)**

Table- III shows the scenario of posterior capsule opacification (PCO) formation in study subjects. Among 53 eyes of 45 patients PCO developed in 21 eyes (39.62%), among them 15 eyes (71.43%) were of female patients and 6 eyes (28.57%) were of male patients.

Discussion

The study was conducted on 45 patients (53 eyes) in cataract department of National Institute of Ophthalmology and Hospital, Dhaka to access the influence of uveitis to develop posterior capsule opacification (PCO) in patients who underwent phacoemulsification cataract surgery with hydrophobic intraocular lens (IOL). In this study, the age range was 25-75 years and out of 45 patients 30 (66.67%) were female and 15 (33.33%) were male. The male female ratio is 1:2. The study by Shoughy SS, Jaroudi MO, Tabbara KF., 202019 was done over 25 patients (31eyes), the age range was 26-72 years and there were 9 male and 16 female patients. In this study it was found that among 53 eyes of 45 patients PCO developed in 21 eyes (39.62%), among them 15 eyes (71.43%) were of female patients and 6 eyes (28.57%) were of male patients. The finding is similar to the study done by Shoughy SS., 202019 where PCO developed in 11 eyes (35.5%) out of 31 eyes. The development of PCO varies in different studies like in Estafanous et al. 200120 PCO is 62%, in Kawaguchi et al.200721 PCO is 23.7%, in Yamane et al.200722 PCO is 19%, in Ram et al.201023 PCO is 28.7%, in Lin et al.201414 PCO is 28.6% and in Bhargava et al.20159 PCO is 16.7%. These differences may reflect the variations in genetic factor, disease diversity, healthcare infrastructure, access to health service and treatment response of individuals in the developed and the developing countries.

Conclusion

The study shows significant influence of uveitis in developing posterior capsule opacification (PCO) who underwent phacoemulsification cataract surgery with hydrophobic intraocular lens (IOL). The incidence of PCO was higher in females compared to males and more commonly in younger age group rather than older age. The study finding can help to guide prevention, awareness development and targeted intervention for the patients.

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