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## Original Research Article

## Systemic co-morbidities in patients undergoing cataract surgery

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## ABSTRACT

**Background:** Cataract is most common cause of blindness in the world. As it is an age related change, it is usually associated with other systemic illness.

**Purpose:** To assess the presence of systemic co morbidities found during routine preoperative evaluation in the patients undergoing cataract surgery at tertiary care hospital.

**Method:** Interventional study included patients attending the ophthalmology outpatient department who were operated for cataract surgery between Jun. 2019 and May. 2020 at tertiary health care centre.

**Result:** Out of 412 patients 147 (35.68%) had systemic co-morbidity and 66 had a presence of both systemic and ocular co-morbidity. Out of 147 patients with systemic co-morbidity hypertension was found in 79 (53.74%) patients while 47 (31.97%) presented with Diabetes Mellitus. Bronchial asthma and Ischemic heart disease was observed in 19 (12.93%) patients followed by stroke in 8 (5.44%) patients.

**Conclusion:** Presence of systemic comorbidity increase the number of investigations needed for fitness of the patient for cataract surgery. Also it can cause intra operative complication and may affect surgical outcome.

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## 1. Introduction

Cataract is the cause of half of blindness and 33% of visual impairment worldwide. India is one of the signatory of Vision 2020. Cataract is the principle cause of blindness and visual impairment worldwide affecting approximately 18 million people. The prevalence of cataract in India is 62.6%.<sup>1</sup>

Cataract is most commonly due to aging, but may also occur due to trauma, radiation exposure, be present from birth, or occur following eye surgery for other problems. Risk factors include diabetes, smoking tobacco, prolonged exposure to sunlight, and alcohol.<sup>2</sup>

Systemic comorbidities may be present in as many as 80% of patients.<sup>3</sup> Cataracts are 2-5 times more frequent in diabetic patients and occur at an earlier age. Fluctuating levels of sorbitol, fructose and glucose exert harmful stress to the lens so control of diabetes would prevent fluctuations.

Diabetic retinopathy is present in approximately 4% of cases, but that number is expected to grow due to the increase of type 2 diabetes worldwide.<sup>4</sup> It has been estimated that 20% of all cataract surgeries are performed on diabetic patients,<sup>5</sup> with a surgical rate of 3,400 adults per one million per year in India.<sup>6</sup>

Like Diabetes, a recent meta-analysis concluded that systemic hypertension was found to increase the incidence of posterior sub-capsular cataracts Hypertension induces change in the protein structure of lens capsule.<sup>7</sup> It also alters the membrane transport and permeability of ions with increased intra ocular pressure resulting in exacerbation of cataract formation.<sup>8</sup>

The presence of systemic comorbidities may affect the surgical outcome. The cost of surgery also increases if the cataract patients selected for surgery have associated systemic co-morbidity. The knowledge of systemic co-morbidity reflects the need for extra investigations like 2D Echo, HbA1c, USG etc for the fitness for the surgery.

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Our study aimed to assess the frequency of systemic co-morbidities among the cataract surgery patients at tertiary care centre over a period of 12 months.

## 2. Materials and Methods

### 2.1. Study design

The study was conducted as per the tenets of the Declaration of Helsinki after taking approval from the institutional ethics committee. A total of 412 patients were enrolled in the study after taking their written and informed consent. Patients of all age group who underwent cataract surgery at tertiary care centre were eligible for the study.

### 2.2. Evaluation

Thorough ocular and systemic examination required for cataract extraction were carried out. All routine investigations ocular and systemic were also carried out. Any other investigation as indicated to rule out any systemic co morbidity was also performed. Patient got operated for cataract surgery after obtaining fitness from Anaesthesia department.

## 3. Result

**Table 1:** Distribution of cataract cases according to gender

Gender	No. of patients	Percentage
Male	192	46.6%
Female	220	53.4%
Total	412	100%

The Table 1 shows the distribution of patients according to their gender and respective percentage. Out of 412 patients 53.4% were females and 46.6% males. The female to male ratio was 1.15:1

The Table 2 shows amongst the group of 147 patients having systemic comorbidity it was observed that hypertension was found in 53.74% patients while 31.97% presented with Diabetes Mellitus. Bronchial asthma and Ischemic heart disease was observed in 12.93% of the patients followed by stroke (5.44%). Few patients had Hepatitis B (2.72%), Arthritis (2.72%), Hypothyroidism (1.36%), HIV (1.36%) and other systemic diseases.

The Table 3 shows the distribution of patients according to one or more than one systemic co-morbidity. Out of 147 patients 100 (68.02%) patients had one systemic comorbidity, 40 (21.21%) had two systemic co-morbidity mostly Hypertension + Diabetes Mellitus while 7 (4.76%) patients had three systemic co-morbidity mostly Diabetes Mellitus + Bronchial asthma +Ischemic heart disease.

**Table 2:** Distribution of cataract cases according to presence of systemic co-morbidity

Disease	Total (n=147)	Percentage
Hypertension	79	53.74
Diabetes Mellitus (DM)	47	31.97
Bronchial Asthama (BA)	19	12.93
Ischemic Heart Disease (IHD)	19	12.93
Stroke	08	5.44
HEP B	04	2.72
Arthritis	04	2.72
Hypothyroidism	02	1.36
HIV	02	1.36
Psychiatric Illness	02	1.36
COPD	01	0.68
Dilated Cardiomyopathy	01	0.68
Kidney Disease	01	0.68
Systemic Lupus	01	0.68
Erythematosis (SLE)		

**Table 3:** Cataract cases having more than one systemic co-morbidity

CO-Morbidity	Total
One co morbidity	100
Two co morbidity	40
Three co morbidity	07
Total	147

## 4. Discussion

In the present study, out of 412 patients, 147 (35.68%) had systemic co-morbidity. Anton B. Willerscheidt et al.<sup>3</sup> observed more than two-thirds of the patients (72.6%) had medical co-morbidities.

Out of 412 patients 53.4% were females and 46.6% males. The female to male ratio was 1.15:1.

In the present study, it was observed that amongst the group of 147 patients having systemic comorbidity hypertension was found in 53.74% patients while 31.97% presented with Diabetes Mellitus. Bronchial asthma and IHD was observed in 12.93% of the patients followed by stroke (5.44%). Few patients had Hep B (2.72%), Arthritis (2.72%), Hypothyroidism (1.36%), HIV (1.36%), Psychiatric Illness (1.36%), COPD (0.68%), Dilated Cardiomyopathy (0.68%), Kidney Disease (0.68%) and SLE (0.68%).

Ebiakpo-aboere Sonron et al.<sup>9</sup> study showed that diabetes mellitus was present in 41% (n = 163), while hypertension was present in 45% (n = 182) of the patients. There were more women than men who had diabetes mellitus and hypertension. Patients were also suffering from cardiovascular disease (9%) and high cholesterol (11%). Anton B. Willerscheidt et al.<sup>3</sup> observed more than two thirds of the patients (72.6%) had medical co-morbidities, the most common being systemic hypertension

(38.3%), rheumatologic disease (23.3%), and angina or past myocardial infarction (15.7%).

In a study conducted by Thuan Quoc Pham et al.<sup>10</sup> 653 eyes showed angina (20.2%), previous myocardial infarct (15.0%), diabetes (27.5%) and hypertension (56.3%).

Parthasarathi Sathyan et al.<sup>11</sup> showed 1,351 patients Diabetes mellitus (n=813, 60.18%) and hypertension (n=840, 62.18%) were the most common systemic comorbidity. Other comorbidities included cardiac disorders (n=203), bronchial asthma (n=60), thyroid disorders (n=34), renal diseases (n=1) and HIV + status (n=2). Harshila Jain et al.<sup>12</sup> study on 949 patients showed 127 (13.38%) cases with systemic comorbidity. Out of which hypertension 40(4.21%) followed by Diabetes Mellitus 32(3.37%) followed by pulmonary diseases 24(2.52%). Oro-dental disorders in 15(1.58%) and skin disorders in 7(0.73%). A study Co morbidities among cataract- operated patients in Rural Nepal conducted by Eliya Shrestha et al.<sup>13</sup> on 675 cataract patients showed 321 (47.6%) back pain, 260 (38.5%) arthritis, 120 (17.8%) hypertension and 99 (14.7%) diabetes cases.84 (12.8%). Tülay Karacan Erşekerki et al.<sup>14</sup> showed more hypertension (636 patients - 46.9%) followed by diabetes mellitus (390 patients - 32.6%).

Also to be noted that out of 147 patients who underwent cataract surgery 100 cases (68%) were found to have only one comorbidity. 40 cases (21.21%) were found to have two systemic co-morbidities mostly Hypertension + Diabetes Mellitus, while 7 cases (4.76%) were having three systemic co-morbidity mostly Diabetes Mellitus + Bronchial asthma + Ischemic heart disease.

## 5. Conclusion

Our study shows that there is a need for comprehensive evaluation of systemic diseases. 35.6% patients out of 412 who got admitted for cataract surgery at our institute reflected to have systemic comorbidity. Presence of systemic comorbidity increase the number of investigations needed for fitness of the patient for cataract surgery. Also it can cause intra operative complication and may affect surgical outcome.

## 6. Source of Funding

Nil.

## 7. Conflicts of Interest

There are no conflicts of interest.

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