

## How Does a Cataract Raise the Alarm in the Patient about the Cardio Vascular Condition?

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### What are cataracts and their associated symptoms?

Cataracts are caused by the opacification of the lenses of the eyes. They are associated with symptoms such as blurring of vision and colored halos etc., which are responsible for severe psychological issues for the affected individuals [1]. Cataracts usually occur due to aging and some endocrinal diseases. The other common associated risk factors include smoking, hypertension, diabetes, obesity, exposure to UV rays, and steroid medication use [1].

Dr. Mathew Gorski, a renowned Ophthalmologist from New York, states that Cataract reminds every patient to get their eyes examined regularly at six months intervals when they have specific medical conditions [2]. A research team led by Dr. Mingguang of Melbourne conducted a study on 15,000 American patients aged 40 years and older and found a 36 percent higher risk of death due to cardiovascular disease in people who had cataract surgery. At the same time, the risk of death was only 13 percent higher with other diseases [2].

Cardiovascular diseases were found more prevalent among cataract patients in a large cohort of about thirteen thousand cataract patients undergoing cataract surgery and about twenty-six thousand controls [3].

Cataract patients even after they had undergone surgery are likely to develop depression more than those without the Cataract and are at higher risks of developing CVD [4].

### Is cataract blindness preventable and why is it important to address?

India recently released the RAAB (Rapid Assessment of Avoidable Blindness) survey representing 31 districts across 24 states in India. The achievements of the last decade have been fascinating, with India reaching the target reduction of blindness and visual impairment by nearly 47% and 52%, respectively, which is indeed praiseworthy [3]. Based on this survey, the extrapolated number of visually impaired people in India is reduced to nearly 34 million compared to WHO estimates of 62 million in 2010 [3]. There is anecdotal evidence to suggest that the increase in the prevalence of blindness and visual impairment has been reversed in recent years, despite the ever-increasing and more elderly population [5].

In spite of the significant reduction in the burden of blindness, untreated cataract remains the major challenge for the country. It is still persisting as the major cause of blindness and visual impairment since the inception of the national program for the control of blindness [5]. India has achieved high cataract surgical coverage and currently, nearly 65 lakh cataract surgeries are performed every year with an average cataract surgical rate of more than 5000 surgeries per million population per year [5].

CVDs and their risk factors were found more prevalent among cataract patients who planned for cataract surgery. A significant association of the following with cataract formation was found: Diabetes, Coronary Artery Disease (CAD), Hypertension (HTN), Tobacco use, Ischemic Heart Disease (IHD), Chronic Renal Failure (CRF), and hyperlipidemia [6].

### What are the mechanisms that lead to the development of Cataracts and cardiovascular diseases?

Oxidative stress could be a common factor responsible for the narrowing of arteries and the formation of cataracts [2]. In addition, they found that depression was one more factor seen in people who had cataracts, which could increase the risk of heart disease in them<sup>2</sup>. High blood pressure is also considered a risk factor for macular degeneration. Free radicals generate the oxidative damage of lipoproteins that leads to the development of cataracts and an increased risk of cardiovascular disease [7].

Diabetes and smoking induce oxidative damage to the lens are important in the development of Cataracts. Constant exposure to light and ambient oxygen makes the lens sensitive to photooxidative damage, and generalized tissue response to oxidative stress causes CVDs and cataract [7].

Inflammatory mechanisms causing elevated serum CRP and interleukin-6, elevated serum lipids are commonly observed among cataract patients. Elevated levels of linolenic acid and linoleic acid are associated with a higher risk of nuclear cataracts [7].

### What is the incidence of different types of cataracts with hypertension?

Another study by Mylona I, *et al.* has studied 812 patients in Greece undergoing unilateral cataract surgery to determine and identify the most critical risk factor associated with Cataracts. In the study sample, there was no incidence of diabetes as the single risk factor for Cataracts<sup>4</sup>. However, hypertension was a single prominent risk factor for various types of cataracts<sup>6</sup>. Nearly 43.8 percent of subcapsular, 28.6 percent of cortical, 27.6 percent mixed, and 24.3 percent of nuclear cataracts are associated with hypertension as the single prominent risk factor [6].

### Is there a higher risk of death due to cardiovascular events after cataract surgery?

Nemet A Y conducted a retrospective observational case-control study of 50 years and older who underwent cataract surgery in Israel. The study population was matched for age and gender and found that cataracts were significantly lower in the population of Ashkenazi origin. They analyzed the odds ratio of risk factors of CVDs and other diseases. They concluded that the odds ratio (OR) was highest for CAD (OR = 1.51), followed by diabetes (OR = 1.50), peripheral vascular disease (OR = 1.42), and HTN (OR = 1.35) [7].

A prospective cohort study of Swedish women states that metabolic syndrome-HTN, abdominal adiposity, diabetes shows a significant risk of Cataract development. Another prospective study conducted on women nurses by Hu, *et al.* showed a considerable risk of mortality from coronary artery disease with cataract extraction (RR = 1.37) [7]. In addition, during a 5-year follow-up prospective cohort study of male physicians with self-reported Cataracts, the relative risk of fatal cardiovascular events was nearly RR = 1.34 [7].

The most common cardiovascular disorder seen in both males and females with Cataracts was coronary artery disease. A possible mechanism could be reduced circulation to the eye that has the blood supply of the carotid artery [7].

### Why is it important to raise awareness about Cataracts and associated CVDs?

In spite of the fact that the prevalence of cataract blindness would decrease, with a gradual rise in the number of cataract surgeries during this period, seeing the population growth in the group of fifty years and above, the actual number of cataract blind would increase in the last decade from 7.75 million in 2001 to 8.25 million in 2020 [8].

In addition, Cataracts can cause significant turmoil for individuals suffering from this ailment and their loved ones as they become physically and economically dependent. Based on the current evidence that displays a higher mortality risk of vascular events and cardiovascular disorders in patients with cataracts and cataract surgeries, it is the responsibility of the public health professionals, ophthalmologists, and optometrists, to educate the general public about the correlation between Cataracts and CVDs.

Conducting more randomized controlled trials on the association of CVDs and cataracts can contribute to more significant evidence on this important issue. However, based on the current evidence and understanding of the shared mechanism of cardiovascular diseases, if awareness about the risk factors of Cataracts increases among the public, we can reduce the incidence of Cataracts to an extent.

To conclude, all patients who have cataracts and have undergone treatment should have a regular eye examination and visit their physician to track their history of blood pressure, diabetes, and other vascular disorders. Early intervention and prevention can cause a significant reduction in morbidity related to cataracts and heart diseases if timely intervention is done.

### Bibliography

1. Cataract. Stanford Health Care (SHC) - Stanford Medical Center (2021).
2. Cataracts tied to higher odds of death from heart disease ... (n.d.) (2021).
3. <https://www.nature.com/articles/eye201034#:~:text=As%20free%20radical%2Dmediated%20oxidative,risk%20of%20coronary%20heart%20disease>
4. <https://www.opthalmologytimes.com/view/study-cataract-surgery-linked-to-increased-risk-of-heart-attack-stroke>
5. Chief. (n.d.). Indian Community Eye Care in: Achievements and...: Indian Journal of Ophthalmology. LWW (2021).
6. Mylona I, *et al.* "Hypertension is the Prominent Risk Factor in Cataract Patients". *Medicina* 55.8 (2019): 430.
7. Is cataract associated with cardiovascular morbidity? Medscape (2021).
8. Murthy G., *et al.* "Current status of Cataract Blindness and vision 2020: The right to sight initiative in India". *Indian Journal of Ophthalmology* 56.6 (2008): 484-494.

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