

**LENS INDUCED GLAUCOMA: AN AUDIT OF CATARACT CASES IN TEACHING HOSPITAL BADULLA FROM 2022 TO 2023**Wannigama E<sup>1</sup>, Gunarathne HWNN S<sup>2</sup>*<sup>1</sup>Consultant Ophthalmologist Provincial General Hospital Badulla, Sri Lanka, <sup>2</sup>Consultant Dermatologist Provincial General Hospital Badulla, Sri Lanka*Corresponding Author: [erandamailbox@gmail.com](mailto:erandamailbox@gmail.com)**INTRODUCTION**

Lens-induced glaucoma is a secondary form of glaucoma characterized by increased intraocular pressure (IOP) resulting from lens-related factors that obstruct the normal aqueous humor outflow pathways. This condition is particularly prevalent in regions with limited access to eye care services and is often associated with mature or hypermature cataracts. Several distinct forms of lens-induced glaucoma have been identified, including phacomorphic glaucoma, which is caused by a swollen lens pushing the iris forward and leading to angle closure, and phacolytic glaucoma, which results from the leakage of lens proteins from a hypermature cataract, causing trabecular meshwork obstruction through an inflammatory response. Other types include lens particle glaucoma, which follows lens trauma or surgery with lens fragments blocking the trabecular meshwork, and phacoanaphylactic glaucoma, where an autoimmune reaction against lens proteins induces inflammation and elevated IOP. Effective management typically involves initial medical therapy to lower IOP, followed by

surgical intervention such as cataract extraction to remove the obstruction and restore normal aqueous flow, with anti-inflammatory treatments being utilized when indicated (Bhat & Natarajan, 2018; Kim et al., 2019; Salim & Shields, 2014).

The prevalence of lens-induced glaucoma varies considerably across different regions, largely influenced by the availability of cataract surgery and eye care services. It is more common in developing countries where access to eye care is limited, resulting in a higher incidence of advanced cataracts. In some low-resource settings, lens-induced glaucoma accounts for a substantial proportion of secondary glaucoma cases. For instance, studies from South Asia and sub-Saharan Africa indicate that lens-induced glaucoma is responsible for 6% to 17% of all glaucoma cases, reflecting the significant public health burden posed by untreated cataracts in these regions (Bhat & Natarajan, 2018). In contrast, developed countries with widespread access to cataract surgery and routine eye examinations report a much lower prevalence, as early detection and timely

surgical management prevent the progression of cataracts to stages that cause lens-induced glaucoma.

Lens-induced glaucoma imposes a significant burden on healthcare systems, particularly in regions where the condition is prevalent. The management of this condition often involves surgical intervention to extract the cataract, which can be resource-intensive. In low-resource settings, where access to surgical facilities and ophthalmic specialists may be limited, patients often present with advanced disease requiring more complex and costly management. The direct healthcare costs associated with treating lens-induced glaucoma include surgical expenses, medications for controlling IOP, and postoperative care, while indirect costs may include loss of productivity and caregiving needs. Moreover, untreated or inadequately managed cases can result in irreversible vision loss, adding to the socioeconomic burden of blindness and low vision in affected populations (Salim & Shields, 2014). This highlights the need for health systems to prioritize the prevention and timely management of lens-related causes of glaucoma.

Lens-induced glaucoma is a largely preventable condition through the timely detection and management of cataracts. Early identification of cataracts through routine eye examinations allows for cataract surgery before the lens becomes hypermature or swollen, reducing the risk of subsequent glaucoma development. In addition to regular eye exams, public health initiatives aimed at increasing

awareness of cataracts and their complications can encourage individuals to seek medical attention earlier, further reducing the incidence of lens-induced glaucoma (Resnikoff et al., 2020). Screening programs targeting older adults and high-risk groups, particularly in low-income regions, can facilitate early detection and prompt surgical intervention. Increasing the availability and affordability of cataract surgery through outreach programs and mobile eye clinics is crucial for the prevention of this condition, particularly in underserved areas.

Timely evaluation and management of patients with lens-induced glaucoma are critical to preventing irreversible optic nerve damage and vision loss. Early diagnosis allows for prompt intervention to lower IOP and surgically address the lens-related cause, thereby preserving visual function. Delays in treatment can lead to prolonged periods of elevated IOP, resulting in damage to the optic nerve and a higher likelihood of permanent visual impairment. Moreover, the inflammatory component associated with certain types of lens-induced glaucoma, such as phacolytic glaucoma, can exacerbate damage if not promptly controlled (Kim et al., 2019). Regular monitoring of patients who present with advanced cataracts or symptoms suggestive of glaucoma can facilitate early detection, enabling effective management before significant harm occurs.

Lens-induced glaucoma remains a significant public health issue, particularly

in regions with limited access to eye care services. The condition is preventable with appropriate public health measures, such as regular eye examinations, early cataract detection, and timely surgical intervention. Despite the challenges in management, prioritizing prevention and

timely evaluation can mitigate the healthcare burden and improve patient outcomes. Investing in eye health infrastructure and public awareness programs is essential to reducing the prevalence and impact of lens-induced glaucoma worldwide.

**METHODS AND RESULTS**

28 patients presented to eye clinic at Badulla hospital were reviewed. Mild female predominancy were observed (n=16: 57.2%). Patients often experience significant eye pain and discomfort (n=18:64.2%). Blurred vision or sudden vision loss was a common complaint of all patients (n=28:100.0%). The extent of visual disturbance may correlate with the degree of IOP elevation and the duration of the

glaucoma. Conjunctival hyperemia, or eye redness (n=12:42.8%). Elevated IOP can cause corneal swelling, leading to a cloudy or hazy appearance were observed in 57.2% of patients(n=16). Shallow anterior chamber and angle closure were observed in 28.6% Of patients(n=8). Symptoms such as headache, nausea, and vomiting were accompanied in least number of patients.

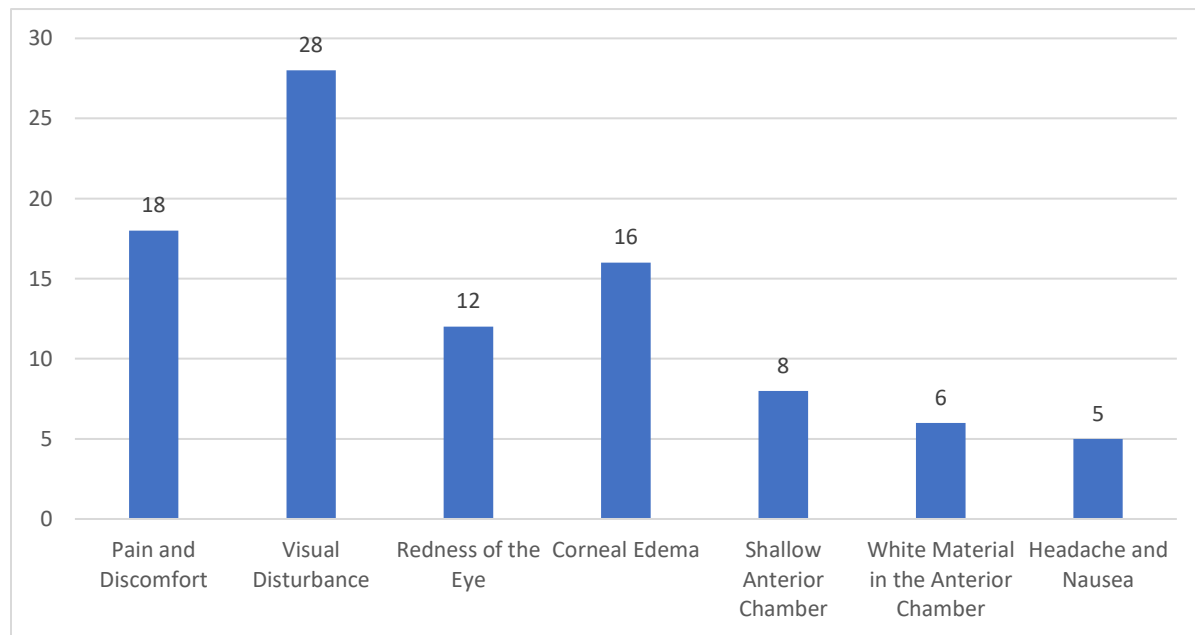


Figure 1 : Distribution of Clinical presentations of patients

## **DISCUSSION**

Managing lens-induced glaucoma presents several healthcare challenges, particularly in low-resource settings where access to timely eye care may be limited. The main challenges include late presentation, limited access to ophthalmic surgical services, and the need for specialized equipment and expertise. In comparison to treating other forms of glaucoma, addressing lens-induced glaucoma often requires not only medical management to lower intraocular pressure (IOP) but also surgical intervention to remove the underlying cause, such as a cataract. Additionally, inflammation control is essential in cases where lens protein leakage has triggered an immune response.

Lens-induced glaucoma poses significant healthcare challenges, particularly in low-resource settings where timely access to eye care is often limited. Unlike primary open-angle or angle-closure glaucoma, lens-induced glaucoma is secondary to conditions affecting the lens, such as mature cataracts or lens trauma, which obstruct the normal outflow of aqueous humor and lead to elevated intraocular pressure (IOP). The management of lens-induced glaucoma not only involves medical treatment to reduce IOP but also requires surgical intervention to address the underlying cause, such as lens extraction. Consequently, the healthcare system faces multiple hurdles, from late presentation and diagnosis to limited surgical facilities, making it difficult to

manage the condition effectively and prevent complications.

One of the main challenges in treating lens-induced glaucoma is late presentation. Patients in regions with limited eye care access often do not seek medical help until the symptoms become severe, such as marked eye pain, significant vision loss, or pronounced redness. This delay in seeking care is exacerbated by the lack of routine eye examination services and awareness about the importance of early detection. As a result, many cases are diagnosed at an advanced stage when optic nerve damage has already occurred, rendering treatment less effective in preserving vision. In contrast, early detection and intervention can halt disease progression and improve visual outcomes, underscoring the need for regular eye screening programs.

Another challenge lies in the availability and accessibility of surgical facilities. Managing lens-induced glaucoma often necessitates cataract extraction to eliminate the cause of elevated IOP. However, surgical facilities and specialized equipment, such as phacoemulsification machines, may not be readily available in low-resource areas. Even when surgical services are present, a shortage of skilled ophthalmologists can limit the number of procedures performed, leading to long waiting times for cataract surgeries. Furthermore, the financial burden associated with surgery, including both direct and indirect costs,

can deter patients from seeking timely treatment, especially in regions where healthcare is not universally affordable. Consequently, these limitations often result in prolonged periods of elevated IOP, increasing the risk of permanent optic nerve damage.

Postoperative care and follow-up represent additional challenges in the management of lens-induced glaucoma. Adequate postoperative monitoring is essential for detecting complications such as persistent elevated IOP, corneal edema, or secondary infections. However, in remote or underserved regions, follow-up care may be inconsistent due to logistical issues, patient compliance barriers, or inadequate healthcare infrastructure. The lack of proper postoperative management can compromise the success of surgical intervention and worsen visual outcomes. Therefore, strengthening follow-up protocols and enhancing patient education on the importance of postoperative care are crucial steps in mitigating these risks.

In light of the significant challenges associated with treating lens-induced glaucoma, prevention emerges as a more effective and practical approach. Preventive strategies focus on the early identification and management of cataracts, the leading cause of lens-induced glaucoma. Regular eye examinations can help detect cataracts at an early stage, allowing for timely surgical intervention before the cataract matures and obstructs aqueous humor outflow. By

addressing cataracts early, the incidence of lens-induced glaucoma can be significantly reduced, alleviating the burden on healthcare systems and preserving patients' vision.

Public awareness campaigns play a vital role in prevention by educating the community about the importance of routine eye check-ups and recognizing early signs of cataracts. Such initiatives can improve patient health-seeking behavior, leading to earlier intervention and better visual outcomes. Additionally, improving access to cataract surgery through government-supported programs, outreach initiatives, and mobile eye clinics can bridge the gap in underserved areas, ensuring timely and affordable care. Expanding these services can help prevent the development of lens-induced glaucoma and reduce the associated healthcare costs.

Implementing targeted screening programs for high-risk populations, such as older adults and individuals with a family history of eye diseases, can further enhance prevention efforts. Early detection in these groups allows for timely management, which can prevent the progression of cataracts to a stage where they significantly increase IOP. These strategies shift the focus from managing late-stage disease to preventing the onset of glaucoma, ultimately leading to better health outcomes and a reduction in blindness caused by preventable conditions.

## CONCLUSION

The management of lens-induced glaucoma poses substantial healthcare challenges, especially in settings with limited resources. Late presentation, limited surgical access, and inadequate postoperative care hinder effective treatment and increase the risk of permanent vision loss. Given these obstacles, prevention through early cataract detection

and timely surgical intervention offers a more sustainable and effective approach. Strengthening eye health services, promoting public awareness, and implementing screening programs for high-risk groups are crucial steps toward reducing the incidence of lens-induced glaucoma and alleviating the associated healthcare burden.

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