e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(8); 907-910

Original Research Article

Management of Secondary Glaucoma in Tertiary Care Centre in Western Odisha

Kanhei Charan Tudu[1], Pramod Kumar Sharma[2], Bikash Ranjan Nayak[3], Sharmistha Behera[4]

[1]Associate Professor & HOD, Department of Ophthalmology, VSSIMSAR, Burla, Odisha, India
[2]Assistant Professor, Department of Ophthalmology, VSSIMSAR, Burla, Odisha, India
[3]Senior Resident, Department of Ophthalmology, VSSIMSAR, Burla, Odisha, India
[4]Associate Professor, Department of Ophthalmology, VSSIMSAR, Burla, Odisha, India

Received: 10-06-2023 / Revised: 19-07-2023 / Accepted: 15-08-2023
Corresponding author: Dr. Kanhei Charan Tudu
Conflict of interest: Nil

Abstract:

Background: Glaucoma's characterized by secondary angle closure differ from glaucomas characterised by primary angle closure (PACG). In contrast to primary angle closure glaucoma, secondary angle closure glaucoma is characterised by identifiable contributory factors for angle closure and obstruction of aqueous flow, which are typically unaffected by iridotomy. Each type of secondary angle closure glaucoma is managed differently; therefore, diagnosing the underlying cause is essential for its effective treatment. This study's objective was to assess the significance of these management plans.

Methods: This investigation was conducted between March 2021 and April 2023 at the Department of Ophthalmology, VSSIMSAR, Burla, Sambalpur, Odisha. All patients who visited the glaucoma clinic were enrolled in this investigation, their glaucoma was classified, and the appropriate treatment was initiated to achieve the 15 mmHg target pressure.

Findings: 212 patients were examined in total. The number of male patients was greater than that of female patients by 66.04 percent. Among secondary glaucomas, inflammatory glaucomas were the most prevalent, constituting 28.30% of all cases. The age cohort between 51 and 60 years represented 28.30% of all primary glaucoma cases. Oral and intravenous hyperosmotic drugs were administered, along with topical B blockers, miotics, sympathomimetic, prostaglandin analogues, hyperosmotic drugs and steroids. Trabeculectomy was the most prevalent surgical option for controlling intraocular pressure. Yag laser iridotomies were also performed when necessary. Control of intraocular pressure and visual outcome is quite satisfactory following treatment.

Conclusion: The most prevalent cause of secondary glaucoma is inflammatory glaucoma. They could be effectively managed if they were timely. In addition to steroids, medical antiglaucoma therapy serves an important role in the treatment of glaucoma. Trabeculectomy is highly efficacious in cases of resistance.

Keywords: Secondary Glaucoma, Phacomorphic Glaucoma, Uveitic Glaucoma, Lens Induced Glaucoma.

Introduction

In secondary angle closure glaucoma, the underlying cause can directly close the angle via angle factors and the iris or acting to advance the crystalline lens, creating a pupillary block [1, 2]. This is important because these secondary pupillary block patients might respond to laser iridotomy. They are common causes of glaucoma and can lead to elevated intraocular pressure (IOP) and ocular morbidity [3]. Few studies have distinguished secondary glaucoma as a separate entity, but it is estimated that 6 million people worldwide have secondary glaucoma, as opposed to the 67 million who have primary glaucoma. Secondary glaucoma accounts for 6 percent of newly diagnosed cases in India each year [4]. Secondary glaucoma has numerous causes. It has been observed that cataracts, infectious uveitis and trauma are distinct risk factors for the development of secondary glaucoma. In developing nations, these are common causes of blindness [5, 6]. The development of complications is significantly influenced by a lack of facilities in remote peripheries, poverty, illiteracy, ignorance, and inadequate administration [7]. Topical anti-glaucoma medications, such as topical B blockers, cholinergic agonists, and carbonic anhydrase inhibitors topical, prostaglandin analogues, as well as intravenous, oral and systemic hyperosmotic agents, are among the most widely available treatments for glaucoma. Topical NSAIDs and steroids are effective treatments for inflammatory glaucoma [8]. In categories of secondary glaucoma characterised by angle closure, YAG laser

iridotomies play a crucial role. If medical treatment fails, the only remaining option is to endure a trabeculectomy. Despite the limited number of studies conducted globally on this specific phenomenon. According to Quigley's study, the global prevalence of secondary glaucoma is estimated to be 6 million individuals, while primary glaucoma affects around 67 million individuals [8]. Ramakrishnan R et al. [9] conducted a study that revealed a secondary glaucoma incidence rate of 0.7%. Compared to the overall rate of glaucoma (2.6%), this incidence was significantly higher. In a study conducted by Das J et al. in northern India, 6.72 per cent of the patients were found to have secondary glaucoma [10]. Ritu Gadia and associates at the All India Institute of Medical Sciences (AIIMS), New Delhi, found in a retrospective study [11] that 22.07 per cent of all glaucoma patients were diagnosed with secondary glaucoma.

A Pakistani study [12] observed an incidence rate of 35 per cent for secondary glaucoma, whereas a Finnish study [13] reported a prevalence rate of 33 per cent. In a study undertaken by Yamamoto et al. [14] on the Japanese population, investigators determined that the overall prevalence of secondary glaucoma was 0.6%, while the incidence of primary angle closure glaucoma accounted for 0.5 per cent of the estimated 5% incidence of glaucoma.

This study demonstrates the disparities in the incidence of secondary glaucoma across several global locations.The primary aim of our study was to investigate the aetiology of different subtypes of secondary glaucoma observed in our glaucoma clinic, as well as to assess the effectiveness of different treatment strategies employed for managing these glaucomas.

Methods

The present investigation was carried out in the Department of Ophthalmology, Veer Surendra Sai Institute of Medical Sciences and Research, Burla, Sambalpur, Odisha, spanning from March 2021 to April 2023. The individuals who were enrolled in the study were registered as patients at our glaucoma clinic.

A comprehensive medical history was obtained, including information regarding the patient's sex, age, symptoms' duration and onset, as well as any relevant diabetes history, steroid usage, hypertension, prior ocular surgery or trauma. An extensive ophthalmological assessment comprises the evaluation of visual acuity using Snellen's chart, inspection of the anterior segment by slit lamp bio microscopy, and measurement of intraocular pressure using Schiotz's tonometer. Medical history obtained also included a detailed account of any ocular problems as well as the presence of any acute or chronic systemic illnesses. The researcher recorded data pertaining to visual acuity, slit lamp examination, intraocular pressure, goniocopic, and fundoscopy and perimetry findings on a pre-established form.

The observations made included several ocular characteristics such as corneal clarity, corneal edoema, the presence of posterior and anterior synechia, iris atrophy and iris neovascularization. Additionally, detailed examination of the fundus revealed information regarding the state of the cup-disc ratio, optic disc, neovascularization and retinal haemorrhages. Each patient's treatment regimen was recorded on the Performa, with 15 mmHg intraocular pressure as the target. At follow-up visits, any changes to the treatment and, if surgical treatment was performed, the specifics of the procedure were recorded. IOP was measured using the applanation technique at each visit. Periodically, gonioscopies and perimetries were re-evaluated.

Results

A total of 212 glaucoma patients who presented in the Department of Ophthalmology, Veer Surendra Sai Institute of Medical Sciences and Research, Burla, Sambalpur, Odisha. 66.04% of patients were male, while only 33.96% were female (Table 1). The highest frequency was in the age range of 51-60 years old (28.30%), with second highest frequency in the age range of 61-70 years old (18.87%).

Table 1: Age and sex distribution

Age		
Range	Frequency	Percentage
1-10	2	0.94%
11-20	4	1.89%
21-30	20	9.43%
31-40	30	14.15%
41-50	34	16.04%
51-60	60	28.30%
61-70	40	18.87%
71-80	22	10.38%
	Gender	
Male	140	66.04%
Female	72	33.96%

Inflammatory glaucoma was the most prevalent form of secondary glaucoma, which affected 90 patients. There were 62 pseudophakic patients (29.25%), of which 20 had anterior chamber implants and 42 had posterior chamber implants. Four patients (1.89%) exhibited aphakic glaucoma with pupillary block. 24 (11.32%) patients presented with chronic anterior uveitis and glaucoma. 24 patients (11.32%) presented with traumatic glaucoma.

This was linked to either angle-recession glaucoma or hyphema and traumatic cataract. In 18 patients (8.49%), diabetic eye disease was associated with glaucoma. 14 (6.60%) patients presented with secondary glaucoma as a consequence of hypertension.

In the lens-induced group, 14 patients (6.60%) presented with both phacomorphic glaucoma and phacolytic glaucoma each. 12 patients (5.66%) were diagnosed with glaucoma associated with pseudoexfoliation. 6 (2.83%) patients in the neovascular glaucoma group were diabetic, and two (1.89%) had central retinal vein occlusion (CRVO) (Table 2).

Table 2: Types of secondary glaucoma and their management

Secondary glaucoma	Frequency	Percentage
Pseudophakia	62	29.25%
Aphakia with papillary block	4	1.89%
Chronic anterior uveitis	24	11.32%
Traumatic	24	11.32%
Diabetic eye disease	18	8.49%
Hypertensive patients	14	6.60%
Diabetic	6	2.83%
CRVO	4	1.89%
Phacomorphic	14	6.60%
Phacolytic	14	6.60%
Pseudoexfoliation	12	5.66%
Habitual tobacco user	10	4.72%
Retinal detachment surgery with silicon oil	6	2.83%
Steroid induced	4	1.89%

Discussion

The incidence of morbidity and visual impairment attributable to angle-closure and primary open-angle glaucomas in the developed world. In recent times, the developing world has been relatively well documented by population surveys. However, the majority of researchers have paid little consideration to blindness due to secondary glaucomas. In addition to pain and ocular distress, individuals with secondary glaucoma frequently experience a significant decrease in visual acuity, prompting them to seek prompt medical attention. Consequently, the majority of these are self-reported [15].

According to a study conducted in New Delhi to identify the many causes of secondary glaucoma, nearly fifty per cent of secondary glaucoma is attributed to glaucoma-associated and aphakic glaucoma with complications of mature cataracts [16]. This percentage is extremely high in comparison to the findings of our study (11.32% for lens-induced glaucoma and 1.89% for aphakic glaucoma), indicating that cataract surgery techniques have considerably improved, and surgeons are more competent. Comparable to our research, the prevalence of traumatic glaucoma was 11.32%, neovascular glaucoma was 4.72%, glaucoma owing to chronic uveitis was 8.2%, and steroid-induced glaucoma was 6.8%.

In our investigation, 11.3% of patients had secondary glaucoma owing to uveitis, whereas a study conducted in Boston, Massachusetts, found that 9.6% of patients did, with chronic anterior uveitis being the most prevalent entity [17]. The surgical treatment of secondary glaucoma following silicone oil injection for complex retinal detachment may result in outstanding IOP control. Patients undergoing silicone oil removal alone to control IOP are more likely to experience persistent elevation of IOP, whereas those undergoing silicone oil removal and glaucoma surgery are more likely to experience hypotony [18].

In our study, 4.7% of the total number of patients with secondary glaucoma was chronic tobacco users, a group that is intriguing. According to a study conducted in the same department regarding tobacco-related eye disease, 16.9% of male patients and 20.5% of female patients who were regular tobacco users had secondary glaucoma [12]. The adverse effects of tobacco on ocular circulation and intraocular pressure have been identified [13]. According to a separate investigation [14], smokers have an elevated mean intraocular pressure. Tobacco may have an effect on the aqueous outflow

channels of Schelmm's canal, which are partially controlled by the autonomic nervous system.

The trabecular meshwork is innervated by a plexus of delicate axons without specialised terminals that terminate in the endothelium of the canal of Schlemm. Nerves are produced by the trigeminal and sympathetic nervous systems [15]. The toxic and ischemic effect that causes vascular insufficiency in the optic nerve head supplied by the short posterior arterioles of Haller-Zinn [16] is another possible mechanism.

Conclusion

It was determined that there are numerous causes of secondary glaucoma, but intraocular inflammation is primarily responsible for these forms of glaucomas.

They can be effectively managed with conservative medical treatment, but if this fails, only surgery remains.

References

1. Das J, Bhomaj S, Chaudhuri Z, et al. Profile of glaucoma in a major eye hospital in North India. Indian J Ophthalmol. 2001; 49(1):25-30.
2. Khan MD, Quraish ND, Khan MA. Facts about status of blindness in Pakistan Pak J Ophthalmol. 1999; 15: 15-9.
3. Krishnadas R, Ramakrishnan R. Secondary Glaucomas. The Tasks ahead. Community eye health. 2001; 14: 40-2.
4. Pozzi SAP, Wahieg R, Roasen B, et al. Secondary glaucoma in Paraguay. Etiology and medicine Ophthalmology. 1999; 96: 359- 63.
5. Jafers BL, et al. World Health Organization PBC/94.40 Global data on Blindness an update.
6. Anthony JH. Secondary glaucoma clinical and Experimental Optometry. 2000; 83: 190-4.
7. Baber FT, Saeed N, ZubairM, et al. Two year audit of glaucoma admitted patients in Hayatabad Medical Complex Peshawar. Pak J Ophthalmol. 2003: 19: 32-40.
8. Quigley HA. The number of people with glaucoma worldwide. Br J Ophthalmol. 1996; 80: 389-93.
9. Ramakrishnan R, Nirmalan PK, Krishnadas R, et al. Glaucoma in a rural population of southern India: The Aravind comprehensive eye survey. Ophthalmology. 2003; 110(8):1484-1490.
10. Das J, Bhomaj S, Chaudhuri Z, et al. Profile of glaucoma in a major eye hospital in North India. Indian J Ophthalmol. 2001;49(1):25-30.
11. Gadia R, Sihota R, Dada T, et al. Current profile of secondary glaucomas. Indian J Ophthalmol. 2008; 56(4):285-289.
12. Qureshi MB, Khan MD, Shah MN, et al. Glaucoma admissions and surgery in public sector tertiary care hospitals in Pakistan: results of a National study. Ophthalmic Epidemiolol. 2006; 13(2):115-119.
13. Teikari JM, O'Donnell J. Epidemiologic data on adult glaucomas: data from the hospital discharge registry and the registry of right to free medication. Acta Ophthalmol (Copenh). 1989; 67(2):184-191.
14. Yamamoto T, Iwase A, Araie M, et al. The Tajimi Study report 2-prevalence of primary angle closure and secondary glaucoma in a Japanese population. Ophthalmology. 2005; 112(10):1661-1669.
15. Shaikh A, Alam P, Sami MS. Tobacco related eye diseases. Pak J Ophthalmol. 1999; 15: 113-6.
16. Agarwal HC, Sood NN, Kalra BR, et al. Secondary glaucoma. Indian J Ophthalmol. 1982; 30: 121-4.
17. Lloves MJ, Power JW, Rodriguez A, et al. Secondary glaucoma in patients with uveitis. Ophthalmologica. 1999; 213: 300-4.
18. Donal L, Bundez MD, Katia E, et al. Surgical Management of secondary glaucoma after pars plana vitrectomy and silicon oil injection for complex retinal detachment. Ophthalmology. 2001; 108; 1028-32.