ECRONICON OPEN ACCESS

EC OPHTHALMOLOGY
Guest Editorial

Glaucoma Again, but Which One?

Marianne L Shahsuvaryan*

Professor, Department of Ophthalmology, Yerevan State Medical University, Yerevan, Armenia

***Corresponding Author:** Marianne L Shahsuvaryan, Professor, Department of Ophthalmology, Yerevan State Medical University, Yerevan, Armenia.

Received: December 13, 2022; **Published:** December 28, 2022

Glaucoma is the leading cause of untreatable blindness worldwide. Eleven percent of all global blindness in adults aged 50 years and older is caused by this disease [1,2].

Glaucoma represents a group of diseases associated with progressive loss of vision [3].

Besides well known open-angle and angle-closure types of glaucoma, it will be taken into account also lens related or lens-induced glaucoma, which can be subdivided into following categories: phacolytic glaucoma, lens particle glaucoma and phacoantigenic glaucoma. The first two will be not discussed in this paper. Currently Phacoantigenic, also known as phacoanaphylactic, glaucoma is uncommon type of lens-induced glaucoma and is often difficult to diagnose it *in vivo*. Taken into account the new findings on etiology excluding allergy or anaphylactic reaction, term "phacoanaphylaxis" became outdated. Phacoantigenic glaucoma is diagnosed in 5% of other types of lens induced glaucoma cases [4].

Sensitization to lens proteins after cataract extraction or trauma is inducing a granulomatous inflammation, which ends by phacoantigenic glaucoma [5].

After an eye surgery, as a complicated cataract surgery with vitreous loss, a mixture of lens material and vitreous may occur or due to other trauma to the lens capsule, resulting in retention and subsequent slow release of sensitizing lens proteins into the circulation. The individual's immune system recognized these proteins as 'alien' inducing an inflammatory response [6]. Phaco-antigenic glaucoma occurs in less than 1% of cataract surgeries, but it could also follow uncomplicated cataract extraction by phacoemulsification [7].

Manifestation of the immune response commonly takes a place within two weeks after surgery or trauma, although there may be a longer latent period after sensitization to lens proteins [8], initiating immune cascade reactions involving IgG and the complement system.

Diagnosis of phacoantigenic glaucoma is based on the presence of 2 criteria: 1. In the aqueous or vitreous specimen Polymorphonuclear (PMN) leukocytes must be detected. 2. Protein or particle of the circulating lens in the aqueous humor is inadequate to cause a glaucoma through outflow system obstruction.

The clinical signs of phacoantigenic glaucoma include conjunctival hyperemia from mild to severe, which accompany a drop in visual acuity (VA) compared to post-op VA. Slit lamp examination reveals mutton-fat keratic precipitates with low grade inflammation, often

with anterior/posterior synechiae, vitritis may also be present. Lens material in the anterior chamber angle may be visible with goniolens, but in the case of location in the sulcus or posteriorly to the iris ultrasound biomicroscopy (UBM) will be helpful. At initial presentation IOP may be decreased due to inflammation related suppression of aqueous humor production, commonly followed by increased IOP with corneal edema [6,8]. Remaining lens material identification and subsequent elimination commonly ends by positive outcome [9]. It was evidenced that the mixture of the lens material with vitreous predispose for prolongated lens proteins release [8].

Differential diagnosis

Detailed ocular history and biomicroscopy findings will be helpful for correct diagnosis. Special attention will be paid on detection of retained lens fragments after recent cataract surgery. Phacoantigenic glaucoma should be differentiated from phacolytic glaucoma, uveitic glaucoma and neovascular glaucoma.

Management

Medical therapy as an initial approach includes topical hypotensive and anti-inflammatory agents, specifically steroids, directed to lower IOP and control inflammation respectively. Surgical remove of the lens protein accelerates manageability, despite feasibility of success with topical therapy. Such miotics, as pilocarpine with proinflammatory effect, should not be prescribed to avoid posterior synechies. In contrast, use of such cycloplegics, as atropine is strongly recommended based on it's multiple mechanism of action: synechiolysis, supportive anti-inflammatory through ciliary muscle relaxation, or preventive for synechia formation simultaneously with topical hypotensive and anti-inflammatory therapy.

The surgical approach is directed to remove of all lens material remnants from anterior chamber (washout). In case of lens material localization into the anterior or posterior vitreous pars plana vitrectomy is indicated to remove lens particles entirely. Comprehensive initial examination of the patient should include also dilated fundoscopy with a special attention paid on the optic nerve appearance. It is worthy to note a role of visual field testing in diagnosing optic neuropathy and monitoring the patient.

In conclusion, the need for healthcare providers bearing in mind uncommon diseases to be familiar with the identification and treatment of phacoantigenic glaucoma is highlighted. Hopefully, discussed topic could allow people to be diagnosed and treated sooner.

Bibliography

1. GBD 2019 Blindness and Vision Impairment Collaborators, Vision Loss Expert Group of the Global Burden of Disease Study Steinmetz JD. "Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to vision 2020: the right to sight: an analysis for the global burden of disease study". *Lancet Global Health* 9 (2021): e144-160.
2. Sun Y., *et al*. "Time trends, associations and prevalence of blindness and vision loss due to glaucoma: an analysis of observational data from the Global Burden of Disease Study 2017". *BMJ Open* 12.1 (2022): e053805.
3. Gherghel D and De Moraes G. "Barriers to IOP-independent treatments in glaucoma clinical trials". *Eye* 18 (2022): 1-3.
4. Tyagi R., *et al*. "Clinical profile of lens induced glaucoma at a tertiary centre in north India". *Indian Journal of Clinical and Experimental Ophthalmology* 5.2 (2019): 169-175.
5. Razeghinejad R., *et al*. "Pathophysiology and management of glaucoma and ocular hypertension related to trauma". *Survey of Ophthalmology* 65.5 (2020): 530-547.
6. Papaconstantinou D., *et al*. "Lens-induced glaucoma in the elderly". *Clinical Interventions in Aging* 4 (2009): 331-336.

7. Chiu AKC and Mathews D. "Phaco-antigenic glaucoma following uncomplicated cataract surgery". *European Journal of Ophthalmology - SAGE Journals* 29.1 (2019): 22-26.

8. Conner IP., *et al*. "Lens-induced glaucoma". In: Kahook M., *et al*, eds. Chandler and Grant's Glaucoma, 5th edition. Thorofare, N.J.; Slack (2013): 441-447.

9. Shah SS and Meyer JJ. Lens Induced Glaucoma (2022).

Volume 14 Issue 1 January 2023