

THE EFFICACY OF GLAUCOMA TREATMENT AMONG UVEITIS PATIENTS AT  
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## ABSTRACT

**Aim:** to assess types of glaucoma and visual outcome of treatment in patients suffering from uveitis. **Method:** this prospective study was conducted at the glaucoma clinic in King Hussein Medical Center between June 2022 and August 2023. All uveitis patients who were found to have glaucoma were included in the study. Intra ocular pressure (IOP) measurement were performed using Goldmann applanation tonometry. Type of glaucoma and treatment options presented to the patients were identified and success of therapy and extent of glaucoma damage were assessed using automated Humphrey visual field and optical coherent tomography. Any type of surgical intervention if needed will be reported. Best corrected visual acuity using Snellen chart was evaluated as well. The obtained results were analyzed and compared with other studies. **Results:** 80 patients (100 eyes) with a mean age of  $44.3 \pm 12.3$  years were included in the study. 48 patients were males. the most common cause for uveitis was idiopathic in 48 eyes (48%) , the most common known cause was Behcet disease (18%) followed by juvenile idiopathic uveitis (12%) and ankylosing spondylitis. The most common site of inflammation was anterior (60%) followed by panuveitis (22%), intermediate uveitis (16%) and posterior uveitis (4%). 80% of the cases were chronic and 96% were noninfectious. Anti-glaucoma medication was the most commonly used to treat glaucoma in uveitis patients. Surgery was used in only 4 eyes (4%). **Conclusion:** Anterior uveitis, chronic uveitis and Behcet's disease were the most conditions encountered in glaucoma associated uveitis. Controlling both glaucoma and inflammation may greatly help in preserving vision and improve quality of life for patients with glaucoma associated uveitis.

**KEYWORDS:** Glaucoma, uveitis.

## INTRODUCTION

Uveitis, a heterogeneous group of inflammatory disorders affecting the eye. it poses a significant threat to vision due to the associated uveitis complications particularly glaucoma.<sup>[1]</sup> Glaucoma if not treated and controlled it can result in serious sequelae and optic nerve damage with subsequent deterioration of the visual field.<sup>[2]</sup> Early detection and proper management of both uveitis and glaucoma are mandatory for preserving visual function and enhancing the quality of life for affected individuals.<sup>[3]</sup>

The pathogenesis of uveitis-associated glaucoma involves a complex interplay between inflammatory cytokines, oxidative stress, and structural changes that may occur in the anterior and posterior segments of the eye.<sup>[4]</sup> Elevated intraocular pressure (IOP) may result from failure of proper drainage as a result of trabecular meshwork dysfunction, angle closure related to the presence of anterior or posterior synechiae, or corticosteroid-induced mechanisms can further

exacerbate optic nerve damage.<sup>[5]</sup> Diagnostic strategies for identifying glaucoma in uveitis patients rely on a combination of clinical assessments, including IOP measurement, visual field testing, optic nerve head evaluation, and imaging techniques such as optical coherence tomography.<sup>[6]</sup>

Management of glaucoma in uveitis is quite different from other forms of glaucoma, it necessitates a multidisciplinary approach involving ophthalmologists, rheumatologists, and other healthcare professionals.<sup>[7]</sup> Therapeutic interventions aim to control both intraocular inflammation and IOP which may be challenging in some cases. Although topical and systemic corticosteroids may contribute to IOP elevation. However, their use is essential to control the uveitis.<sup>[8]</sup> In addition, immunomodulatory agents, and biologic agents play pivotal roles in controlling uveitis-associated inflammation, thereby reducing the risk of glaucoma development.<sup>[9]</sup> Concurrently, IOP-lowering strategies encompass a spectrum of options, including topical

hypotensive medications, laser therapy, and surgical interventions like trabeculectomy or drainage implants.<sup>[5,8]</sup>

## METHODS

This prospective study was conducted at the glaucoma clinic in King Hussein Medical Center between June 2022 and August 2023. All uveitis patients who were found to have glaucoma were included in the study. Intra ocular pressure (IOP) measurement were performed using Goldmann applanation tonometry. Type of glaucoma and treatment options presented to the patients were identified and success of therapy and extent of glaucoma damage were assessed using automated Humphrey visual field and optical coherent tomography.

Any type of surgical intervention if needed will be reported. Best corrected visual acuity using Snellen chart was evaluated as well. The obtained results were analyzed and compared with other studies.

## RESULTS

80 patients (100 eyes) with a mean age of  $44.3 \pm 12.3$  years were included in the study. 48 patients were males. the most common cause for uveitis was idiopathic in 48 eyes (48%), the most common known cause was Behcet disease (18%) followed by juvenile idiopathic uveitis (12%) and ankylosing spondylitis 8%). The clinical etiologies for uveitis associated glaucoma are summarized in table 1.

**Table 1: The clinical etiologies for uveitis associated glaucoma.**

Etiology	Number of Eyes	Percentages
idiopathic	48	48%
Behcet disease	18	18%
juvenile idiopathic uveitis	12	12%
Ankylosing spondylitis	8	8%
Fuch's uveitis	6	6%
Herpetic uveitis	3	3%
others	5	5%

The most common site of inflammation was anterior (60%) followed by panuveitis (22%), intermediate uveitis (16%) and posterior uveitis (4%). 80% of the

cases were chronic and 96% were noninfectious. Table 2 describe the prevalence of glaucoma in relation to the site of the inflammation.

**Table 2: Uveitis associated glaucoma in relation to the site of the inflammation.**

Site of inflammation	Number of eyes	Percentages
Anterior uveitis	60	60%
Pan uveitis	22	22%
intermediate	16	16%
Posterior uveitis	4	4%

Anti-glaucoma medication were the most commonly used to treat glaucoma in uveitis patients. Surgery was used in only 4 eyes (4%).

**Table 3: Demonstrates Methods used To Treat Glaucoma Patients.**

Treatment option	Number	Percentages
Topical beta blockers	100	100%
Topical carbonic anhydrase inhibitors	82	82%
Alpha agonists	43	43%
Prostaglandin analogs	11	11%
Systemic carbonic anhydrase inhibitors	6	6%
Laser treatment	4	4%
surgery	4	4%

## DISCUSSION

The main age of the patients was 44.3 years. This age group is expected to be working age group and a lot of health and financial impacts may be associated with glaucoma and uveitis. Therefore, it is important to control Glaucoma and inflammation to improve the quality of life of affected individuals. Glaucoma is considered a common cause of blindness among young individuals. A lot of complications may occur in uveitis

patients which may result in visual loss like band keratopathy, cataract, optic nerve atrophy, macular hole, macular edema, macular scar, epiretinal membranes, retinal detachment, vitreous hemorrhage, and glaucoma. In this study, the most common underlying cause of glaucoma associated uveitis was idiopathic that's because the most common cause of uveitis was unknown. Behcet's disease was the most common known cause which is the mostly related to the high

prevalence of Behcet's disease in Jordan. In pediatric age group the most common etiology was juvenile idiopathic arthritis but not idiopathic. Although the rate of glaucoma was comparable among different uveitis conditions but Fuch's uveitis was an exception with higher incidence of glaucoma.

The most common site of inflammation which was associated with glaucoma was anterior uveitis. This is explained by the fact that anterior uveitis may result in anatomical changes in the anterior segment which may compromise the aqueous drainage. The presence of anterior or posterior synechiae may result in angle closure. Furthermore, topical steroids rather than systemic are usually the mainstay treatment for anterior uveitis which may contribute more to IOP elevation and more associated with steroid induced glaucoma. Panuveitis was the second contributor to glaucoma associated uveitis, and this was mainly due to the presence of anterior uveitis which was part of the pan uveitis.

Unlike other forms of glaucoma, topical betablockers and carbonic anhydrase inhibitors were the first line of management and were used in the vast majority of patients. Alpha agonists and prostaglandin analogs were not commonly used since they may induce inflammation by themselves. However, they were successfully used in individuals where unsatisfactory response is achieved with topical betablockers and carbonic anhydrase inhibitors. Systemic carbonic anhydrase inhibitors are used only when the patients are full topical anti glaucoma medications and being prepared for surgical intervention. Laser therapy was effectively used in few patients. Surgery was used in 4 patients and ahmed glaucoma valve (AGV) drainage device was the most commonly used. Trabeculectomy was not used because of the high failure rate to either excessive drainage or due to failure of drainage as a result of the high rate of post-operative adhesions and inflammations.

In conclusion glaucoma in uveitis presents a complex clinical scenario requiring comprehensive understanding of the underlying inflammatory mechanisms and ocular dynamics. Early detection and diligent management of both uveitis and glaucoma are paramount to preserving visual function and enhancing the quality of life for affected individuals.

The only limitation of this study is the presence of there factors which may affect the success rate of treatment like patient's adherence to treatment and the presence of other complications of uveitis and the unpredictable activity of uveitis which may occur during treatment.

## CONCLUSION

Anterior uveitis, chronic uveitis and Behcet's disease were the most conditions encountered in glaucoma associated uveitis. Controlling both glaucoma and inflammation may greatly help in preserving vision and

improve quality of life for patients with glaucoma associated uveitis.

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