SJIF Impact Factor: 6.711

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 9.
Issue: 10
Page N. 250-253
Year: 2025

Original Article

www.wjahr.com

THE PREVALENCE OF ELEVATE INTRAOCULAR PRESSURE IN PATIENTS WITH UVEITIS

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Article Received date: 10 August 2025 **Article Revised date:** 31 August 2025 **Article Accepted date:** 21 September 2025

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ABSTRACT

Background: Uveitis is a significant cause of ocular morbidity, often complicated by ocular hypertension (OHT) and secondary glaucoma. The relationship between intraocular pressure (IOP) elevation and intraocular inflammation is complex, influenced by disease chronicity, type of uveitis, and corticosteroid use. Identifying the prevalence and risk factors of OHT in uveitic patients is essential for early detection and management. **Aim:** To determine the prevalence of increased IOP among patients with uveitis and to identify the etiologies and clinical characteristics associated with OHT. **Patients and Methods:** This prospective case series was conducted at Ibn Al-Haitham Eye Teaching Hospital from August 2015 to June 2016. Seventy patients (131 eyes) with uveitis were included. Patients with exogenous uveitis, masquerade syndromes, lens-induced uveitis, or pre-existing primary glaucoma were excluded. All patients underwent complete ophthalmological examinations, including IOP measurement by applanation or air-puff tonometry, gonioscopy, and optic nerve evaluation. OHT was defined as IOP >21 mmHg on more than one occasion. Data were analyzed using SPSS version 20 with chi-square and paired t-tests. **Results:** OHT was observed in 45 out of 131 eyes (34%). Vogt-Koyanagi-Harada (VKH) disease was the most frequent cause, accounting for 22 of 40 eyes (55%). Other associations included juvenile rheumatoid arthritis (41.7%), Behçet's disease (30%), presumed tuberculous uveitis (25.8%), and pars planitis (17.8%). Female patients showed a slightly higher prevalence (45%) compared with males (33.3%). Ten eyes (22.2%) required surgical intervention when medical therapy failed. **Conclusion:** OHT is a common complication of uveitis, particularly in VKH, juvenile rheumatoid arthritis, and Behçet's disease. Early diagnosis and close monitoring are crucial to prevent progression to secondary glaucoma and irreversible vision loss.

KEYWORDS: Uveitis; Ocular hypertension; Intraocular pressure; Secondary glaucoma; Vogt-Koyanagi-Harada disease.

INTRODUCTION

Uveitis refers to a heterogeneous group of intraocular inflammatory disorders that represent an important cause of visual impairment and blindness worldwide. The prevalence of uveitis varies considerably by geographic region and clinical setting, accounting for approximately 10–15% of blindness in developed countries.[1] A major complication of uveitis is elevated intraocular pressure (IOP) or ocular hypertension (OHT), which may eventually lead to secondary glaucoma, a vision-threatening condition if not promptly diagnosed and treated.[2] The relationship between uveitis and IOP elevation is multifactorial. Acute inflammatory processes may obstruct aqueous humor outflow by clogging the trabecular meshwork with inflammatory cells or through trabeculitis, while chronic inflammation results in structural damage to the trabecular meshwork and synechial closure.[3] Additionally, corticosteroid therapy, which remains a cornerstone of uveitis management, is well known to induce IOP elevation in susceptible individuals.[4] Thus, both the disease itself and its treatment contribute to the risk of OHT and glaucomatous optic neuropathy. Several studies have reported that the prevalence of OHT in uveitic patients ranges from 18% to 42%, depending on the population studied, etiology, and referral setting.[5-7] Vogt–Koyanagi–Harada (VKH) disease, juvenile idiopathic arthritis (JIA), Behçet's disease, and infectious etiologies such as tuberculosis and toxoplasmosis have been identified as common causes of uveitis associated with

OHT.[8-10] Patients with chronic and recurrent uveitis are particularly at risk, as are those with prolonged corticosteroid use.[6-11] Although OHT does not always progress to secondary glaucoma, its presence warrants close monitoring, as glaucomatous optic nerve damage may develop silently and irreversibly.[12] The pattern and prevalence of OHT among uveitic patients in Iraq remain under-studied, despite the high burden of infectious and autoimmune uveitis in the region. Therefore, this study aimed to determine the prevalence of OHT among patients with uveitis attending Ibn Al-Haitham Eye Teaching Hospital and to identify the etiological subtypes most commonly associated with increased IOP. This information is essential for risk stratification, timely intervention, and prevention of irreversible visual loss in this patient population.

METHOD

This was a prospective case series study conducted at the uveitis clinic in Ibn Al-Haitham Eye Teaching Hospital, Baghdad, Iraq, between August 2015 and June 2016. The study population included all patients diagnosed with uveitis who were referred during the study period and subsequently developed increased intraocular pressure (IOP).

Inclusion and Exclusion Criteria.

Patients with endogenous uveitis of various etiologies were included. Exclusion criteria were.

- Exogenous uveitis (post-surgical or post-traumatic)
- Masquerade syndromes
- Lens-induced uveitis
- History of pre-existing primary open-angle glaucoma

Clinical Assessment

All patients underwent comprehensive ophthalmological evaluation including:

- Measurement of visual acuity.
- Slit-lamp biomicroscopy of the anterior segment.
- Dilated fundus examination using indirect ophthalmoscopy.
- Intraocular pressure (IOP) measurement by Goldman applanation or air-puff tonometry on more than one occasion.
- Gonioscopy to determine angle status (open or closed, synechial or appositional).
- Evaluation of optic nerve head with 90D or 78D stereoscopic lens to assess glaucomatous neuropathy.

DEFINITIONS

Ocular hypertension (OHT) was defined as IOP >21 mmHg on more than one visit. Cases were further classified according to anatomical type of uveitis (anterior, intermediate, posterior, panuveitis) based on the Standardization of Uveitis Nomenclature (SUN) criteria. Etiological diagnosis was established when possible, using internationally accepted diagnostic guidelines such as those for Vogt-Koyanagi-Harada (VKH) disease and Behçet's disease.

Ancillary Investigations

When the clinical picture was inconclusive, ancillary tests were performed, including complete blood count (CBC), ESR, chest X-ray, urinalysis, tuberculin skin test, and, when required, serological tests for syphilis, ultrasonography, fluorescein angiography, CT, or MRI.

Follow-up and Management

All patients were followed for at least three months. OHT cases received appropriate ocular hypotensive medications. In patients with glaucoma not controlled medically, surgical intervention (trabeculectomy with mitomycin C or Ahmed valve implantation) was performed.

Statistical Analysis

Data were analyzed using SPSS version 20. Results were summarized in tables. Statistical significance was tested with Chi-square or Fisher's exact test where appropriate, and paired t-test for continuous variables. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 70 patients (131 eyes) with uveitis were included. The mean age was 29.8 ± 16.2 years (range: 7–60 years). Most patients were female (57.1%) and had bilateral disease (61 patients). Acute uveitis was observed in 7.1%, while 92.9% had chronic uveitis. Ocular hypertension (OHT) was detected in 34.3% of uveitic eyes. This highlights that elevated IOP is a relatively frequent complication of uveitis as in table 1.

Table 1: Status of Intraocular Pressure in Uveitic Eyes.

IOP Status	No. of Eyes	%
Elevated	45	34.3
Normal	86	65.7
Total	131	100.0

The highest prevalence of OHT occurred in the 1–10 years (57.1%) and 11–20 years (44.8%) groups. Younger patients may be more prone to OHT in uveitis. As in table 2.

Table 2: OHT Distribution by Age Group.

Age Group (years)	No. of Eyes with Uveitis	Eyes with OHT (%)
1–10	21	12 (57.1)
11–20	29	13 (44.8)
21–30	25	6 (24.1)
31–40	23	6 (24.1)
41–50	22	7 (31.8)
51–60	11	1 (9.0)
Total	131	45

VKH was the leading etiology associated with OHT (55%). High rates were also observed in juvenile

rheumatoid arthritis, toxoplasmosis, and viral anterior uveitis. As in table 3.

Table 3: OHT Distribution by Etiology.

Etiology	No. of Eyes	Eyes with OHT (%)	p-value
Vogt–Koyanagi–Harada (VKH)	40	22 (55.0)	0.03
Presumed tuberculous uveitis	31	8 (25.8)	0.01
Pars planitis	28	5 (17.8)	0.02
Juvenile rheumatoid arthritis	12	5 (41.7)	0.04
Behçet's disease	10	3 (30.0)	0.04
Idiopathic anterior uveitis	5	0	0.0
Syphilitic uveitis	2	0	0.0
Toxoplasmosis	2	1 (50.0)	0.03
Viral anterior uveitis	1	1 (100)	0.001
Total	131	45	

Panuveitis was the most common anatomical type associated with OHT (38.6%). Anterior and posterior uveitis showed similar prevalence, while intermediate uveitis had the lowest. As in table 4.

Table 4: OHT Distribution by Anatomical Type of Uveitis.

Anatomical Type	No. of Eyes	Eyes with OHT (%)	p-value
Anterior	18	6 (33.3)	0.03
Intermediate	35	9 (25.7)	0.02
Posterior	3	1 (33.3)	0.01
Panuveitis	75	29 (38.6)	0.03
Total	131	45	

DISCUSSION

Elevated intraocular pressure (IOP) is one of the most common complications of uveitis and may progress to secondary glaucoma if not adequately controlled. In this study, ocular hypertension (OHT) was detected in 34% of uveitic eyes, which is comparable to other tertiary referral studies. Panek et al. reported a prevalence of 33% among uveitic patients in the UK, while Merayo-Lloves et al. observed similar figures in European cohorts.[13,14] This emphasizes that OHT remains a significant clinical burden in patients with intraocular inflammation. The distribution of OHT varied by etiology. Vogt–Koyanagi–Harada (VKH) disease was the most frequent cause, accounting for more than half of affected eyes. This aligns with findings from Veerappan et al., who described a strong relationship between VKH and secondary glaucoma.[15] Similarly, patients with juvenile idiopathic arthritis (JIA) had a high prevalence of OHT, in line with previous observations that JIA-associated uveitis carries a high risk of chronic inflammation and poor response to therapy.[16] Behçet's disease and presumed tuberculous uveitis were also notable contributors, consistent with earlier reports from endemic regions.[17] In terms of anatomical classification, OHT was more common in panuveitis, although anterior uveitis and posterior uveitis demonstrated comparable risks. Herbert et al. highlighted anterior uveitis as particularly predisposed to IOP elevation due to trabecular meshwork obstruction, but chronic panuveitis carries additional risks due to widespread inflammatory damage.[18] The relatively high frequency of glaucomatous optic neuropathy observed in this cohort underscores the need for early recognition and aggressive management. Management of OHT in uveitis remains challenging. In this study, most cases were controlled with topical ocular hypotensive therapy, though 22% required surgical intervention. Takahashi et al. reported similar findings, with around 12–15% of patients needing surgery.[19] Trabeculectomy with adjunctive antimetabolites and glaucoma drainage devices, such as Ahmed valves, remain viable options when maximal medical therapy fails.[20] The influence of corticosteroid therapy on OHT cannot be overlooked. Nearly all patients in this study had received steroids at some stage, consistent with the well-documented steroid-induced ocular hypertension described by Salam et al.[21] Differentiating disease-related OHT from steroid response is often difficult in practice but crucial for tailoring treatment.

CONCLUSION

The current study highlights that OHT in uveitis is multifactorial, influenced by etiology, anatomical subtype, chronicity, and treatment. Close monitoring and timely surgical referral when medical therapy fails are critical for preserving vision. Further studies with larger populations and longer follow-up are warranted to better define prognostic factors and optimize management strategies.

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