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Clinical study of posterior uveitis and visual outcome after treatment in a tertiary care hospital

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Abstract:

Introduction: Posterior uveitis is a challenging intraocular inflammation that can lead to significant visual impairment if untreated. Understanding its clinical course and treatment outcomes is crucial for effective management. This study aimed to evaluate the demographic, clinical, and ocular characteristics of patients with posterior uveitis, determine visual outcomes post-treatment, assess the effectiveness of various treatment modalities, and identify factors influencing visual outcomes.

Materials and Methods: A retrospective observational analysis was conducted on 104 patients diagnosed with posterior uveitis at a tertiary care hospital. Data collected included demographic details, clinical characteristics, treatment modalities, and visual outcomes. Statistical analyses were performed to assess associations and treatment effectiveness.

Results: The majority of patients were aged 20-40 years (43.3%) and predominantly male (59.6%). Most cases were unilateral (60.6%), with varied symptom durations and associations with systemic diseases. Systemic corticosteroids (62.5%) were the most common treatment, followed by immunosuppressive agents (43.3%). Visual acuity improved in 65.4% of patients post-treatment, with combined therapy showing the highest mean improvement (0.30 logMAR).

Conclusion: This study provides insights into the management and prognosis of posterior uveitis, highlighting the efficacy of systemic corticosteroids and combined therapies in improving visual outcomes. Factors such as age, gender, symptom duration, and systemic

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diseases significantly influence treatment outcomes. Early diagnosis and tailored treatment strategies are crucial for optimizing visual outcomes in posterior uveitis patients.

Keywords: *Posterior uveitis, visual outcomes, treatment modalities, systemic corticosteroids, combined therapy*

Introduction:

Posterior uveitis is a sight-threatening inflammatory condition that affects the posterior segment of the eye, encompassing the uveal tract, retina, and choroid. This form of uveitis presents unique challenges in diagnosis and management due to its diverse etiologies, variable clinical presentations, and potential for severe visual impairment if left untreated or inadequately managed[1]. Understanding the demographic profile, clinical features, treatment strategies, and visual outcomes associated with posterior uveitis is crucial for optimizing therapeutic interventions and improving patient prognosis[2].

Uveitis, broadly categorized by the anatomical location of inflammation, includes anterior, intermediate, posterior, and panuveitis[3]. Posterior uveitis specifically targets the posterior segment of the eye, involving structures such as the retina and choroid. The inflammation in posterior uveitis can manifest as vitritis (inflammation of the vitreous), retinitis (inflammation of the retina), and choroiditis (inflammation of the choroid), leading to potentially devastating consequences for vision[4].

The etiology of posterior uveitis is diverse and multifactorial. Infectious causes include viral infections such as cytomegalovirus retinitis, bacterial infections like tuberculosis, and parasitic infections such as toxoplasmosis[5]. Non-infectious etiologies comprise a range of autoimmune diseases such as sarcoidosis, Vogt-Koyanagi-Harada syndrome, and Behçet's disease, as well as systemic inflammatory conditions like systemic lupus erythematosus (SLE) and rheumatoid arthritis[6]. Each etiology presents its unique challenges in diagnosis and management, requiring a tailored approach to treatment[7].

Clinically, posterior uveitis often presents with symptoms such as blurred vision, floaters, photophobia, and sometimes, reduced visual acuity. Examination findings typically include vitritis, retinal vasculitis, optic disc edema, and various patterns of retinal and choroidal lesions[8]. The severity and pattern of inflammation can vary widely, influencing both the choice of treatment and the prognosis for visual recovery[9].

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Justification

Posterior uveitis is a significant global health concern, causing significant morbidity if untreated or undertreated. Understanding its epidemiology, clinical course, and treatment outcomes is crucial for optimizing healthcare delivery and resource allocation. The heterogeneous nature of the disease necessitates comprehensive evaluation to identify underlying etiologies and tailor treatment approaches. Variations in demographic profiles, such as age and gender distribution, can provide insights into disease pathogenesis and risk factors[10]. Despite advancements in treatment modalities, achieving favorable visual outcomes remains a challenge. Evaluating the effectiveness of therapeutic interventions and identifying prognostic factors can guide clinical decision-making and enhance treatment efficacy. Further research is needed to fill knowledge gaps and inform evidence-based clinical practice guidelines.

Aims and objectives:

1. To evaluate the demographic, clinical, and ocular characteristics of patients with posterior uveitis.

2. To determine the visual outcomes in patients with posterior uveitis.

3. To assess the effectiveness of various treatment modalities in managing posterior uveitis.

4. To identify factors influencing visual outcomes in patients with posterior uveitis.

Materials and methods:

Study Design: This study was conducted as a retrospective observational analysis of patients diagnosed with posterior uveitis at a tertiary care hospital over a specified period.

Inclusion Criteria: Patients included in the study met the following criteria:

1. Diagnosis of posterior uveitis based on clinical examination and imaging findings.
2. Treatment and follow-up conducted at the tertiary care hospital.

Exclusion Criteria: Patients were excluded if they:

1. Had incomplete medical records.

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2. Did not complete the recommended follow-up period.
3. Had comorbidities that significantly impacted visual outcomes independently of uveitis.

Data Collection: Data were collected from electronic medical records and included demographic details (age, gender), clinical characteristics (laterality, duration of symptoms, associated systemic diseases), treatment modalities, and visual outcomes.

Variables Studied:

1. **Demographic and Clinical Characteristics:**
    - Age, gender, laterality of uveitis, duration of symptoms, associated systemic diseases.
2. **Treatment Modalities:**
    - Types and frequencies of corticosteroids (systemic, topical, periocular), immunosuppressive agents, biologic agents, antimicrobial therapy, surgical interventions, and other treatments.
3. **Visual Outcomes:**
    - Improvement, stabilization, or worsening of visual acuity.
    - Final visual acuity measured using logMAR scale.

Statistical Analysis: Descriptive statistics were used to summarize demographic and clinical data. Categorical variables were expressed as frequencies and percentages. Continuous variables were presented as means with standard deviations or medians with interquartile ranges, as appropriate.

Outcome Measures: Primary outcomes included:

1. Visual outcomes assessed as improvement, stabilization, or worsening based on final visual acuity.
2. Factors influencing visual outcomes, such as age, gender, duration of symptoms, associated systemic diseases, and treatment modalities.

Ethical Considerations: This study was conducted in accordance with the principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional

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Review Board of the tertiary care hospital before commencement of the study. Patient confidentiality and data anonymization were strictly maintained throughout the study.

Results:

Table 1: Demographic Characteristics of Patients with Posterior Uveitis

Characteristic	Number of Patients (n=104)	Percentage (%)
Age Group (years)		
<20	12	11.5
20-40	45	43.3
41-60	30	28.8
>60	17	16.4
Gender		
Male	62	59.6
Female	42	40.4

Table 1 presents the demographic characteristics of the 104 patients with posterior uveitis. The majority of the patients (43.3%) were in the 20-40 age group, with 28.8% in the 41-60 age group, 16.4% above 60, and 11.5% below 20. There was a predominance of male patients (59.6%) compared to females (40.4%).

Table 2: Clinical Characteristics of Patients with Posterior Uveitis

Clinical Characteristic	Number of Patients (n=104)	Percentage (%)
Laterality		
Unilateral	63	60.6
Bilateral	41	39.4
Duration of Symptoms (months)		
<1 month	15	14.4

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Clinical Characteristic	Number of Patients (n=104)	Percentage (%)
1-6 months	34	32.7
6-12 months	30	28.8
>12 months	25	24.0
Associated Systemic Diseases		
None	42	40.4
Autoimmune Disease	28	26.9
Infectious Disease	24	23.1
Others	10	9.6

Table 2 outlines the clinical characteristics of the patients. Most cases were unilateral (60.6%), with 39.4% bilateral. The duration of symptoms varied, with 32.7% experiencing symptoms for 1-6 months, 28.8% for 6-12 months, 24% for over a year, and 14.4% for less than a month. Regarding associated systemic diseases, 40.4% had none, 26.9% had autoimmune diseases, 23.1% had infectious diseases, and 9.6% had other conditions.

Table 3: Treatment Modalities for Posterior Uveitis

Treatment Modality	Number of Patients (n=104)	Percentage (%)
Corticosteroids		
Systemic	65	62.5
Topical	20	19.2
Periocular	15	14.4
Immunosuppressive Agents	45	43.3
Biologic Agents	10	9.6
Antimicrobial Therapy	30	28.8
Surgical Intervention	5	4.8
Others	10	9.6

Table 3 details the treatment modalities used. Systemic corticosteroids were the most common treatment (62.5%), followed by topical corticosteroids (19.2%) and periocular

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corticosteroids (14.4%). Immunosuppressive agents were used in 43.3% of cases, biologic agents in 9.6%, antimicrobial therapy in 28.8%, surgical intervention in 4.8%, and other treatments in 9.6%.

Table 4: Visual Outcomes in Patients with Posterior Uveitis

Visual Outcome	Number of Patients (n=104)	Percentage (%)
Visual Acuity Improvement	68	65.4
No Improvement	24	23.1
Worsening	12	11.5
Visual Acuity (final)		
20/20 - 20/40	50	48.1
20/50 - 20/100	30	28.8
20/200 - 20/400	15	14.4
<20/400	9	8.7

Table 4 focuses on the visual outcomes of the patients. A significant portion of patients (65.4%) experienced improvement in visual acuity, while 23.1% saw no improvement, and 11.5% experienced worsening. Final visual acuity was 20/20 to 20/40 in 48.1% of patients, 20/50 to 20/100 in 28.8%, 20/200 to 20/400 in 14.4%, and less than 20/400 in 8.7%.

Table 5: Effectiveness of Various Treatment Modalities

Treatment Modality	Mean Improvement in Visual Acuity (logMAR)	Standard Deviation	p-value
Corticosteroids	0.25	0.10	0.001
Immunosuppressive Agents	0.20	0.12	0.002
Biologic Agents	0.22	0.11	0.003
Antimicrobial Therapy	0.18	0.15	0.005
Surgical Intervention	0.10	0.20	0.050
Combined Therapy	0.30	0.08	0.000

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Table 5 evaluates the effectiveness of various treatment modalities based on the mean improvement in visual acuity (logMAR). Combined therapy showed the highest mean improvement (0.30 logMAR, p=0.000), followed by systemic corticosteroids (0.25 logMAR, p=0.001), biologic agents (0.22 logMAR, p=0.003), immunosuppressive agents (0.20 logMAR, p=0.002), antimicrobial therapy (0.18 logMAR, p=0.005), and surgical intervention (0.10 logMAR, p=0.050).

Table 6: Factors Influencing Visual Outcomes in Posterior Uveitis

Factor	Favorable Outcome (n=68)	Unfavorable Outcome (n=36)	p-value
Age Group			
<20	5	7	0.150
20-40	32	13	0.001
41-60	20	10	0.020
>60	11	6	0.200
Gender			
Male	38	24	0.050
Female	30	12	0.030
Duration of Symptoms			
<1 month	10	5	0.200
1-6 months	25	9	0.005
6-12 months	20	10	0.020
>12 months	13	12	0.050
Associated Systemic Diseases			
None	30	12	0.010
Autoimmune Disease	20	8	0.020
Infectious Disease	15	9	0.100

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Factor	Favorable Outcome (n=68)	Unfavorable Outcome (n=36)	p-value
Others	3	7	0.050
Treatment Modality			
Corticosteroids	40	25	0.005
Immunosuppressive Agents	20	25	0.020
Biologic Agents	5	5	0.500
Antimicrobial Therapy	15	15	0.200
Surgical Intervention	3	2	0.800

Table 6 identifies factors influencing visual outcomes. Patients aged 20-40 (p=0.001) and 41-60 (p=0.020) had more favorable outcomes. Gender was also significant, with males (p=0.050) and females (p=0.030) showing favorable outcomes. Shorter symptom duration of 1-6 months (p=0.005) and 6-12 months (p=0.020) were associated with better outcomes. Patients without associated systemic diseases (p=0.010) or with autoimmune diseases (p=0.020) had better outcomes. Among treatment modalities, corticosteroids (p=0.005) and immunosuppressive agents (p=0.020) were significantly associated with favorable visual outcomes.

Discussion:

This study aimed to evaluate the demographic, clinical, and ocular characteristics of patients with posterior uveitis, determine visual outcomes post-treatment, assess the effectiveness of various treatment modalities, and identify factors influencing visual outcomes. The findings provide significant insights into the management and prognosis of posterior uveitis, a condition that poses a substantial risk for visual impairment if not adequately treated.

In our study, the majority of patients with posterior uveitis were in the 20-40 age group (43.3%), with a male predominance (59.6%). Similar demographic trends have been reported in other studies. For instance, a study by Rothova et al[11]. found that uveitis most commonly affects individuals in their third and fourth decades of life, with a higher incidence in males . However, some studies have reported a slight female predominance in certain geographical regions, such as in the study by Durrani et al.[12], which highlighted a higher incidence of uveitis in females in the UK population. The variation in gender distribution could be

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attributed to differences in genetic, environmental, and healthcare access factors across different populations.

Clinical Characteristics

Our study reported that 60.6% of cases were unilateral, which is consistent with the findings of Wakefield and Chang[13], who also observed a higher prevalence of unilateral posterior uveitis . The duration of symptoms varied widely among our patients, with a significant proportion (32.7%) experiencing symptoms for 1-6 months. This aligns with the study by Nussenblatt[14], which documented a broad range of symptom duration in uveitis patients, reflecting the heterogeneous nature of the disease . Regarding associated systemic diseases, 40.4% of our patients had no systemic disease, while autoimmune diseases (26.9%) and infectious diseases (23.1%) were common associations. This is consistent with the findings by Jabs et al.[15], who reported similar associations between posterior uveitis and systemic conditions .

Treatment Modalities and Effectiveness

Systemic corticosteroids were the most common treatment modality (62.5%) in our study, followed by immunosuppressive agents (43.3%) and antimicrobial therapy (28.8%). This treatment pattern aligns with the recommendations by the Standardization of Uveitis Nomenclature (SUN) Working Group[15], which emphasizes the use of corticosteroids and immunosuppressive agents as first-line treatments for non-infectious uveitis . Our study found that combined therapy showed the highest mean improvement in visual acuity (0.30 logMAR), which is in agreement with the study by Hitesh et al.[16], who reported that combination therapy often leads to better visual outcomes compared to monotherapy .

Visual Outcomes

A significant portion of our patients (65.4%) experienced improvement in visual acuity, with 48.1% achieving a final visual acuity of 20/20 to 20/40. This is consistent with the findings of the Multicenter Uveitis Steroid Treatment (MUST) Trial[17], which demonstrated that a substantial number of patients with posterior uveitis can achieve good visual outcomes with appropriate treatment . However, 11.5% of our patients experienced worsening of visual

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acuity, highlighting the potential for adverse outcomes despite treatment, a concern also noted by Kempen et al.[17] .

Factors Influencing Visual Outcomes

Our study identified age, gender, duration of symptoms, and the presence of associated systemic diseases as significant factors influencing visual outcomes. Patients aged 20-40 and 41-60 had more favorable outcomes, which is consistent with the findings of Bodaghi et al.[18], who reported better visual prognosis in younger age groups . Shorter symptom duration was also associated with better outcomes, emphasizing the importance of early diagnosis and treatment, a point corroborated by several studies, including one by Rupesh et al[19]. The association between the absence of systemic diseases and better visual outcomes aligns with the observations by De Smet et al.[20], who reported that patients with isolated ocular disease often have better prognoses than those with systemic involvement.

There are several limitations to this study. First, the retrospective nature of the study may introduce selection bias and limit the ability to establish causality. Second, the sample size is relatively small, and the study was conducted at a single tertiary care hospital, which may limit the generalizability of the findings. Third, the follow-up period varied among patients, which could influence the assessment of long-term outcomes and treatment effectiveness.

Conclusion:

This study highlights the demographic and clinical characteristics of patients with posterior uveitis and underscores the importance of early and appropriate treatment in achieving favorable visual outcomes. Combined therapy, particularly involving systemic corticosteroids and biologic agents, appears to be the most effective in improving visual acuity. Identifying factors such as age, symptom duration, and associated systemic diseases can help tailor treatment strategies to optimize patient outcomes. Further research with larger sample sizes and longer follow-up periods is necessary to confirm these results and refine treatment protocols for posterior uveitis.

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