

**ETIOLOGY AND CLINICAL SPECTRUM OF ANTERIOR UVEITIS IN A TERTIARY EYE CARE HOSPITAL FROM EASTERN INDIA: A PROSPECTIVE INTERVENTIONAL STUDY****ANITA MISRA, PRANATI CHAUDHURY, SUBHRAJYOTI MOHANTY, SASMITA SAHOO,  
BICHISMITA JENA, KALPANA BADWAL\***

Department of Ophthalmology, SCB Medical College and Hospital, Cuttack, Odisha, India. Email: anitmisra@gmail.com

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**ABSTRACT**

**Objective:** The objective is to study the etiology, clinical spectrum, management, and outcome of anterior uveitis in a tertiary eye care center in Eastern India and compares it with the data of other published reports.

**Methods:** This study was a prospective interventional clinical research performed on all (new and old) anterior uveitis patients visiting our ophthalmology OPD for treatment between January 2020 and December 2022. A thorough history, clinical examination, and investigation procedures were performed to diagnose the exact etiology and clinical characteristics of anterior uveitis. After treatment, cases were followed up for 6 months.

**Results:** Total cases of uveitis seen were 286, out of which anterior uveitis was the most common category with 150 cases (52%) which constituted the study population. Male patients were 71% whereas females were 29%. 61% of cases were in the age group of 20–40 years. 60% of cases were acute, 27% in chronic, whereas 13% were in the recurrent anterior uveitis stage. It was unilateral in 74% of cases. 72% of the cases were clinically non-granulomatous type. Idiopathic etiology was significantly seen in 62% of cases. For identifiable diseases, infectious cause was (16%), non-infectious (12%), and traumatic cause (10%). Infections of which the chief cause were tuberculosis (10%), viral (04%), and leprosy (02%), while in the non-infectious category of uveitis spondyloarthropathy (08%), lens-induced uveitis (04%) were the most common etiology. Before treatment vision in 15% of cases was 6/12 or better, which improved after treatment to 6/12 or better in 62% of cases. 34% of the patients had no residual complications after treatment, whereas the most common complication was persistent posterior synechia in 23% and cataract in 16% of cases.

**Conclusion:** The cause in majority of the cases of anterior uveitis remained idiopathic. However, prompt diagnosis appropriate and adequate treatment, and follow-up could restore good vision without significant symptoms, sequelae, or ocular morbidity in majority of cases.

**Keywords:** Etiology, Idiopathic, Spectrum, Tuberculosis, Anterior uveitis, Visual outcome.

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**INTRODUCTION**

Uveitis is a vision-threatening intraocular inflammation that has varied etiology and presentation. This may lead to permanent visual disability when appropriate and adequate treatment is not given in the initial stages of affection. Due to ocular inflammation, 5–20% of population suffers from legal blindness in developed countries and up to 25% in the developing world [1]. In the United States of America, there are approximately 14–17 cases/lakh population and 38,000 newly diagnosed patients of ocular inflammation every year among all ages [2]. In India, overall incidence differs regionally with a predictable occurrence of nearly about 730 cases/lakh [3].

The important diagnostic signs are present in the clinical spectrum and the success of treatment depends on prompt diagnosis and timely treatment schedule [4]. Anterior uveitis is the most common category with a variable prevalence throughout the world and is divided into iritis, anterior cyclitis, and iridocyclitis, based on the Standardization of Uveitis Nomenclature (SUN) Standards [3-5]. This exists in acute, subacute, or chronic stages [6]. Anterior uveitis is the ocular inflammation that most ophthalmologists encounter regularly and it was observed to be around 3–5 cases daily, accounting for 2% of our daily ophthalmology outpatient appointments. This study delivers perceptions of the etiology, magnitude, and profile of anterior uveitis throughout different age categories [7,8].

**Aim and objective**

To study the etiology, clinical spectrum, and treatment outcome of anterior uveitis in a tertiary eye care center in Eastern India and review the data of other published reports.

**METHODS**

This study was a prospective interventional hospital-based clinical research with 150 cases aged between 20 and 80 years, visiting our OPD in the Department of Ophthalmology and RIO, SCB Medical College, and Hospital, over a period of 2 years from January 2020 to December 2022, with signs and symptoms of anterior uveitis. The enrolment period was first 18 months and follow-up for the next 6 months. Required clearance from the Institutional Ethical Committee was obtained, and informed consent has been collected from all patients. Declaration of Helsinki was followed.

**Inclusion criteria**

Persons, clinically established as having anterior uveitis within 12 months' study period were enrolled in the study.

**Exclusion criteria**

These cases have been entirely exempted from the study plan as follows:

1. Anterior uveitis associated with infective corneal ulcer,
2. Recent intraocular surgery,
3. Spillover or additional-uveitis namely intermediate, posterior or panuveitis
4. Recurrent anterior uveitis untreated for >3 months
5. Masquerade syndromes.

A detailed history has been collected from all cases. Demographic statistics comprising age, sex, and laterality were observed among the cases. Thorough ophthalmological examinations were performed including visual acuity, slit-lamp inspection, applanation tonometry, and in-direct ophthalmoscopy. The onset, duration, course, and anatomic

location of the inflammation classification were based on the SUN Standards. Customized examinations were performed in every patient to establish etiology and categorization comprising anterior segment optical coherence tomography, and B scan USG in opaque media where necessary.

The investigations were ordered keeping in mind the diagnosis and probable differential analysis in every case and comprised of total blood count, ESR, C-reactive protein, rheumatoid factor, anti-nuclear antibody, HLA B27 by qualitative PCR, ELISA for Herpes, serum viral antibody, Quantiferon Tb gold, chest X-ray, CT thorax, CT and X-rays of the sacroiliac joint and lumbosacral spine, aqueous tap. Whichever cases required special consultation with other clinical specialists was referred accordingly. The final etiological diagnosis was made based on clinical features, laboratory investigations, and systemic evaluation. In cases where the specific etiology could not be identified, the term "idiopathic uveitis" was addressed.

In all cases, precise management was commenced when specified, complemented by anti-inflammatory treatment as proper. Follow-up after initial treatment was after 1 week, then 2-3 weekly for 3 months, and at 6 months.

### Statistical analysis

Statistical analysis was performed by SPSS software. Interpretation has been done through precise statistical assessments to find out the statistical significance.  $p < 0.05$  were found to be statistically significant.

### RESULTS

The total cases of uveitis were 286, out of which anterior uveitis cases were 150 cases (52%).

Table 1 describes socio-demographic features. The age range was taken between 20 and 80 years, however, 61% of cases were found to be younger, age ranging between 20 and 40 years. 29% of patients were from the age group of 41-60 whereas 10% belonging to the age group of 61-80. 71% of cases were male whereas 29% were female. Most cases (74%) presented with uniocular affection.

Table 2 shows that majority of the cases were grouped under non-granulomatous (72%) and the remaining 28% were grouped under the granulomatous inflammation category.

Table 3 represents the duration of the clinical presentation. About 60% of the cases fall under acute disease, 27% under chronic disease, 13% re-current anterior uveitis.

Table 4 depicts the job-related distribution among the study group. Most patients were found to be laborers, officials, and homemakers accounted for nearly equivalent cases.

**Table 1: Socio-demographic Features of anterior uveitis**

Age (in years)	Frequency n=150 (%)
20-40	81 (61)
41-60	49 (29)
61-80	20 (10)
Sex	
Male	105 (71)
Female	45 (29)
Laterality	
Uni-lateral	112 (74)
Bi-lateral	38 (26)

**Table 2: Types of inflammation (pathology) among the patients**

Types of inflammation	Frequency n=150 (%)
Non-granulomatous	108 (72)
Granulomatous	42 (28)

Table 5 shows the distribution of etiological factors. Results observed were unidentifiable "Idiopathic" in a significant number of (62%) cases. For identifiable diseases, infectious cause was (16%), non-infectious cause (12%), and traumatic cause (10%). Infections of which tuberculosis in 10%, viral in (04%), leprosy in 02% cases were the chief cause, while in the non-infectious category spondyloarthropathy (08%), lens-induced uveitis (04%) were the most common cause.

Table 6 compares the visual outcome among the study population at the time of presentation and 6 months after the institution of treatment. It was observed that approximately 55% of the cases showed visual acuity of 6/60 or less at the time of presentation whereas only 4% of cases had vision worse than 6/60 post-treatment. It was also seen that 15% of the cases had vision 6/12 or better before treatment whereas post-treatment vision improvement was 6/12 or better among 62% of the cases.

Table 7 shows complications after treatment and 6 months' follow-up. Approximately 34% of the cases showed no sequelae. Of the 66% of cases which showed residual signs, the chief complication was persistent posterior synechiae in 23% followed by secondary/senile cataract (16%).

**Table 3: Clinical presentation of patients**

Clinical presentation	Frequency n=150 (%)
Acute	90 (60)
Chronic	41 (27)
Re-current	19 (13)

**Table 4: Distribution of occupation among patients**

Occupation	Frequency n=150 (%)
Labourer	58 (48)
Officials	32 (22)
Homemakers	30 (20)
Business	16 (6)
Student	14 (4)

**Table 5: Etiological factors of uveitis**

Etiological factors	Frequency (%)
Idiopathic causes	62
Infective uveitis	
Tuberculosis	10
Viral etiology	04
Leprosy	02
Non-infective group	
Spondyloarthropathy	08
Lens-induced uveitis	04
Traumatic cause	10

**Table 6: Visual acuity at presentation (pre-treatment) and post-treatment after 6 months**

Visual acuity	(%)	
	Pre-treatment (presentation)	Post-treatment (6 months)
PL PR + to <3/60	11	-
3/60 to <6/60	21	-
6/60	23	04
6/36	18	11
6/24	07	14
6/18	05	09
6/12	09	11
6/9	05	25
6/6	01	26

**Table 7: Complications of anterior uveitis (3 months' post-treatment)**

Complications of anterior uveitis	Frequency n=150 (%)
No complication	52 (34)
Post. synechiae	35 (23)
Secondary/senile cataract	25 (16)
Secondary glaucoma	23 (15)
Iris atrophy	11 (09)
Cystoid macular edema	04 (03)

Secondary glaucoma was observed among (15%) while Iris Atrophy among (09%) and cystoid macular edema in 3% of the study population.

## DISCUSSION

Total cases of uveitis were 286, out of which anterior uveitis cases were 150 (52%). This study revealed that 61% of cases were among 20–40 years of age whereas only 10% of cases were above 60 years. This observation seems to be comparable with the results documented in few studies [9,10]. This is postulated to be due to reduced antigenicity in the elderly population but in contradiction, phacolytic cause was found to be the main cause of anterior uveitis in elderly. Idiopathic anterior uveitis was observed to be the most common etiology in all age groups [9-11].

Male patients dominated the study accounting for 71% whereas female cases were found to be 29%. Similar male preponderance is comparable to interpretations made by Rathinam and Namperumalsamy [9,11] whereas a dissimilar effect of female preponderance was observed in the study done by Rodriguez *et al.* [12] This observation in our study may be because males are more exposed to outdoor activities and undertake significantly more hospital visits than females. Occupation distribution of cases showed that 58% were laborers.

The distribution of etiological factors was studied and the results observed were not identifiable (Idiopathic) insignificant (62%) cases. For identifiable diseases, the infectious cause was (16%), the non-infective category of uveitis (12%), and traumatic cause (10%). Infectious causes of which tuberculosis (10%), viral etiology (04%), and leprosy (02%) were the chief cause, while in the Non-infective category of uveitis spondyloarthropathy (08%), lens-induced uveitis (04%) were the most common type. In a study by Singh R on anterior uveitis, a specific diagnosis could be established in 38.7% of patients where the most common specific diagnosis for anterior uveitis was ankylosing spondylitis in 13.2% followed by tuberculosis in 7.9% of patients [10]. Comparable data were published in studies by Jain *et al.* [16] and Jarwal [17] from other parts of India.

The unilateral presentation was seen in 74%. This observation was analogous to report documented by Rathinam and Namperumalsamy [9,11] where unilateral presentation was revealed as 85%. Chief presentation according to onset in our study - 60% of the cases were acute, 27% chronic and 13% showed re-current uveitis. Rathinam and Namperumalsamy [9,11] documented 71% acute, 24% chronic, and 3% as recurrent.

Non-granulomatous inflammation was observed among the majority of cases (72%) and granulomatous in (28%). This seems to be comparable to other studies [9,13]. Research done by Özdal *et al.* also showed similar observations for the causes of inflammations which is similar to our study [11]. Similar observations were also documented by other studies which were found to be comparable with the present study with 75% of acute uveitis and 17% of chronic uveitis [14,15]. Among 42 cases of granulomatous inflammations, 22 had acute, 18 cases had chronic and 2 patients had recurrent presentation.

For all the cases in our study, proper treatment plan, clinical management, and follow-up were done after initial treatment after 1 week, then 2–3 weekly for 3 months and at 6 months.

Complications were mostly observed among chronic and recurrent cases. Persistent posterior synechiae (23%) was the most observed complication followed by cataracts (16%). Secondary glaucoma was observed among (15%), Iris Atrophy was seen in 09% and cystoid macular edema in 03%. This is comparable to the study by Kumaraswamy and Madhavi [13]. This observation is comparable with the study reported by Rothova *et al.*, which documented 19% cataract and 11% glaucoma [14]. After the proper clinical management of uveitis, vision in 62% of cases improved to 6/12 or better against 15% in pretreatment cases. The observations of systemic comorbidity associated with uveitis in current research revealed that uveitis is mainly related to diabetes in 21 cases (14%) observed to be in the age category of more than 48 years. This report is further confirmed by studies documenting that diabetes might probably be the major risk factor for the progression of uveitis in the elderly.

## Limitation

This was a hospital OPD-based study and does not represent the population. Furthermore, the study duration and sample size were less, and no long-term follow-up was conducted. In majority of cases, etiology could not be established and treatment was given empirically.

## CONCLUSION

Despite exhaustive efforts to establish the etiology, majority of the cases of anterior uveitis remained idiopathic. This signifies our poor understanding, lack of sensitivity, and specificity of investigative procedures for anterior uveitis. However, prompt diagnosis irrespective of cause, appropriate and adequate treatment and follow-up could restore good vision without significant symptoms or sequelae in majority of cases. Ocular morbidity was more common in chronic and recurrent cases.

## AUTHORSHIP CONTRIBUTIONS

Dr. Anita Misra and Dr. Pranati Chaudhury - Design and data collection or processing, editing the manuscript. Dr. Anita Misra, Dr. Pranati Chaudhury, Dr. Subhrajyoti Mohanty, Dr. Sasmita Sahoo, Dr. Bichismita Jena, \*Kalpana Badwal - Analysis or interpretation, literature search, manuscript writing and submission.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

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