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Pattern of uveitis: A study at regional eye hospital

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Abstract
Aim & Objectives: To study the pattern of uveitis and common causes of uveitis in our region.
Methodology: In the present study, 100 patients with uveitis, attending Regional Eye Hospital, Warangal were included. The average age of presentation these patients was around 40 years with no significant gender preponderance. All patients underwent a through systemic and ocular examination. A tailored laboratory investigation was done in each case to facilitate diagnosis.
Results: Most common type of uveitis in our study was anterior uveitis which was chronic and non-infectious in nature. Diagnosis was made with respect to the type and etiology of uveitis. Etiology remained undetermined in majority of cases. Most common cause in present study was Tuberculosis and Rheumatoid arthritis. Most common complications were macular oedema and raised intraocular pressure. Majority of patients responded well to treatment.
Conclusion: The most common specific etiology was tuberculosis; however most of the cases were idiopathic. There was no significant sex predisposition seen.

Keywords: Uveities, intraocular pressure, oedema, rheumatoid arthritis

Introduction

The term *uveitis*, derived from *uva*, the Latin word for grape, encompasses a broad range of disease processes involving the uveal tract (i.e. the iris, ciliary body, and choroid) and its associated ocular structures including the retina, optic nerve and vitreous. It may also be a part of systemic inflammatory disease.

The etiology is difficult to establish since the exact cause of uveitis frequently remains unknown. Therefore the current International Uveitis Study Group classification system is based on the anatomical location of the inflammation: anterior uveitis (iris and ciliary body), posterior uveitis (choroid and retina), intermediate uveitis (peripheral retina and pars plana of the ciliary body), and panuveitis (generalized inflammation of the whole uvea) [1].

Causes of uveitis are known to vary in different populations depending upon the ecological, racial and socioeconomic variations of the populations studied. The cause of inflammation might be infections agent or trauma, but in most cases it the underlying mechanism appears to be autoimmune in nature.

Tropical countries are unique in their climate, prevailing pathogens and existing diseases, which further influence the epidemiological and geographical distribution of specific entities. Awareness of such regional differences in the disease pattern is essential in deriving a region-specific list of differential diagnosis which in turn facilitates the final diagnosis [2].

The annual incidence of uveitis is estimated between 17 and 52 per 100 000 person-years with a prevalence of 38-714 cases per 100000 persons [3-5]. The incidence of uveitis in India as reported by the various hospital based studies ranges from 0.8-1.8% of all new ophthalmic patients [2, 6]. In order to enhance understanding and management of ocular inflammation International ocular Inflammation Society (IOIS) has been founded [7].

Deleterious effects on vision, either by acute ocular inflammation or by its sequelae, such as cataracts, glaucoma and retina vascular ischemia, make uveitis one of the major causes of visual loss [8].

Uveitis may occur in any age group, but most commonly seen in the 30 to 39 year old age group. It is less common in children below 10 years and in patients over 60 years [6].

We performed this study in a tertiary eye center in rural region, South India with the objective of determining the pattern and causes of uveitis, the associated systemic conditions and to compare this pattern seen elsewhere in the world. This study will facilitate in deriving a region specific list of differential diagnosis which in turn will help in taking preventive steps towards visual complications.

AIM and Objectives

The aim of our study is two-fold.

- To study the pattern of uveitis in our region and compare it with the other regions.
- To identify common causes of uveitis in our region.

Materials and Methods

Source of data: A total of 100 patients of uveitis were studied, source being routine OPD patient presenting to the Regional eye hospital between the period from October 2017 upto September 2019 after their informed consent.

Inclusion Criteria

All patients with uveitis.

Exclusion criteria

1. Cases of Endophthalmitis and Panophthalmitis.
2. Cases of Eale's disease.
3. Cases having glaucoma with uveitis.
4. Cases of traumatic and post-operative uveitis.

Evaluation

A standard clinical proforma was filled in all cases for analytical study which included salient points in symptoms, history, clinical findings and anticillary testing. Ophthalmic examination included:-

1. Visual acuity testing for distance and near using Snellen's distant chart and near vision chart respectively.
2. External ocular examination.
3. Slit lamp biomicroscopic examination for evidence of the following findings.
4. Morphological alterations of the cornea, corneal transparency and oedema, evidence of Keratic precipitates.
5. Anterior chamber depth and pigment dispersion in the anterior chamber.
6. Aqueous flare and cells
7. Presence of posterior synechiae.
8. Iris colour and pattern, nodules, atrophic patches.
9. Pupillary size and shape; reactions.
10. Lens transparency, complicated cataract.
11. Tonometry using Applanation tonometer.
12. Gonioscopy with Goldmann three mirror lens, to evaluate the angle of anterior chamber, which was graded as follows

Table 1: Shaffer's grading of angle width

Grade	Angle width	Configuration	Chance of closure	Structure visible on Gonioscopy
4	35-45	Wide open	Nil	From Schwalbe's line to cilliary body
3	20-35	Open	Nil	From Schwalbe's line to sclera spur
2	20	Moderately Narrow	Possible	From Schwalbe's line to Trabecular meshwork
1	10	Very narrow	High	Schwalbe's line only
0	0	Closed	Closed	None of the structures visible.

5. The pupils were then dilated with a combination of 5% phenylephrine and tropicamide 0.8% drop was instilled every 5 minutes for 15 minutes interval.
6. This was followed by slit lamp examination for
   - Measuring pupil size, evidence of festooned pupil.
   - Posterior segment evaluation with +90D lens
7. Ophthalmoscopy: direct and indirect.

An anatomical diagnosis was made in all the cases according to International Uveitis Study Group System as having anterior uveitis, posterior uveitis, intermediate uveitis, or panuveitis.

The final diagnosis was based on chronological history, clinical manifestations and the result of the laboratory investigations systemic evaluation by other medical specialities. The term idiopathic uveitis was used whenever the intraocular inflammation could not be attributed to an underlying systemic disease or specific ocular entity.

After the diagnostic procedures were completed, the patients were classified as having infectious uveitis, uveitis associated with noninfectious systemic diseases, specific ocular entities, or idiopathic uveitis.

Results

In the present study 100 patients aged 10-80 yrs of both sexes were studied and following observations were made. The mean age at onset of uveitis was 40.3 years in males and 38.7 years in females. In all, 56 patients (56%) were between the ages of 20 and 50 years. In total, 2 (2%) of our patients were younger than 18 years and 20 (20%) were aged 60 years and more. No significant gender predominance was found (male–female ratio, 1: 1.7). This is shown in following tables.

Table 2: Age distribution

Age (yrs)	Frequency	Percentage (%)
10-19	6	6
20-29	19	19
30-39	14	14
40-49	23	23
50-59	18	18
60-69	17	17
70-79	3	3

Table 3: Sex distribution

Sex	Number	Percentage (%)
Male	38	38
Female	62	62

Table 4: Laterality

Age (yrs)	Number	Percentage (%)
Unilateral	82	82
Bilateral	18	18
Total	100	100

In this study unilateral involvement was more common compared to bilateral. Uveitis was unilateral in 82 patients (82%) and bilateral in 18 patients (8%).

Table 5: Clinical presentation

Presentation	Number	Percentage (%)
Acute	33	33
Chronic	67	67
Total	100	100

In our study it was observed that most common presentation was chronic in 67 patients (67%).

Table 6: Type of inflammation

Type	Number	Percentage (%)
Nongranulomatous	65	65
Granulomatous	35	35
Total	100	100

In our study No granulomatous uveitis (65%) occurred more frequently than granulomatous uveitis (35%). In granulomatous inflammation clinical presentation was chronic in most of the patients. Granulomatous type inflammation was observed in patients of tuberculosis, herpes zoster and idiopathic anterior uveitis.

Table 7: Etiological types

Type	Number	Percentage (%)
Non infectious	76	76
Infectious	24	24
Total	100	100

Majority of the cases in our study were found out to be non-infectious in etiology (76%). Of the 12 patients suspected to have infectious etiology, tuberculosis was the commonest infection (14 patients; 58.3%); followed by Herpes zoster (4 patients, 16.7%); Syphilis (1 patient, 4.2%), Leprosy (2 patients, 8.3%) and HIV retinopathy (3 patient 12.5%).

Table 8: Anatomical pattern of uveitis

Type	Number	Percentage (%)
Anterior Uveitis	51	51
Intermediate Uveitis	6	6
Posterior Uveitis	35	35
Panuveitis	8	8

Anterior uveitis was the most frequent form accounting for (51%) of all patients, followed by posterior uveitis (35%), panuveitis (8%) and intermediate uveitis (6%). There was a significant predominance of bilateral disease among patients with panuveitis. Chronic presentation was predominant in patients with panuveitis (100%) and posterior uveitis (68.6%).

Table 9: Etiological distribution

Etiology	Number	Percentage (%)
Tuberculosis	14	14
Rheumatoid Arthritis	14	14
Pars Planitis	6	6
Herpes zoster	4	4
Ankylosing Spondylitis	3	3
JRA	1	1
Syphilis	1	1
AIDS	3	3
Leprosy	2	2
Idiopathic	52	52

Out of 100 patients, 48 patients (48%) had a specific etiology. Of the 48 patients with specific etiology, 24 (50%) were infectious etiology, of which tuberculosis was the commonest infection (14 patients; 58.3%); followed by Herpes zoster (4 patients, 16.7%); Syphilis (1 patient, 4.2%), Leprosy (2 patients, 8.3%), and HIV retinopathy (3 patients, 12.5%). Among the specific etiology of non-infectious origin (24 patients, 50%), Rheumatoid arthritis was the commonest (14 patients, 58.3%), followed by pars planitis (6 patients, 25%); Ankylosing spondylitis (3 patient, 12.5%); and Juvenile Rheumatoid arthritis (1 patient, 4.2%). In anterior uveitis, a specific associated disease could be established in 26 patients (51%). The most common among them for anterior uveitis was Rheumatoid arthritis in 14 patients (27.5% of anterior uveitis patients) followed by Herpes zoster (4 patients) and Tuberculosis (2 patient). In posterior uveitis, the specific diagnosis could be established in 14 cases (40%). Tuberculosis (10 patients, 28.6%) was the most common specific associated disease in posterior uveitis; followed by Syphilis (1 patient) and AIDS (3 patients).

In intermediate uveitis, no specific cause could be found; these were labeled idiopathic pars planitis. In the panuveitis group, 2 patient (25%) had Tuberculosis. In 6 patients (75%), the etiology could not be determined.

Table 10: Complications

Complications	No. of cases	Percentage (%)
Macular oedema	18	18
Raised IOP	16	16
Cataract	12	12
Band Shaped Keratopathy	4	4
Retinal Detachment	2	2

The table 17 shows the complications of uveitis in present study. The complications were observed in 52 eyes (52%). The most common complications encountered in our patients were cystoid macular oedema (18%), intraocular pressure elevation (>21mmHg) (16%), and cataract (12%).

Discussion

The variation in the spectrum of uveitis is largely due to complex geographic, ecological, racial, nutritional and socioeconomic differences**.** Our uveitis study population had fairly homogenous background; all patients were Asian Indians and majority of patients belonged to south India.

In our study, females were more affected than males and the age at onset of uveitis widely varied, with a peak in the fourth and fifth decades. However, the mean age at presentation in our study (approximately 40 years) appeared to be slightly higher than that found in most previous reports (approximately 35 years) [2, 6]. Children comprised 6% of new uveitis patients in our study, which was similar to most estimates from previous studies [9, 10].

Considering different uveitis classification criteria, the most common types of uveitis in our patient population were idiopathic, anterior, chronic, non-granulomatous, and noninfectious. The fact that chronic uveitis was the most common type (67%) probably reflects the referral character of our clinic and indicates that most patients with acute uveitis were treated by local ophthalmologists and not referred. This may also be due to the fact that most of the episodes of acute anterior uveitis resolve on their own, therefore many patients do not go for evaluation.

Overall, acute uveitis comprised 33% of the patient population and was particularly common in posterior (31.5%) uveitis. Chronic uveitis was particularly predominant among patients with panuveitis (75%), which is similar to other published studies [11].

Anterior uveitis (51%) was the most common anatomical type of uveitis in our study. This was similar to several series in India [12, 13] and elsewhere in other countries [14]. In contrast, in the study by Henderly *et al*. [15] posterior uveitis was most common form of uveitis (38.4%) in the USA.

Data from referral centers revealed that anterior uveitis was the most common form of uveitis (27.8–63%), followed by posterior (9.3–38%) or panuveitis (7–38%), and intermediate uveitis (4–17%) [16].

The frequencies for various forms of uveitis in our study were comparable to those of studies from tertiary referral

centers.

The results of our study showed that for a large proportion of patients (48%), a definitive or presumed specific diagnosis was established based on history, including a review of medical systems, a comprehensive ophthalmologic examination, and selected laboratory and ancillary tests. The reported frequency of a systemic disease or a specific ocular entity underlying uveitis varies from 47.1 to 69.7% [17].

The proportion of idiopathic uveitis cases in our series varied, depending on the site of inflammation, from 54% in patients with posterior uveitis to all the patients in patients with intermediate uveitis. Similarly, results of most previous studies showed that the great majority of intermediate uveitis was idiopathic. There was however a large discrepancy between different studies in the proportion of idiopathic cases among other forms of uveitis [16].

The most common underlying cause for non-infective anterior uveitis was Rheumatoid arthritis (14 patients, 27.5%), which is in contrast to trends observed in other studies previously [19, 12]. Amongst the infective etiologies of anterior uveitis, tuberculosis constituted 7.7% of anterior uveitis patients. A somewhat similar incidence has been reported in a study from North India and Italy [18] where 7.9% and 6.31% of the anterior uveitis patients had a tubercular origin respectively.

Herpes zoster infection, presenting as anterior uveitis or keratouveitis, diagnosed based on clinical features, was found to be the most common infective cause of anterior uveitis in our series. The rate of herpetic uveitis in our patients (15.4%) is high compared to those found in previous reports [12]. It is unclear if this discrepancy is due to differences in the circulating virus's virulence, background immunity, or prevalence of other predisposing genetic or acquired conditions in the affected populations.

Majority of the cases of posterior uveitis were idiopathic (54%) in nature in our study. Tuberculosis was the most common underlying infective cause (10 patients, 28.6%) of posterior uveitis, which was significantly higher than other reports [19]. In other studies toxoplasma was the most common cause of posterior uveitis [15].

Other infective causes of posterior uveitis in our study were HIV retinopathy (3 patients, 8.6%), and syphilis (1 patient, 2.9%). Tuberculosis was most common cause of panuveitis among specific etiology diagnosed (25% of panuveitis patients). This was similar to study carried out by Singh *et al*. [19] (26%), which was significantly higher than other reports by Rodriguez *et al*. [11] (2.0% of panuveitis patients), Biswas *et al*. [12] (2.16% of panuveitis patients), and Mercanti *et al*. [18] (5.8% of panuveitis patients).

Early recognition of uveitis patients is very important as chronicity of the disease leads to increase in the rate of complications affecting vision. Accurate diagnosis and timely treatment decreases the chances of recurrence and has good visual prognosis and therefore is key in management of uveitis.

The common complications encountered in our study were cystoid macular oedema (18%), RIOP (16%), cataract (12%) followed by raised intraocular pressure, band shaped keratopathy and retinal detachment. These findings were consistent with various other studies done elsewhere [20]. These complications were treated accordingly.

Our study institute being a rural referral centre, more patients with posterior uveitis and panuveitis could have been referred and hence the total incidence quoted may not truly reflect the actual incidence in the population.

Conclusion

Uveitis, irrespective of its type and presentation, is a chronic progressive disease with potentially blinding consequences. The etiology is varied and remains undetermined in most cases. The challenge in a case uveitis is to develop tailored laboratory investigations that will facilitate a diagnosis.

Ordering a standard battery of tests for uveitis patients leads to delay in diagnosis and excessive expense. A more fruitful method is to first consider which diagnosis are more likely considering the factors like, the patients' age, sex, history, ocular examination findings and then performing tailored laboratory evaluation.

In all cases of uveitis a thorough ocular examination should be done, including posterior segment. A thorough systemic examination should be done to rule out systemic disease, as it may be an early manifestation of systemic disease.

Chronicity increases the risk of complications as does delay in receiving appropriate therapy, but early recognition and treatment of patient who are prone to recurrences can improve their outcome.

In our study anterior uveitis was most common type followed by posterior uveitis. The most common specific etiology was tuberculosis; however most of the cases were idiopathic. There was no significant sex predisposition seen.

Availability of specific investigation facilities at the rural level will help in deriving a region specific list of differential diagnosis which in turn will help in early treatment and taking preventive steps towards visual complications. Adoption of a universal classification systems and population-based studies in all countries may provide more reliable data for comparisons among different regions.

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Conflict of Interest

None

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