

Pattern of Uveitis in a Secondary Eye Care Center at Panipat, Haryana

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Background: Uveitis pattern varies according to regional, demographic, and racial factors. Therefore, an epidemiological study of the distribution of uveitis in various regions in India is likely to provide valuable information. There is no study available on the pattern of uveitis from Haryana.

Aim: To report the pattern of uveitis in a secondary eye care center in Panipat, Haryana.

Material and Methods: A retrospective study was conducted on 65,126 new patients who attended the Ophthalmology outpatient department of a secondary eye care hospital in Panipat from April 2015 to October 2023. The data of all the subjects is taken from electronic medical records analyzed.

Results: Minimum age of the patients was 8 years, the maximum was 95 years and the mean age was 42.28 years. Out of 65,126 cases, 377 were found to have uveitis. The cumulative incidence proportion of uveitis among new patients attending our institute during the study period was 0.58%. The majority of patients were of anterior uveitis 158 (41.8%) and the minimum belonged to intermediate uveitis 39 (10.3%). It was also seen that the maximum cases were unilateral. Tailored laboratory investigations were done in all the cases. The most common cause was found to be idiopathic.

Conclusion: Anterior uveitis is the most common entity in secondary care and the most common etiology found to be idiopathic.

Keywords: uveitis, pattern of uveitis, secondary eye care center, Haryana

Introduction

Uveitis is the inflammation of the uveal tract, which may also be accompanied by inflammation of adjacent ocular tissues like the retina, sclera, cornea, vitreous, and optic nerve. In India, it is thought to affect 730 out of every 100,000 people.¹

According to a study conducted in North and South India, the uveitis incidence among the patients attending tertiary eye care facilities in India is estimated to be 1.31 and 0.8%, respectively.^{2,3} About 25% of blindness in developing countries is attributed to visual morbidity due to uveitis which can be caused by the disease itself, its complications, and treatment.⁴⁻⁸ Hence, Early detection and prompt treatment are of paramount importance.⁴

The proper diagnosis of uveitis is frequently difficult since these patients exhibit a wide range of systemic as well as ocular signs and symptoms. The cause of uveitis is still unknown in a sizable portion of cases, despite advances in our knowledge of etiopathogenesis and the development of advanced diagnostic methods. Uveitis is caused by both infectious and non-infectious etiology.^{9,10}

Standardization of Uveitis Nomenclature (SUN) Working Group provides the anatomical classification of uveitis into anterior, intermediate, posterior, and panuveitis.¹¹ The population, genetic makeup, environmental conditions, and a variety of other factors, including the accessibility of medical and laboratory facilities, can all affect the etiology and clinical presentation of uveitis.

Numerous studies conducted over the years in countries all over the world have revealed a shifting tendency in the clinical profile, pattern, and etiology with time, and India is no exception.¹²⁻¹⁴ This developing tendency has been

influenced by advancements in diagnostic tools, a better understanding of ocular immunology, relatively recent imaging modalities, and the eradication of specific infectious agents.

It has been found that various regional, demographic, and racial factors all have an impact on the pattern of uveitis. Therefore, an epidemiological study of the distribution of uveitis on the Indian subcontinent is likely to be informative and help suggest topics for future clinical and basic research into uveitis in that particular region.¹⁵ It could even help in having a focused baseline investigation to examine the case of uveitis to arrive at an accurate etiological diagnosis using a personalized strategy unique to that region. Unfocused laboratory testing would be a time-consuming, ineffective process that would cost the patient money.¹⁶

There has been a lot of research on the epidemiology and etiologies of uveitis in different geographic regions from Western and Asian countries. The first report on the pattern of uveitis from India was published in 1995.¹⁷ It identified the etiological trend of uveitis in the south Indian population. Our study aims to identify the cause of uveitis, and associated systemic conditions, and compare the pattern seen in this secondary eye care center at Panipat, Haryana.

Material and Methods

A retrospective study was conducted on patients attending the ophthalmology outpatient department of a secondary eye care hospital in Panipat, Haryana, between April 2015 and October 2023. During this period, a total of 65,126 new patients attended the outpatient department, of whom 377 were newly diagnosed cases of uveitis and included in the study.

Only newly diagnosed cases of uveitis diagnosed for the first time at our study centre were included. Patients who were referred from other centres with a pre-existing diagnosis of uveitis were excluded. Repeat visits of the same patient were excluded, and only the first presentation was considered for analysis. Patients with a history of previous ocular surgery, post-operative uveitis, traumatic uveitis, or incomplete medical records were excluded from the study.

The data of all subjects were taken from the electronic medical records of the hospital for the last 102 months. The data included the findings of slit lamp examination, the anterior chamber reaction including cells and flare, the intraocular pressure (IOP) which was measured using a non-contact tonometer or Goldmann applanation tonometer, the findings of fundus examination using a +90 D lens, and peripheral examination using an indirect ophthalmoscope and +20 D lens.

All patients underwent a systematic and tailored investigative work-up based on clinical presentation and suspected etiology. Baseline investigations included complete blood count, erythrocyte sedimentation rate, and C-reactive protein. Etiology-specific investigations included Mantoux test and chest radiography or CT scan for tuberculosis; HLA-B27 testing for suspected spondyloarthropathy; serum angiotensin-converting enzyme levels and chest imaging for sarcoidosis; VDRL/TPHA for syphilis; rheumatoid factor and ANA for connective tissue disorders; and neuroimaging where multiple sclerosis was suspected.

Other ocular investigations like ultrasonography, ultrasound biomicroscope, fluorescein angiography, indocyanine green angiogram, and optical coherence tomography were performed in required cases. The classification of uveitis was done based on the International Uveitis Study Group (IUSG)¹⁸ and the Standardization of Uveitis Nomenclature (SUN)¹¹ working group's criteria.

The demographic information, laterality, type, etiology, course, and length of follow-up for each patient were also recorded. The relevant reports of all investigations were noted. In cases where some specific etiology was found according to investigations, it was taken as the cause and when the intraocular inflammation was not indicative of a recognized uveitis entity or could not be linked to a specific underlying systemic disease, the condition was referred to as idiopathic. The data was entered into a Microsoft Excel spreadsheet and was analyzed using Statistical Package for the Social Sciences (SPSS) software.

Results

The total duration of the study was 102 months, out of 65,126 new patients who visited our hospital, 377 were diagnosed with uveitis. The cumulative incidence proportion of uveitis among new patients attending our institute during the study period was 0.58%.

In our study, we found that the minimum age was 8 years and the maximum age was 95 years. The mean age was 42.28 years. We have also seen that the maximum number of patients belong to the age group of 31–40 years (25.46%) followed by 41–50 years (22.54%). Males were 224 (59.42%), and females were 153 (40.58%). (Table 1)

In our study, we found that the maximum number of cases (84.62%) had unilateral signs and symptoms in comparison to 15.38% of cases that had bilateral signs and symptoms and were diagnosed of uveitis.

In our study, we found that the maximum number of cases, 158 were of anterior uveitis (41.8%) followed by posterior uveitis 132 cases (35.1%). Panuveitis cases were 48 (12.8%) and the minimum cases were of intermediate uveitis 39 (10.3%) cases. (Table 2)

In our study, we found that the maximum number of cases, 342 cases had an acute onset of uveitis (90.7%) followed by recurrent in 24 cases (6.5%) and 11 (2.9%) of cases had chronic.

In our study, we found that in the maximum number of cases, 134 (35.5%) cases had idiopathic etiology followed by miscellaneous cases in which no etiology could be diagnosed 133 (35.3%), the cases with infectious etiology 57 cases (15.2%) and the minimum number 53 (14%) of cases had non-infectious etiology. (Table 3)

Table 1 Distribution of Patients According to Age Group

Age Group	Number of Patients	Percentage
1-10 years	1	0.26%
11-20 years	17	4.5%
21-30 years	44	11.68%
31-40 years	96	25.47%
41-50 years	85	22.55%
51-60 years	76	20.16%
61-70 years	40	10.61%
>71 years	18	4.77%

Table 2 Distribution of Patients According to the Type of Uveitis

Type of Uveitis	Number of Patients	Percentage
Anterior	158	41.8%
Intermediate	39	10.3%
Posterior	132	35.1%
Panuveitis	48	12.8%

Table 3 Distribution of Patients According to the Etiology of the Disease

Etiology	Number of Patients	Percentage
Idiopathic	134	35.5%
Infectious	57	15.2%
Non-Infectious	53	14%
Miscellaneous	133	35.3%

Table 4 Distribution of Patients According to the Type and Etiology of the Disease

Etiology	Anterior	Intermediate	Posterior	Panuveitis
Idiopathic	92 (58.2%)	18 (46.1%)	16 (12.2%)	8 (16.7%)
Tuberculosis	16 (10.1%)	8 (20.5%)	15 (11.3%)	6 (12.5%)
Syphilis	1 (0.6%)	1 (2.6%)	2 (1.5%)	0
Toxoplasma	0	0	3 (2.3%)	0
Viral	5 (3.2%)	0	0	0
HLA-B27	13 (8.2%)	0	1 (0.8%)	3 (6.2%)
Rheumatoid Arthritis (RA)	2 (1.3%)	0	0	2 (4.2%)
Sarcoidosis	0	4 (10.2%)	5 (3.7%)	2 (4.2%)
Vogt-Koyanagi-Harada	0	0	3 (2.3%)	13 (27%)
Multiple Sclerosis	0	1 (2.6%)	0	0
Collagen Disorder	4 (2.6%)	0	0	0
Miscellaneous	25 (15.8%)	7 (18%)	87 (66%)	14 (29.2%)
Total	158	39	132	48

In our study, we found that among the cases of anterior uveitis maximum of 92 (58.2%) had idiopathic etiology, followed by miscellaneous etiology 25 (15.8%). Tuberculosis 16 (10.1%) was our study's third most common cause of anterior uveitis. This was followed by HLA-B27 13 (8.2%), viral 5 (3.2%), collagen disorders 4 (2.6%), rheumatoid arthritis 2 (1.3%), and syphilis 1 (0.6%) respectively. No patient in the anterior uveitis group had toxoplasma, sarcoidosis, Vogt-Koyanagi-Harada (VKH), and multiple sclerosis as the etiology.

Among the cases of intermediate uveitis, a maximum of 18 (46.1%) patients belong to idiopathic etiology followed by tuberculosis 8 (20.5%), miscellaneous 7 (18%), and Sarcoidosis 4 (10.2%). One case (2.6%) was found to have syphilis and one case had multiple sclerosis.

Among the cases of posterior uveitis, a maximum of 87 (66%) patients belong to miscellaneous etiology followed by idiopathic 16 (12.2%), and tuberculosis 15 (11.3%). This was followed by sarcoidosis 5 (3.7%), VKH 3 (2.3%), toxoplasma 3 (2.3%), syphilis 2 (1.5%).

Among the cases of panuveitis maximum of 14 (29.2%) had miscellaneous etiology, followed by VKH 13 (27%), idiopathic 8 (16.7%), and tuberculosis 6 (12.5%). 2 (4.2%) cases each belong to rheumatoid arthritis and sarcoidosis etiology. (Table 4)

Uveitis cases were categorized as idiopathic when no specific etiology could be established despite appropriate clinical evaluation and relevant investigations. The miscellaneous category included cases in which an etiology was suspected based on clinical features or partial investigations but could not be conclusively classified into a defined etiological group due to inconclusive findings, limited diagnostic facilities, or rare/unclassified causes.

Discussion

The pattern of uveitis changes due to the development of novel diagnostic methods, changes in lifestyle, and variations in the patterns of infectious diseases. Comparing treatment methods, management, prognosis, and complications of uveitis requires periodic analysis of these changes in the epidemiology of uveitis patterns. We tried to compare the situation of uveitis over the previous few decades because the reasons can alter over time and with changing generations. To help clinicians in their consideration of alternative diagnoses and clinical investigations, epidemiologic knowledge is crucial.¹⁹

An essential health indicator is a changing pattern of any disease in a portion of the population. Numerous accounts from other regions of India and the world have similar details.^{20–22} These studies are essential in raising public awareness of regional heterogeneity in illness configuration, which serves as a key health predictor in epidemiological research.

The trend and pattern of uveitis were compared between the current study and the earlier studies, and some similarities and differences were found. In our study, we found that the mean age was 42.28 years which is comparable to a study done by Pandurangan et al in their study that found the mean age was 39.1 years.²³

In earlier studies from India, a male predominance was seen.^{6,12,17} This male predominance has been linked to the fact that men seek medical attention more frequently than women and that their socioeconomic habits put them at a high risk of exposure to infectious pathogens. It is typically reported that gender distribution in industrialized countries is equal or somewhat in favor of women.^{24–26} There was a male majority in our study also (59.42%).

In our study, we found that a maximum of patients 84.62% had unilateral signs and symptoms in comparison to bilateral. In a study done by Pandurangan et al,²³ they also found that in most cases 61.8% presenting to them had a unilateral presentation.

In terms of anatomical position, research conducted all over India has consistently demonstrated that anterior uveitis is the most frequently observed anatomical location in clinical practice, with posterior or panuveitis being reported in fewer cases.^{3,5} The least commonly found was the intermediate uveitis cases. Similarly in our area, we also found that the maximum cases belonged to anterior uveitis (41.8%) and the least to intermediate uveitis (10.3%).

In our study, we found that the majority of uveitis cases (90.7%) had an acute onset, followed by a smaller percentage with recurrent episodes (6.5%) and an even smaller percentage with a chronic onset (2.9%). Similarly, Pandurangan et al reported that a significant portion of their study participants experienced an acute course (55.3%), while a substantial number had a chronic course (23.4%), and a smaller proportion had recurrence (21.3%).²³

In our study, we found that the most common etiology of uveitis was idiopathic, accounting for 134 cases (35.5%). This was followed by cases where no specific etiology could be identified, totaling 133 cases (35.3%). Infectious causes were identified in 57 cases (15.2%), while non-infectious causes were found in the fewest cases, totaling 53 (14%). Similarly, Pandurangan et al reported that in their study, specific etiologies were identified in 61 eyes (43.3%). Among these, infectious etiology accounted for 33 eyes (23.4%), and non-infectious etiology for 28 eyes (19.9%). A significant proportion of cases, 80 eyes (56.7%), were classified as idiopathic due to the inability to establish a specific etiology.²³ This comparison highlights the distribution of uveitis etiologies between the two studies, emphasizing variations in the proportions of idiopathic cases and those with identified infectious and non-infectious causes.

In our study, we observed that the most common type was anterior uveitis. Among patients with anterior uveitis, the majority (58.2%) had an unknown cause (idiopathic), while 15.8% were classified under miscellaneous causes due to limited testing availability. Tuberculosis accounted for 10.1% of cases, making it the third most common cause. HLA-B27 was found responsible for 8.2%, viral causes for 3.2%, collagen disorders for 2.6%, rheumatoid arthritis for 1.3%, and syphilis for 0.6%. None of the patients in this group were attributed to toxoplasma, sarcoidosis, VKH syndrome, or multiple sclerosis. Similarly, Das et al²¹ in their study found that the most frequent type of uveitis observed in their study was anterior uveitis, accounting for 47.07% of all cases. Among these cases, a specific diagnosis could be determined in 79 cases (54.49%). The leading identified cause was seronegative spondyloarthropathy, identified in 34 cases (23.44%), followed by traumatic anterior uveitis in 25 cases (17.24%), and intraocular lens (IOL)-induced uveitis in 10 cases (6.89%). Other identified causes included Fuchs heterochromic cyclitis (seven cases), herpes zoster virus uveitis (one case), leprosy (one case), and parasitic uveitis (one case). In 66 cases (45.51%), the cause of anterior uveitis remained idiopathic.

In our study we found that among intermediate uveitis cases, the leading cause was idiopathic in 46.1% of patients, followed by tuberculosis (20.5%), miscellaneous causes (18%), and sarcoidosis (10.2%). Syphilis and multiple sclerosis each accounted for 2.6% and 2.6% of cases, respectively. A study by Das et al²¹ found that in the intermediate uveitis subgroup comprising 40 cases (12.98%), the majority (77.5%) were diagnosed with idiopathic cases. Specific diagnoses were established in the remaining nine cases, with sarcoidosis identified in five cases and tuberculosis in four cases as the predominant underlying causes.

Das et al²¹ in their study found that posterior uveitis group, which consisted of 92 cases (29.87%), ocular toxoplasmosis was the most prevalent, accounting for 37 cases (40.21%). Idiopathic choroiditis followed with 18

Table 5 Comparison of Uveitis Patterns Across Different Studies

Parameter	Present Study (Panipat, Haryana)	Pandurangan et al	Das et al
Study period	2015–2023	Not specified	Not specified
Mean age (years)	42.28	39.1	Not specified
Gender predominance	Male (59.42%)	Male predominance	Male predominance
Laterality	Unilateral – 84.62%	Unilateral – 61.8%	Not specified
Most common anatomical type	Anterior uveitis (41.8%)	Anterior uveitis	Anterior uveitis (47.07%)
Least common anatomical type	Intermediate uveitis (10.3%)	Not specified	Intermediate uveitis (12.98%)
Course of disease	Acute – 90.7% Recurrent – 6.5% Chronic – 2.9%	Acute – 55.3% Chronic – 23.4% Recurrent – 21.3%	Not specified
Overall most common etiology	Idiopathic (35.5%)	Idiopathic (56.7%)	Idiopathic common
Infectious etiology	15.2%	23.4%	Common
Non-infectious etiology	14%	19.9%	Common
Anterior uveitis – leading cause	Idiopathic (58.2%)	Not specified	Seronegative spondyloarthropathy (23.44%)
Anterior uveitis – TB	10.1%	Not specified	Rare
Intermediate uveitis – leading cause	Idiopathic (46.1%)	Not specified	Idiopathic (77.5%)
Posterior uveitis – leading cause	Miscellaneous (66%)	Not specified	Ocular toxoplasmosis (40.21%)
Posterior uveitis – TB	11.3%	Not specified	5.43%
Panuveitis – leading cause	Miscellaneous (29.2%)	Not specified	VKH disease (45.16%)
Panuveitis – VKH	27%	Not specified	45.16%

cases (19.56%), while serpiginous choroiditis was observed in 14 cases (15.21%). Other specific diagnoses included acute posterior multifocal placoid pigment epitheliopathy (APMPPE) in five cases, multifocal choroiditis in four cases, tuberculosis in five cases, toxocara in four cases, cytomegalovirus (CMV) retinitis in two cases, syphilis in one case, punctate inner choroidopathy in one case, and acute retinal necrosis (ARN) in one case. In our study among patients with posterior uveitis, the majority (66%) had miscellaneous causes, followed by idiopathic cases (12.2%). Tuberculosis (11.3%). Sarcoidosis (3.7%), VKH syndrome (2.3%), toxoplasma (2.3%), syphilis (1.5%), and HLA-B27 (0.8%) were also identified as other causes.

Das et al²¹ found that in the panuveitis group, which comprised 31 cases (10.06%), VKH disease was identified as the leading cause, accounting for 14 cases (45.16%). Sarcoidosis followed with nine cases, while idiopathic cases were five. Other less frequent causes included Behcet's disease (one case), sympathetic ophthalmia (one case), and parasitic panuveitis (one case). On the contrary in our study the most common etiology was miscellaneous (29.2%), followed by VKH disease (27%), idiopathic (16.7%), and tuberculosis (12.5%) among panuveitis cases. HLA-B27 was found in 6.2% of cases, while rheumatoid arthritis and sarcoidosis each accounted for 4.2%. (Table 5)

Conclusion

Anterior uveitis is the most common anatomic type of uveitis in our hospital and the most common etiology found to be idiopathic. Tuberculosis was the most common etiology among the infective cases. Among the non-infectious etiology sarcoidosis and HLA-B27 were most common. Our study was the first study of the pattern of uveitis in Haryana.

Ethical Approval

Ethical approval for the study was obtained from the Institutional Ethics Committee, N. C. Medical College & Hospital, under approval number Ref No. IEC/Approval/2023/84. All procedures adhered strictly to the ethical standards of the committee and were conducted in accordance with the principles outlined in the Declaration of Helsinki.

Consent

The requirement for informed patient consent was waived by the Institutional Ethics Committee of N.C. Medical College & Hospital as the study involved retrospective review of medical records with no direct patient interaction. All patient data were anonymized, and confidentiality was strictly maintained in accordance with institutional and ethical guidelines.

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Disclosure

The authors report no conflicts of interest in this work.

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