A Study on the Pattern of Uveitis and Any Seasonal Variation in the Incidence of Uveitis at a Tertiary Care Hospital of Delhi, India

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Abstract

Purpose: To analyze the patterns of uveitis and any seasonal variation in the incidence of uveitis at a tertiary care hospital of Delhi, India.

Methods: The study included 100 new patients with uveitis examined in the Department of Ophthalmology at a tertiary care hospital of south Delhi, India from January 2016 to Dec 2017. We grouped the months of the year into winter, transitional and summer seasons according to the average temperature in New Delhi. Data was entered into Microsoft Excel spread sheet and analysis was done. Chi Square test was applied wherever necessary and p values were calculated at 95% confidence level.

Results: There was male predominance (62%) with male to female ratio of 1.6: 1. The overall mean age of presentation was 35.4 years. The maximum number of patients were adults in the age group 31-40 years while the minimum were elderly above 60 years. Among all the cases, 44% cases occurred in the right eye, 40% in left eye and 16% had bilateral uveitis. Anterior uveitis was diagnosed in 88% of cases, posterior uveitis in 2%, and intermediate uveitis in 10% of cases. Out of 100 patients, 79% were idiopathic. A probable diagnosis was determined in 21% of cases; 10% cases were positive for HLAB27, and 5% were positive for tuberculosis. It was observed that there was seasonal trend in occurrence of the cases. Most of the cases occurred in the month of winter but no statistical significance was observed. (p value over seasons: 0.227603883; p transitional vs. winter season: 0.084838; p summer vs. winter season: 0.084838; p summer vs. transitional season: 0.3017).

Conclusion: Idiopathic uveitis was highest in our study. HLA B27-associated uveitis was the most common noninfectious entity and tuberculosis was the leading cause for infectious entities in our study. Although the difference in the incidence of new acute uveitis among the three seasons was not statistically significant, a distinctly higher number of cases were seen in winters followed by transitional season and minimum in summers in both the consecutive years.

Introduction

Uveitis is a potentially sight-threatening disease affecting people from all over the world. It attributes to 10% of blindness in the Western world.1 Uveitis refers to intraocular inflammation involving not only the uvea but also the adjacent structures like retina and vitreous. According to the International Uveitis Study Group system, uveitis was classified into anterior uveitis, posterior uveitis, intermediate uveitis, or panuveitis. Acute uveitis was defined as sudden onset of intraocular inflammation lasting less than 3 months and chronic uveitis as inflammation lasting longer than 3 months.2 In the management of uveitis, a correct etiological diagnosis for example infectious, autoimmune and traumatic is important. The uveitis pattern is largely influenced by multiple factors like geographic, environmental, genetic, ethnic and diagnostic criteria. The pattern of uveitis is also changing over time with the identification of newer uveitic entities and improved diagnostic techniques.3 In one study, seasonal variation was reported in all uveitis cases,4 while in few other studies, seasonal variation has been reported in acute anterior uveitis.5-7 In contrast to other eye diseases, uveitis may have a strong economic impact on society because it often affects younger working-age patients.8 Numerous studies on the pattern of uveitis and seasonal variation in various geographic regions from Western countries and Asia have been published, showing similarities and distinct differences in epidemiologic profiles and etiologies of uveitis. Data on uveitis and seasonal variation from the capital of India are scarce. The objective of our study was to identify the pattern of uveitis in a tertiary care hospital in south Delhi, India and to determine if there was a seasonal variation to the incidence rate of uveitis.

Materials and Methods

One hundred patients with uveitis were seen in the ophthalmology outpatient department of tertiary care hospital, New Delhi over the 24-month period from January 2016 to December 2017. Patients with chronic uveitis, recurrent uveitis, exogenous uveitis like postoperative endophthalmitis, traumatic and secondary uveitis were excluded from the study. Demographic details of each patient was noted and a thorough ocular examination including Snellen’s visual acuity, slit lamp examination and dilated fundus examination with the help of direct and indirect ophthalmoscopy was carried out. Basic investigations like complete blood count, ESR, chest radiography, rheumatoid...
factor, Mantoux test, routine urine analysis were done in every patient. Other relevant investigations were done based on systemic symptoms like Antinuclear antibody (ANA), antinuclear cytoplasmic antibody (ANCA), HLA-B27 antigen, CT Chest, VDRL, ELISA for Toxoplasma, Toxocara and HIV, serum angiotensin converting enzyme (ACE), serum calcium. Consultation was done with the concerned medical physician whenever needed. The final etiological diagnosis was made based on clinical features, laboratory investigations and systemic evaluation.

The term idiopathic uveitis was used when clinical examination and laboratory tests failed to establish any specific diagnosis. The patient’s age, gender, residence, the year of the first episode and the month of onset of the first episode, the location of uveitis, and the diagnosis was recorded on computer. The terminology and classification of uveitis was used as given by the International Uveitis Study Group. We grouped the months of the year into winter (November, December, January, February), transitional (March, April, September, October) and summer (May, June, July, August) seasons according to the average temperature in New Delhi. We considered winter months whose average temperature was below 20°C, summer above 30°C and transitional between 20°C and 30°C. Data was entered into Microsoft Excel spread sheet and analysis was done. Chi Square test was applied wherever necessary and p values were calculated at 95% confidence level.

**Results**

A total of 100 cases of acute uveitis were diagnosed. The number of new cases from Jan 2016 to Dec 2016 was 39 while from Jan 2017 to Dec 2017, the number of new cases of acute uveitis was 61. The number of cases was more in 2017 as our hospital is established recently and with each passing year, the out patient strength is increasing. In 2016, the total patients in Ophthalmology OPD were 7200 patients and in 2017, the total patients were 11520. The incidence of uveitis was found to be 0.54% out of total of 18720 ophthalmology out patients.

**Sex and Age Distribution**

Out of total cases, 62% were male and 38% were female. There was male predominance (62%), with male to female ratio of 1.6:1. The overall mean age of presentation was 35.4 years. The maximum number of patients were in the age group of 31-40 years while minimum number of patients were found to be above 60 years (Table 1)(Figure 1).

**Laterality and anatomical distribution**

Among all the cases, 44% cases occurred in the right eye, 40% in the left eye and 16% had uveitis in both the eyes. With regard to the anatomical location, there were 88 cases (88%) of anterior uveitis, 10 (10 %) of intermediate uveitis; and 2 cases (2%) of posterior uveitis (Table 2)(Figure 2).

**Etiological Diagnosis**

Out of 100 patients, 79% were idiopathic. 10% cases were positive for HLA B27 and 5% were positive for tuberculosis (Table 2).
Table 2: Anatomical diagnosis and the etiological diagnosis of Uveitis

| Laterality      | No. of Cases of Uveitis | %  |
|-----------------|-------------------------|----|
| Right Eye       | 44                      | 44 |
| Left Eye        | 40                      | 40 |
| Both eyes       | 16                      | 16 |

**Anatomical diagnosis**

|                          | Ant. Uveitis | Int. Uveitis | Post. Uveitis |
|--------------------------|--------------|--------------|---------------|
|                          | 88           | 10           | 2             |

**Etiological diagnosis**

|                          | Idiopathic   | Rheumatoid Arthritis | HLA B27 +ve  | Tuberculosis | Sarcoidosis | Herpes Zoster Ophthalmus | Vasculitis | Total |
|--------------------------|--------------|----------------------|--------------|--------------|-------------|-------------------------|------------|-------|
|                          | 79           | 2                    | 2            | 5            | 2           | 1                       | 1          | 100   |

Table 3: Distribution of cases

| Monthly | 2016 | 2017 |
|---------|------|------|
| Jan     | 4    | 7    |
| Feb     | 3    | 7    |
| March   | 4    | 5    |
| April   | 3    | 4    |
| May     | 2    | 4    |
| June    | 3    | 4    |
| July    | 2    | 4    |
| Aug     | 3    | 4    |
| Sep     | 3    | 5    |
| Oct     | 4    | 6    |
| Nov     | 3    | 5    |
| Dec     | 5    | 6    |

Seasonal Variation

We grouped the months of the year into winter (November, December, January, February), transitional (March, April, September, October) and summer (May, June, July, August) seasons according to the average temperature in New Delhi. Months with average temperature below 20°C were considered winter, above 30°C as summer and transitional between 20°C and 30°C. Table 3 and Figure 3 shows the number of uveitic patients on monthly and seasonal basis in two consecutive years.

When we correlate with average temperature graph (Figure 4), the increase in number of patients is seen with decrease in average temperature (Figure 3). It was observed that there was a seasonal trend in occurrence of the cases. Although the difference in the incidence of new acute uveitis among the three seasons was not statistically significant, a distinctly higher number of cases were seen in winters followed by transitional season and minimum in summers in both the consecutive years (Figure 5). The p value over seasons: 0.227603883; p transitional vs. winter season: 0.485499; p summer vs. winter season: 0.084838; p summer vs. transitional season: 0.3017. These p values were not statistically significant (Table 4).
Leptospirosis was reported only infrequently established. In one study, leptospirosis was the cause in 9.7% cases of infectious uveitis in the past included toxoplasmosis (8%), herpetic disease (5%), tuberculosis (11-30%) and syphilis. The incidence of tubercular uveitis in our study was only 5% of all uveitis cases. The high incidence of idiopathic uveitis in our study may be related to lower prevalence of uveitis associated with tuberculosis, herpes and to the absence of leptospirosis, toxoplosmosis and syphilis.

Our percentage for sarcoidosis (2%) was similar to that reported in previous studies but lower than that found in others. HLA B27-positive acute anterior uveitis accounted for only 10% of all cases in our study. This rate is similar to that observed in a previous study and lower than that found in another Asian study. HLA B27 associated acute anterior uveitis is the most frequent type of endogenous uveitis, accounting for 18-32% of all anterior uveitis cases in western countries and for 6-13% of all anterior uveitis cases in Asia. The relatively lower frequency in Asia is related to the lower frequency of HLA B27 found in this population. In our study, it was observed that there was seasonal trend in occurrence of the cases. Most of the cases occurred in the month of winter, but any statistical significance was not observed (p value over seasons: 0.227603883; p transitional vs. winter season: 0.485499; p summer vs. winter season: 0.084838; p summer vs. transitional season: 0.3017). But in a study from south-western Finland, a statistically significant seasonal variation was seen. They observed a statistically significant increase in the incidence of all uveitis cases in the summer and transitional seasons compared with the winter season. In another study, the number of recurrences in the winter and transitional months was significantly higher than in the summer season (p 0.0003 and p 0.029 respectively). An increased incidence of acute anterior uveitis was observed during the months of April to October in the United States, August to November in northern Norway, spring months in Australia, during the autumn and early winter months in the Netherlands, and for 6-13% of all anterior uveitis cases in Asia and Asia.

### Discussion

For appropriate patient management, determination of pattern of presentations and etiological diagnosis is mandatory. There was male predominance (62%) with male to female ratio of 1.6:1 in our study, similar male predominance has been reported from many developing countries. In our study, the age at onset of uveitis was widely varied with a peak in the third and fourth decades. However, the mean age at presentation in our study (35.4 years) appeared to be less than that found in most previous reports (approximately 40 years). A higher incidence of anterior uveitis (88%) was striking in our study in contrast to a study with incidence of 27.8% and 39.28% in other studies.

In our study, definite etiological diagnosis could be made in only 21% of the total cases of uveitis and 79% cases were labelled as idiopathic. In previous studies, 44.42-45.51% cases were labelled as idiopathic. The results of another study showed that in a large proportion of patients (64.8%), a definitive or presumed specific diagnosis was established. Only 6% of all patients with uveitis were found to be associated with infectious etiology in our study. In one study, leptospirosis was the cause in 9.7% cases of infectious uveitis. Leptospirosis was reported only infrequently in other studies from our country. Other frequent causes of infectious uveitis were toxoplasmosis (8%), herpetic disease (5%), tuberculosis (11-30%) and syphilis. The incidence of tubercular uveitis in our study was only 5% of all uveitis cases. The high incidence of idiopathic uveitis in our study may be related to lower prevalence of uveitis associated with tuberculosis, herpes and to the absence of leptospirosis, toxoplosmosis and syphilis.

Our percentage for sarcoidosis was similar to that reported in previous studies but lower than that found in others. HLA B27-positive acute anterior uveitis accounted for only 10% of all cases in our study. This rate is similar to that observed in a previous study and lower than that found in another Asian study. HLA B27 associated acute anterior uveitis is the most frequent type of endogenous uveitis, accounting for 18-32% of all anterior uveitis cases in western countries.

### Table 4: Number of patients in each season in two years

| Season       | No. of patients in 2016 | No. of patients in 2017 | Total No. of patients |
|--------------|-------------------------|-------------------------|-----------------------|
| Summer       | 10                      | 16                      | 26                    |
| Transitional | 14                      | 20                      | 34                    |
| Winter       | 15                      | 25                      | 40                    |

### p values

- Over seasons: 0.227603883
- Transitional vs winter: 0.485499
- Summer vs winter: 0.084838
- Summer vs transitional: 0.3017

### Conclusion

As uveitis is a significant cause of visual loss and blindness, we believe that conducting periodic surveys such as ours will provide us with essential and useful knowledge for obtaining the correct diagnoses of uveitis and proper medical modalities for management and reducing the socioeconomic burden on our society as it usually affects young adults. Although the difference in the incidence of new acute uveitis among the three seasons was not statistically significant in our study, a distinctly higher number of cases were seen in winters followed by transitional and minimum in summers in both the consecutive years in our study. As our study involved a small sample size and short duration, studies involving larger sample size and a longer period would be required for better evaluation of the pattern of uveitis and to determine any seasonal pattern to the incidence rates.

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