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**Causes of Anterior Uveitis in a Tertiary Ophthalmic Care Center in North West of Iran from 2003 to 2014**

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**KEYWORDS**

Uveitis,  
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**A B S T R A C T**

The aim of this study was to assess the causes of anterior uveitis in Nikukari Hospital, Tabriz, Iran in admitted patients during 2003- 2014. Records of 220 anterior uveitis patients were investigated, retrospectively. All patients underwent complete clinical evaluations as required. Demographic data, etiologies and accompanying systemic diseases were also recorded. Of 220 diagnosed anterior uveitis patients 47/3% were male and 52/7% were female. Patients' mean age was in 37/95 ± 14/45. Unilateral uveitis consisted 94/6% of all cases in comparison to bilateral uveitis (3/6%). Moreover, 25% and 75% of cases were diagnosed as granulomatous and non-granulomatous, respectively. Causes of uveitis in 65/45% were idiopathic, whereas 26/82% and 7/73% of cases preceded autoimmune and infectious causes, respectively. The most common causes were Behcet's disease (13/2%), herpes (6/4%), multiple sclerosis (4/1%), rheumatoid arthritis (3/6%) and Ankylosing Spondylitis (2/3%). Associated systemic diseases were detected in 11.36% of patients. Furthermore HLA-B27, HLA-B5 and HLA-B51 were reported as positive in 6.4%, 1.8% and 0.5% of patients, respectively. Idiopathic causes are the most common causes of anterior uveitis and specifically, Behcet's disease and Herpes were the most common causes in North West, Iran.

**Introduction**

Anterior uveitis is the most common form of uveitis, with no particular geographic distribution (1). Epidemiologically the occurrence is 8 cases per 100000 population and the susceptibility increases with aging to 102.7 – 341 cases per 100000 of population (2, 3).

There are several known causes of uveitis including infections, trauma, ophthalmic maladies or non-infectious systemic diseases and masquerade syndromes (4). Differences in socioeconomic status, environment, and genetic susceptibilities and lifestyle standards cause distinctive variations in clinical patterns in different populations (5-

8). Various studies have investigated epidemiology of anterior uveitis and have announced different results based on geography, sex, race, social class and immunologic factors (9-14). Uveitis is of great importance in different communities and to express its importance, various epidemiological studies have been conducted in different regions of the world (15). In Iran, two studies are concentrated on the issue in 2000 and 2004 in the Labbafinejad Hospital and in the Isfahan (16, 17).

Though anterior uveitis is easily curable, its side effects such as cataract, glaucoma and macular edema can lead to impaired vision (18-24). In order to choose proper therapeutic strategies, diagnosis of the causes of anterior uveitis and detection of systemic disease are important. Using a systemic approach, diagnosis is achievable in 70% of cases (25). Occurrence of uveitis and its pattern should be identified due to the population engaged to prevent costly and unnecessary screening programs. Studies in various countries have shown similarities and differences in results, but studies concerning uveitis in the Middle East remain scant. (21, 22, 26, 27) In the present study, we attempted to explore causes of anterior uveitis in referred and admitted patients in the Nikukari Ophthalmology Hospital, Tabriz, Iran, from 2003 to 2014.

### **Materials and Methods**

In this cross-sectional study, we obtained and reviewed records of 220 admitted patients with anterior uveitis in Nikukari Hospital, affiliated to Tabriz University of Medical Sciences, Iran.

Patients had complete ophthalmic and medical examinations. Laboratory tests were requested whenever indicated. Analysis of the patients' data included causes of anterior

uveitis concerning age, sex, infectious causes, non-infectious causes, masquerade syndromes and systemic diseases accompanying anterior uveitis. Cases with non-specific clinical findings underwent additional laboratory studies such as CBC, ESR, CRP, RF and ANA tests. For non-granulomatous uveitis patients, HLA-B27 and if feasible HLA-B5 and HLA-B51 were measured. Furthermore, probable accompanying systemic diseases were further analyzed through consultation with internal medicine, pulmonology and rheumatology specialists.

For the purpose of obtaining data from hospital records, permission was acquired from regional ethics committee of Tabriz University of Medical Sciences, and also consent of hospital authorities was achieved. Also, the researchers were committed to respect all privacy policies of information and keep the personal information confidential. The collected data were statistically analyzed using descriptive statistical methods, namely (frequency, percentage, mean, and standard deviation), and Chi square, using SPSS 17. *P* value less than 0.05 was considered statistically significant.

### **Result and Discussion**

In the present study, 220 anterior uveitis patients were investigated. Patients' mean age was  $37.95 \pm 14.45$  with a median of 38 years of age. The youngest and the oldest patients were 3 and 85 years old respectively. One hundred four patients (47.3%) were males and 116 patients (52.7%) were females. Moreover, 55 cases (25%) had granulomatous uveitis whereas there were 165 non-granulomatous cases (75%). Bilateral uveitis occurred in eight patients (3.6%) in comparison to 212 unilateral uveitis patients (94.6%).

The most common cause of anterior uveitis is idiopathic causes (65.45%) and autoimmune and infectious causes are found to be responsible for 26.82% and 7.7% of all cases, respectively.

Infectious causes included herpes in 14 cases (6.4%), Tuberculosis in only one case (0.5%), and leprosy in just one case (0.5%). Autoimmune causes included rheumatoid arthritis in 8 cases (3.6%), multiple sclerosis in 9 cases (4.1%), Ankylosing Spondylitis in 5 cases (2.3%), juvenile rheumatoid arthritis in 4 cases (1.8%), Sarcoidosis in 2 cases (0.9%), scleroderma in one case (0.5%), SLE in one case (0.5%) and Behcet disease in 29 cases (13.2%). Also, masquerade syndromes were found in one case (0.5%) which included AML.

Systemic diseases was found in 25 cases (11.36%) including hypertension in 13 cases (5.9%), diabetes in 9 cases (4.1%), anemia in 2 cases (0.9%) and chronic kidney injury in one case (0.5%).

Various markers were checked among the patients. The findings revealed positive

results for HLA-B5 in 4 cases (1.8%), HLA-B51 in 2 cases (0.9%), HLA-B27 in 14 cases (6.4%), RF in 12 cases (5.5%), ANA in one case (0.5%), ESR in 2 cases (0.9%), and CRP in 2 cases (0.9%).

Occurrence of causes of anterior uveitis in different ages and between two sexes was also investigated. As shown in Figure 1, autoimmune and infectious causes had higher occurrence in men (p=0.001).

The patients were categorized into 4 age-groups in the following way: under 20 years of age (23 cases), 21-35 years of age (77 cases), 36-50 years of age (77 cases) and above 50 years old (43 cases). Leading causes of anterior uveitis in patients with an age of fewer than 20 years and over 50 years were infectious causes. However, autoimmune causes were most dominant in patients within an age range of 20 -50.

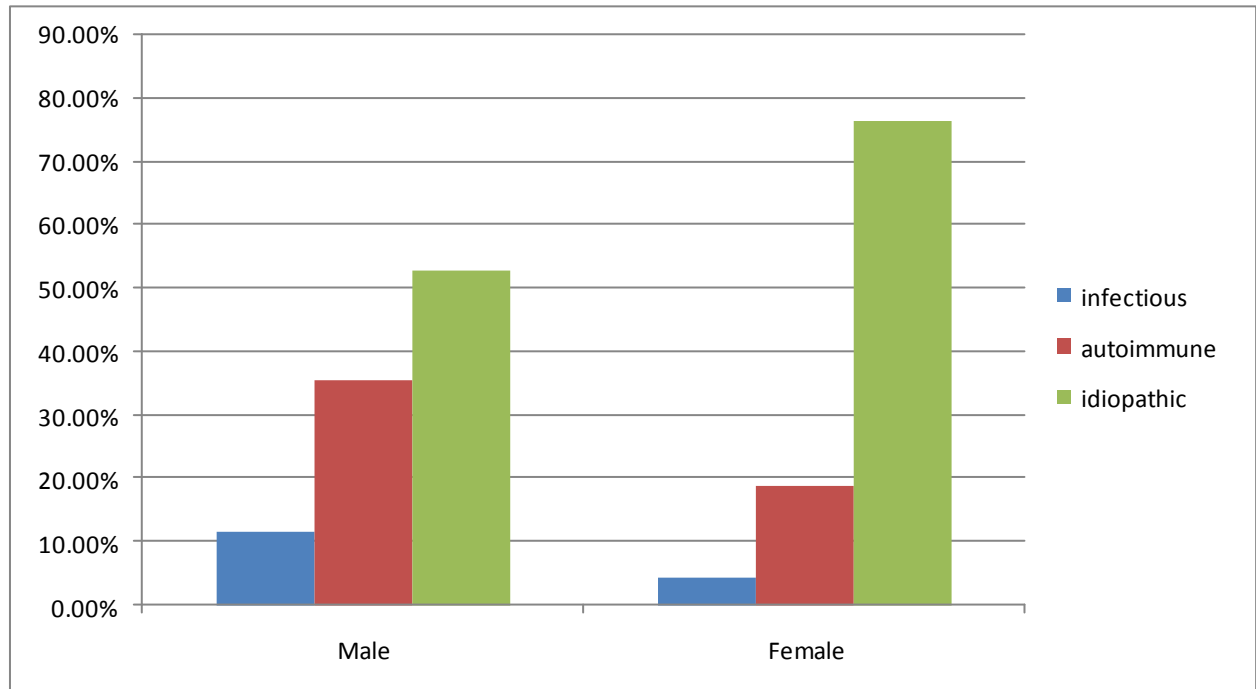
Table 2 depicts the occurrence of autoimmune causes based on systemic diseases. Based on the findings of this study, the idiopathic causes seem to be dominant in majority of the cases.

**Table1.** Occurrence of Anterior Uveitis in specified age groups

Age	Infectious	Autoimmune	Idiopathic
Under 20	3 (13%)	5 (21.7%)	15 (65.2%)
21-35	6 (7.8%)	25 (32.5%)	46 (59.7%)
36-50	3 (3.9%)	23 (29.9%)	51 (66.2%)
Above 50	5 (11.6%)	6 (14%)	32 (74.4%)

**Table2.** Occurrence of autoimmune causes based on systemic diseases

	Infectious	Autoimmune	Idiopathic
Hypertension	0	2 (15.4%)	11 (84.6%)
Diabetes	2 (22.2%)	3 (33.3%)	4 (44.5%)
Anemia	0	0	2 (100%)
Chronic Kidney Injury	0	0	1 (100%)



**Figure.1** Distribution of causes of anterior uveitis based on gender

The patterns and causes of uveitis usually differ depending on patients' demographic findings, geographic location and also the referral level of healthcare provider (primary, secondary, tertiary). Having a uveitis registration system in different locations provides useful data about its occurrence and causes. It also creates the possibility to compare and analyze findings with other countries (28).

Notably, the causes of uveitis have changed through time, so maladies like syphilis and tuberculosis which were outstanding causes of uveitis in the early 20<sup>th</sup> century have been replaced with other diseases. Nowadays, uveitis may even happen because of diseases such as AIDS and Cytomegalovirus (CMV) which were very rare until 1982 (28). The above-reported findings warrant the necessity of exploring the causes of anterior uveitis in different locations. In the present study, the etiology of anterior uveitis is studied in Nikukari Referral Hospital, situated in Tabriz, North-West of Iran.

In the present study, the relative occurrence of anterior uveitis between two sexes was almost equal. Studies conducted by Rahimi & Mir Mansoori (28) and Soheilian, Heidari, Yazdani, Shahsavari \* (29) in Iranian society had found similar findings. Studies conducted by Tan et al. (30), Guney et al. (31), and Zheng et al. (32) demonstrated that the anterior uveitis occurrence dominates among males. On the contrary, Bejwa et al. found that the occurrence dominates in females in the case of Indian patients (33).

Patients' mean age at the disease onset was 37.95±14.45 years of age and most of the patients were between 20 and 50. The findings of the present study are in line with those of the previous studies (28, 29, 31, 34). Also, Nashtaei et al. found that uveitis mostly occurs in the fourth decade of one's life in Europe and the Middle East (35).

Nonetheless, the findings from East Asian countries have indicated a higher mean age

of patients (30, 32). The discrepancy in the findings could be attributed to geographic differences.

In the present study, uveitis was unilateral in majority of cases (96.4%). As a matter of fact, in most of the cases it was found to be Nongranulomatous. Likewise, in other studies, majority of their cases suffered from unilateral anterior uveitis comprising 60% to 80% of their cases in this category (28, 30, 31). In the study carried out by Camilo et al., the occurrence with 94.9 % of the cases having unilateral anterior uveitis was similar to the present study (36). In addition, Soheilian et al. reported that most cases in their study were of Nongranulomatous type (29).

In the present study, the most prevalent cause of anterior uveitis was idiopathic. Autoimmune and infectious causes were found in 26.82% and 7.73% of cases, respectively. Also, the most common causes were found to be Behcet disease, herpes, multiple sclerosis, rheumatoid arthritis, Ankylosing Spondylitis and juvenile rheumatoid arthritis. Masquerade syndromes were detected in only one case (0.5%) which included AML.

This study found that male patients had higher occurrences of infectious and autoimmune anterior uveitis. Moreover, infectious causes had higher frequencies in the age groups of under 20 and over 50 years old. However, autoimmune causes were found to be more common in the ages between 20 and 50. Similarly, Bejwa et al. showed that infectious causes especially herpes were more frequent in males (33).

Like the present study, other studies also suggest that the idiopathic causes were the most frequent ones (29, 30, 34, 35). Comparatively, the occurrence of infectious causes was higher in these studies with a difference of 16% to 23% of causes (29, 34).

Soheilian et al. reported infectious causes in 16.5% of cases, Behcet disease as the most frequent non-infectious cause, and toxoplasmosis as the most frequent infectious cause (29). In a similar vein, other studies suggested herpes and Behcet disease as the most frequent causes (29-33, 37). Other causes such as Ankylosing Spondylitis, juvenile rheumatoid arthritis, psoriasis, Sarcoidosis, and other infectious and autoimmune causes were reported infrequently.

The present study also investigated the accompanying systemic diseases which were detected in 11.36% of all cases including hypertension in 5.9%, diabetes in 4.1%, anemia in 0.9%, and chronic kidney injury in 0.5% of cases. Frequencies of accompanying systemic diseases vary in the literature, as Kianersi et al. (34) reported 15.6%, Guney et al. (31) 20%, Prete et al. (37) 27.9%, and Soheilian et al. (29) 37.3%.

## **Conclusion**

Although the pattern, etiology and occurrence of anterior uveitis may vary according to time and location of conducted researches, it is important to evaluate the factors affecting epidemiology of the disease, for the results of this study could provide authorities, policy makers, and health care providers with useful information about regional reasons of developing anterior uveitis for the purpose of further decision makings and planning in health sectors. Based on the results of this study, idiopathic causes are the most common causes of anterior uveitis and Behcet disease and herpes are the most common causes in the North-West region of Iran. It seems that non-infectious and autoimmune causes are less common in this part of Iran. . However, further and more comprehensive examination of all patients is

warranted to corroborate the findings of this study. It seems conducting additional studies addressing all types of uveitis can provide more precise and conclusive data in this realm of research.

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