

Clinicodemographic Profile and Etiological Spectrum of Uveitis: A Retrospective Study of 120 Cases at A Tertiary Care Centre in Western Gujarat

Rashmita Gautam Kumar¹, Kukadia Gautamkumar Maganlal²

¹Assistant Professor, Department of Ophthalmology, ICARE Institute of Medical Sciences and Research, Dr. Bidhan Chandra Roy Hospital, Haldia, West Bengal, India

²Assistant Professor, Department of Ophthalmology, ICARE Institute of Medical Sciences and Research and Dr. Bidhan Chandra Roy Hospital, Haldia, West Bengal, India

Received: 10-06-2023 / Revised: 13-07-2023 / Accepted: 21-08-2023

Corresponding Author: Dr. Kukadia Gautamkumar Maganlal

Conflict of interest: Nil

Abstract

Background: Uveitis is a major cause of visual morbidity and avoidable blindness in the world with different etiological trends depending on geographical locations.

Aim: The study determines clinicodemographic status and etiological spectrum of uveitis in individuals who present to a tertiary care centre in Western Gujarat.

Methodology: It is a retrospective study of observation which has 120 patients of uveitis (above one year of age). Medical records are utilized to collect data in demographic terms, clinical characteristics, anatomic classification (SUN criteria) and etiology. The SPSS is used to perform statistical analysis and the results are presented as frequency and percentage.

Results: The age group of the patients is predominantly 21-40 years old and it is mainly male. The most common anatomy type is anterior uveitis followed by posterior uveitis and the least common are intermediate uveitis and panuveitis. The greatest etiological group is infectious, whereby, tuberculosis is the most prevalent, then viral infections, and toxoplasmosis then appear. There is also a considerable role of non-infectious cases, which are mainly HLA-B27 associated uveitis. Quite a significant number of cases is undiagnosed. Unilateral crossing takes place in most of the patients.

Conclusion: The clinical-demographic and etiology of uveitis in Western Gujarat is heterogeneous with anterior uveitis being the most common and infectious with TB being the most common. The diagnosis, extensive assessment, and specific treatment need to be conducted at an early stage to minimize complications and avoid visual impairment.

Keywords: Uveitis, Etiological Spectrum, Anterior Uveitis, Tuberculosis, Retrospective Study.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

One of the primary causes of ocular morbidity and visual disability in the world is the uveal tract (iris, ciliary body and choroid) inflammation or uveitis. Previously uveitis was considered a relatively uncommon disease, but it has become a significant health concern in the population, as it may result in preventable blindness, and it is a significant cause of global visual disability (approximately 5-10 percent of blindness) [1]. The disease is mostly common in the most productive period of the individuals hence, a huge socioeconomic expense in addition to the clinical impact [2].

Etiology of uveitis is highly heterogeneous and is linked to a shift of complex relationship of infectious, autoimmune as well as idiopathic factors. Systemic inflammatory diseases, including ankylosing spondylitis, sarcoidosis and other non-

infectious uveitis are generally caused by tuberculosis, viral infections, and toxoplasmosis that are highly prevalent in developing countries [3]. In the majority of the cases, no apparent cause is found despite numerous evaluations being made and the proportion of the idiopathic cases is high [4]. These etiological differences are attributed to the fluctuations in the geographic distribution, exposure to the environment, genetic predisposition and the provision of healthcare [5].

The clinical expression of uveitis varies depending on the site of inflammation in anatomical location which may be classified as anterior, intermediate, posterior and panuveitis. The subtypes vary with differences in clinical presentation, complications and prognostic outcomes. The late diagnosis or improper treatment can result in critical complica-

tion, such as cataract, glaucoma, macular edema and irretrievable vision loss [6]. Therefore, it is important to diagnose the underlying cause and categorize uveitis at the initial phases so that it can be effectively treated and prevented of its long-term effects.

Background of the Study: Uveitis is one of the most significant problems of the ophthalmic practice with its heterogeneous etiology and unpredictable progression. Infectious causes still dominate in developing countries such as India since most of the diseases, including tuberculosis and lack of proper sanitation are highly prevalent in the countries [7]. This has been accompanied by an increased understanding of autoimmune and systemic inflammatory diseases that cause uveitis, which is indicative of better diagnostic skills and knowledge amongst clinicians [8].

There are notable differences in the epidemiological profile of uveitis according to the regions and depend on the socioeconomic status, environmental conditions and the availability of healthcare services. In Western India especially in such states as Gujarat, there are few data on the clinicodemographic features and the etiological spectrum of uveitis patients. This dearth of region-specific data is a challenge in coming up with specific diagnostic and management strategies [9].

Besides, uveitis is a condition that mostly affects the working-age population, and has a significant economic impact with loss of productivity and high healthcare expenses. The added weight is the delayed presentation, misdiagnosis and ineffective treatment in resource-strapped environments. Thus, local trends of uveitis are crucial to understand how to enhance patient outcomes and decrease the cost of visual disability [10].

Etiological Profile and Clinical Spectrum of Uveitis: Etiological profile of uveitis is a broad spectrum of conditions which can be broadly classified into infectious and non-infectious causes. *Mycobacterium tuberculosis*, herpes viruses, and *Toxoplasma gondii* are some of the pathogens that are commonly linked with infectious uveitis, especially in endemic areas [11]. Autoimmune diseases and systemic inflammatory diseases, such as those related to HLA-B27, sarcoidosis, and Becht disease, on the other hand, are often associated with non-infectious uveitis [12].

Besides these determinable causes, a large percentage of the cases are idiopathic regardless of thorough examination. The presence of several risk factors and similar clinical presentation may often make the process of diagnosis complicated. Moreover, the subtypes of uveitis differ in distribution, with anterior uveitis being the most frequent type with posterior, intermediate and panuveitis as the next most frequent types [13].

Age, gender, genetic predisposition, and environmental exposure are some of the factors that affect the clinical spectrum of uveitis. The disease can be acute and chronic and can be of different severities and recurrence. Cases that are not well managed are associated with complications like cataract formation, secondary glaucoma and retinal damage, making it necessary to diagnose and treat them promptly [14].

Research Objectives

The objectives of the present study are:

- To determine the clinicodemographic profile of patients diagnosed with uveitis.
- To analyze the anatomical classification of uveitis among the study population.
- To assess the etiological spectrum of uveitis, including infectious, non-infectious, and idiopathic causes.
- To evaluate the distribution patterns of uveitis in relation to demographic and clinical variables.

Methodology: The current research will assess clinicodemographic features and etiological spectrum of patients with uveitis. A well-identified and systematic approach is followed to guarantee the reliability and validity of the results.

Study Design: The present research is a retrospective observational research study aimed at the analysis of the clinical data on patients with uveitis that had been recorded in the past. The retrospective design provides the opportunity of a thorough assessment of demographic attributes, clinical presentation, and etiological patterns during a specific time frame.

Study Setting: The current study is carried out in the Department of Ophthalmology of a tertiary care teaching hospital in Western Gujarat which serves a high number of urban and rural population. The hospital is a referral center with specialized ophthalmic care, and sophisticated diagnostic facilities.

Study Duration: The cases that are included in the study are within a time span of one year. All the eligible patients diagnosed with uveitis within this period are included.

Study Population: The study population is patients with uveitis who visit the ophthalmology outpatient department or are hospitalized within the study time frame.

Sample Size: The study has 120 patients that meet the inclusion criteria. The sample size is calculated by using the availability of the full medical records, and the study period.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Patients who have any form of uveitis (anterior, intermediate, posterior and panuveitis)
- Both genders of patients of any age.
- Patients who have complete and well documented clinical records.

Exclusion Criteria

- Incomplete or missing medical records of patients.
- In cases of post-traumatic uveitis, it may manifest in two forms: acute or chronic.
- Patients with post-operative inflammation of the eye.

Data Collection Procedure: Medical records, case sheets, and hospital databases are used to collect data retrospectively, through a structured data extraction form.

The parameters are measured to the following:

- **Sociodemographic:** Age, gender.
- **Clinical:** Giving symptoms, duration of illness, laterality (unilateral/bilateral).
- **The classification is based on anatomy:** Standardization of Uveitis Nomenclature (SUN) criterion (anterior, intermediate, posterior, panuveitis)
- **Etiological diagnosis:** Infectious, non-infectious (autoimmune/systemic), or idiopathic.
- **Laboratory and diagnostic tests:** Reported pertinent tests such as blood tests, radiographies, serologies and general tests.

All the data are thoroughly checked to make sure they are complete and accurate and then analyzed.

Diagnostic Criteria

Diagnosis of uveitis and classification is done using clinical examination and normal ophthalmological criteria, such as:

- Slit-lamp biomicroscope
- Fundus examination
- Intraocular pressure measurement
- Additional investigations where needed.

The etiological diagnosis is determined on the basis of clinical results with the assistance of laboratory studies and non-invasive examination in case of its availability.

Statistical Analysis: The data obtained are then inputted in Microsoft Excel and analyzed by the Statistical Package of the Social Sciences (SPSS) version 25.0.

- Frequency, percentage, mean and standard deviation are some of the descriptive statistics that are employed to generalize the data.
- Results are in form of tables and charts.
- The analysis is mainly on descriptive statistics.

Results

The current research has 120 patients with uveitis. The data collected are then analyzed in a systematic manner to assess the clinicodemographic traits, anatomy, etiological distribution, and the laterality of uveitis. Descriptive statistics like frequency and percentage are used to put the findings in the following tables to facilitate easy interpretation.

The age distribution of the patients with uveitis is examined to determine the age distribution of the study population.

Table 1: Age Distribution of Patients

Age Group (Years)	Frequency (n)	Percentage (%)
0-20	18	15.0%
21-40	60	50.0%
41-60	30	25.0%
>60	12	10.0%
Total	120	100%

As presented in Table 1, the majority of the patients (50.0%, n=60) are in the age group of 21-40, which illustrates that uveitis is more common among the people in their productive age. The age groups of 41-60 years (25.0% or 30) and 0-20 years (15.0% or 18) are seen to constitute a considerable proportion of the number of patients (30 and 18 respec-

tively). Patients at the age of over 60 years (10.0%, n=12) are the least affected group. These results imply that uveitis is more common among the young people and the middle-aged.

To determine how males and females occur in uveitis, the gender distribution of the patients diagnosed with uveitis is examined as shown in Table 2.

Table 2: Gender Distribution

Gender	Frequency (n)	Percentage (%)
Male	72	60.0%
Female	48	40.0%
Total	120	100%

Table 2 reveals that the percentage male population is higher than that of females (60.0%, n=72 versus 40.0%, n=48), which implies that there is a male dominance in the study population. The disparity indicates that males are possibly more often infected with uveitis and this could be explained by the higher degree of exposure to environmental risk factors, workplace hazards, or lifestyle factors. Despite the fact that females also take up a high pro-

portion of cases, the distribution that has been observed indicates that there is a variation in the prevalence of uveitis based on gender.

The anatomy of uveitis among the study population is discussed in order to be able to understand the distribution of various types of uveitis as shown in Table 3.

Table 3: Anatomical Classification of Uveitis

Type of Uveitis	Frequency (n)	Percentage (%)
Anterior	54	45.0%
Intermediate	18	15.0%
Posterior	30	25.0%
Panuveitis	18	15.0%
Total	120	100%

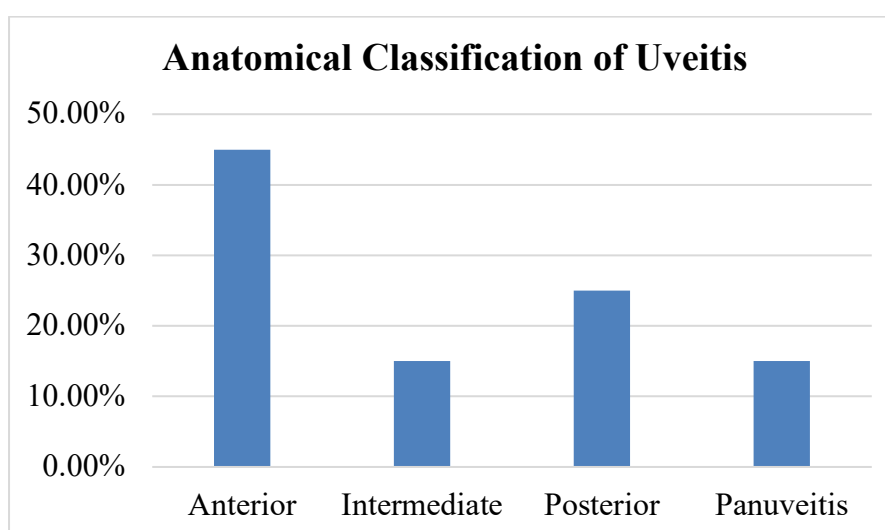


Figure 1: Visual Representation of Anatomical Classification of Uveitis

Table 3 indicates that the largest proportion of the cases (45.0%, n=54) was in anterior uveitis, which is the most common type of uveitis amongst study population. The second most prevalent one is the posterior uveitis which is found in 25.0% (n=30) of patients. Intermediate uveitis and panuveitis are each 15.0% (n=18). The dominance of anterior uveitis leads to the fact that all the types of inflam-

mation that affect the anterior part of the eye are more likely to be experienced in the clinical practice, and the anterior ones are more prevalent than the others.

Etiological classification of uveitis is examined to find out the underlying causes of the condition among the study population as shown in Table 4.

Table 4: Etiological Classification

Etiology Type	Frequency (n)	Percentage (%)
Infectious	48	40.0%
Non-infectious	42	35.0%
Idiopathic	30	25.0%
Total	120	100%

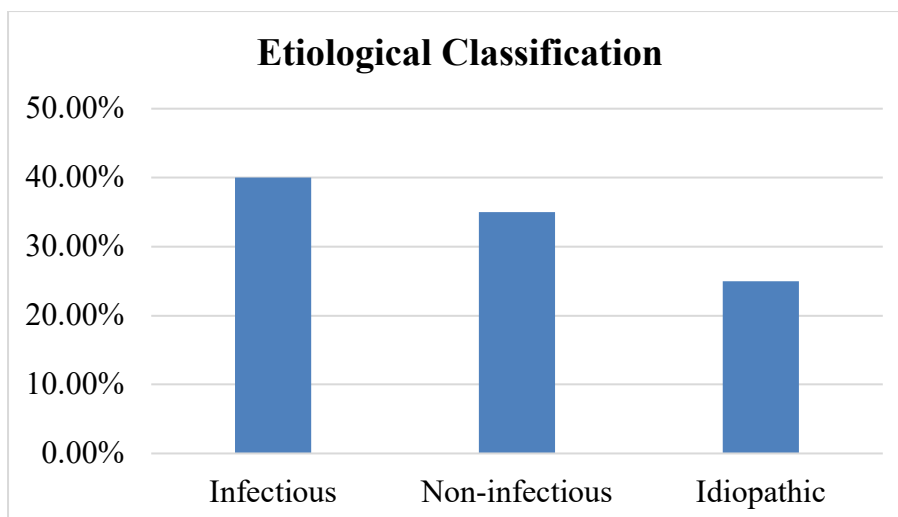


Figure 2: Visual Representation of Etiological Classification

Infectious causes are the highest amongst cases of uveitis with the proportion of 40.0% (n=48) indicating that infections are a significant factor in the development of uveitis in the study population. Autoimmune and systemic inflammatory causes (non-infectious) are 35.0% (n=42) of cases, which is a substantial role of immune-mediated processes. Also, 25.0% (n=30) of cases are idiopathic which means that no specific cause can be determined

despite a comprehensive assessment. Such results indicate the heterogeneous etiological range of uveitis, both infectious and non-infectious influences play a significant role in the disease development.

Infectious etiologies of uveitis are examined to determine the most prevalent infectious etiologies among the people studied and are represented in Table 5.

Table 5: Infectious Causes of Uveitis

Cause	Frequency (n)	Percentage (%)
Tuberculosis	18	37.5%
Viral	12	25.0%
Toxoplasmosis	10	20.8%
Others	8	16.7%
Total	48	100%

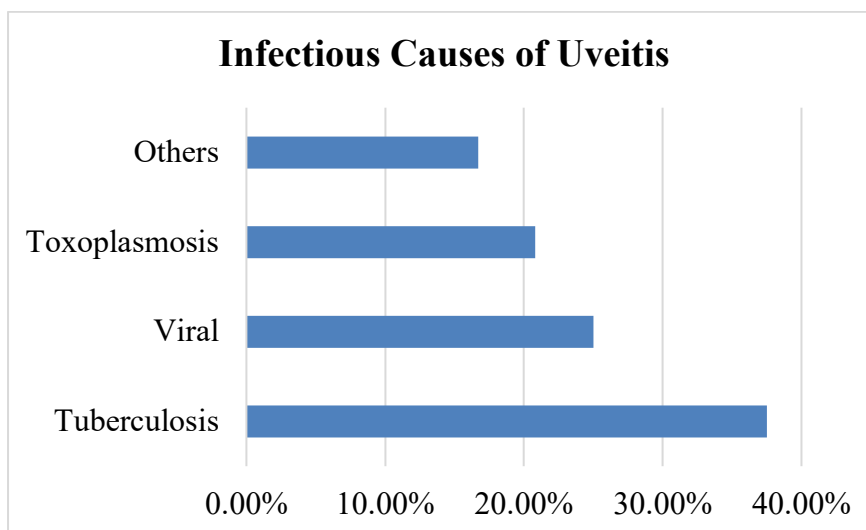


Figure 3: Visual Representation of Infectious Causes of Uveitis

Tuberculosis comprises the largest number of infectious causes of uveitis with 37.5% (n=18) cases, as indicated in Table 5. Viral infections were identified as the second most frequent reason found in

25.0 percent (n=12) of the respondents and the third reason is the toxoplasmosis with the prevalence rate of 20.8 percent (n=10). The other infectious causes have 16.7% (n=8) of cases. The vast-

ness of tuberculosis demonstrates that it is an endemic disease in the area, which is crucial in the etiology of uveitis. The findings underscore the necessity to pay attention to infectious etiologies and tuberculosis in particular as a diagnosis and treatment.

The non-infectious causes of uveitis are discussed to determine the most significant immune-mediated and systemic factors, which are provided in Table 6.

Table 6: Non-Infectious Causes

Cause	Frequency (n)	Percentage (%)
HLA-B27 Associated	16	38.1%
Sarcoidosis	10	23.8%
Autoimmune Disorders	8	19.0%
Others	8	19.0%
Total	42	100%

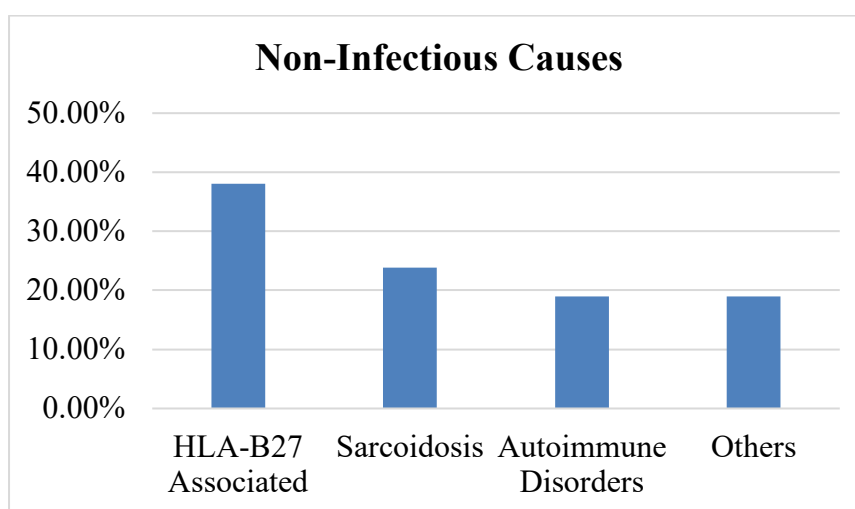


Figure 4: Visual Representation of Non-Infectious Causes

Table 6 shows that HLA-B27 associated uveitis is the highest proportion of non-infectious cases (38.1%, n=16), which is strongly linked to underlying autoimmune conditions. The cases of sarcoidosis constitute 23.8% (n=10), other autoimmune disorders, and miscellaneous causes are 19.0% each (n=8). These results underscore the importance of systemic inflammatory and autoimmune diseases in

the pathogenesis of non-infectious uveitis and the importance of comprehensive systemic assessment in those patients.

Laterality of uveitis is examined to establish whether among the study population, the condition is in one eye or both eyes as given in Table 7.

Table 7: Laterality of Uveitis

Laterality	Frequency (n)	Percentage (%)
Unilateral	84	70.0%
Bilateral	36	30.0%
Total	120	100%

Most of the cases are unilateral with 70.0% (n=84) of the patients having unilateral cases and 30.0% (n=36) bilateral cases as indicated in Table 7. This means that uveitis may affect one eye as opposed to both eyes. The unilateral presentation is predominant and indicates that the ocular localization of the disease is more common, but a considerable percentage of patients has bilateral disease that can be related to systemic or autoimmune diseases.

Discussion

The current paper examines clinicodemographic profile and etiological spectrum of patients with uveitis in a tertiary care unit in Western Gujarat. The results show that the uveitis is more prevalent among the economically productive population, with the 21-40 years (50.0%) age group being the most predominant. This finding is in line with the previous findings, which have indicated a similar age distribution (Miserocchi et al., 2013) [16]. There is also a male prevalence (60.0%) and this could be due to greater exposure to environmental

and occupational risk factors, and differences in healthcare access and utilization. These results highlight the demographic trend of uveitis and its possible socioeconomic consequences (Khairallah et al., 2013) [17].

Using anatomical classification, anterior uveitis turns out to be the most prevalent (45.0%), anterior uveitis is succeeded by posterior uveitis (25.0%), and intermediate uveitis and panuveitis are each 15.0%. This distribution is consistent with world trends, with anterior uveitis most commonly being dealt with because of its more symptomatic manifestation and earlier detection (Llorenç et al., 2015) 18. The etiological analysis has shown that infectious causes (40.0%) are of the highest prevalence with tuberculosis contributing the most. This is an indication of the endemicity of tuberculosis in the area and the importance of this in etiology of uveitis (Gueudry & Muraine, 2018) [19]. Non-infectious (35.0 percent) causes, especially HLA-B27 related uveitis and other autoimmune diseases make a significant percentage, which shows the significance of systemic assessment among the affected patients.

Also, a significant percentage of the cases (25.0%) are idiopathic, implying the difficulties in definite etiological diagnosis despite the existing research (Lee et al., 2014) [20]. The disease manifests itself mostly in unilateral cases (70.0%), and in 30.0% of patients, bilateral cases are found, although in most cases, they are accompanied by some systemic conditions. In general, the study results demonstrate the heterogeneity of clinical and etiological manifestations of uveitis in the area and the necessity of early diagnosis, evaluation, and specific treatment to avoid complications and loss of vision.

Conclusion

The present research indicates that uveitis has a heterogeneous clinicodemographic and etiological presentation among patients in a tertiary care centre in Western Gujarat. The condition is mainly found among those in the economically productive age group with a very evident male preponderance. The disease burden is the most common etiology, tuberculosis, the most prevalent infection in the region, and the most common type of anatomy is anterior uveitis. Non-infectious autoimmune disorders play a crucial role as well, which is why an in-depth systemic diagnosis is essential. The number of cases that are idiopathic is also one of the characteristics of the condition indicating that, still, there is a problem towards its diagnosis. On the whole, the results point out the significance of early diagnosis, proper etiological identification, and extensive management plans to avoid complications and minimize the risk of visual impairment related to uveitis.

References

Kumar *et al.*

1. Baby, L. S. (2018). Profile of uveitis in a tertiary care centre in South India (Doctoral dissertation, Christian Medical College, Vellore).
2. Nalcacioglu-Yuksekkaya, P., Ozdal, P. C., Yazici, A., & Tirhis, H. (2015). Clinical and demographic characteristics of patients with uveitis starting later in life. *Ocular immunology and inflammation*, 23(4), 304-310.
3. Grajewski, R. S., Caramoy, A., Frank, K. F., Rubbert-Roth, A., Fätkenheuer, G., Kirchhof, B., ... & Heindl, L. M. (2015). Spectrum of uveitis in a German tertiary center: review of 474 consecutive patients. *Ocular immunology and inflammation*, 23(4), 346-352.
4. Tsirouki, T., Dastiridou, A., Symeonidis, C., Tounakaki, O., Brazitikou, I., Kalogeropoulos, C., & Androudi, S. (2018). A focus on the epidemiology of uveitis. *Ocular immunology and inflammation*, 26(1), 2-16.
5. Ness, T., Boehringer, D., & Heinzelmann, S. (2017). Intermediate uveitis: pattern of etiology, complications, treatment and outcome in a tertiary academic center. *Orphanet journal of rare diseases*, 12(1), 81.
6. Rathinam, S. R., & Namperumalsamy, P. (2007). Global variation and pattern changes in epidemiology of uveitis. *Indian journal of ophthalmology*, 55(3), 173-183.
7. Wakefield, D., & Chang, J. H. (2005). Epidemiology of uveitis. *International ophthalmology clinics*, 45(2), 1-13.
8. Mustafa, M., Muthusamy, P., Hussain, S. S., Shimmi, S. C., & Sein, M. M. (2014). Uveitis: pathogenesis, clinical presentations and treatment. *IOSR J Pharm*, 4(12), 42-47.
9. Nguyen, M., Siak, J., Chee, S. P., & Diem, V. Q. H. (2017). The spectrum of uveitis in Southern Vietnam. *Ocular immunology and inflammation*, 25(sup1), S100-S106.
10. Chen, S. C., Chuang, C. T., Chu, M. Y., & Sheu, S. J. (2017). Patterns and etiologies of uveitis at a tertiary referral center in Taiwan. *Ocular immunology and inflammation*, 25(sup1), S31-S38.
11. Chams, H., Rostami, M., Mohammadi, S. F., & Ohno, S. (2009). Epidemiology and prevalence of uveitis: review of literature. *Iran J Ophthalmol*, 21(4), 4-16.
12. de Visser, L. (2009). Infectious uveitis. New developments in etiology and pathogenesis (Doctoral dissertation, Utrecht University).
13. Smith, J. A., Mackensen, F., Sen, H. N., Leigh, J. F., Watkins, A. S., Pyatetsky, D., ... & Goldstein, D. A. (2009). Epidemiology and course of disease in childhood uveitis. *Ophthalmology*, 116(8), 1544-1551.
14. Pichi, F., Carrai, P., Srivastava, S. K., Lowder, C. Y., Nucci, P., & Neri, P. (2016). Genetic of uveitis. *International ophthalmology*, 36(3), 419-433.

15. Birnbaum, A. D., Jiang, Y., Vasaiwala, R., Tessler, H. H., & Goldstein, D. A. (2012). Bilateral simultaneous-onset nongranulomatous acute anterior uveitis: clinical presentation and etiology. *Archives of Ophthalmology*, 130(11), 1389-1394.
16. Miserocchi, E., Fogliato, G., Modorati, G., & Bandello, F. (2013). Review on the worldwide epidemiology of uveitis. *European journal of ophthalmology*, 23(5), 705-717.
17. Khairallah, M., Kahloun, R., Ben Yahia, S., Jelliti, B., & Messaoud, R. (2013). New infectious etiologies for posterior uveitis. *Ophthalmic research*, 49(2), 66-72.
18. Llorenç, V., Mesquida, M., Sainz de la Maza, M., Keller, J., Molins, B., Espinosa, G., ... & Adan, A. (2015). Epidemiology of uveitis in a Western urban multiethnic population. The challenge of globalization. *Acta Ophthalmologica*, 93(6), 561-567.
19. Gueudry, J., & Muraine, M. (2018). Anterior uveitis. *Journal francais d'ophtalmologie*, 41(1), e11-e21.
20. Lee, R. W., Nicholson, L. B., Sen, H. N., Chan, C. C., Wei, L., Nussenblatt, R. B., & Dick, A. D. (2014, September). Autoimmune and autoinflammatory mechanisms in uveitis. In *Seminars in immunopathology* (Vol. 36, No. 5, pp. 581-594). Berlin/Heidelberg: Springer Berlin Heidelberg.