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Eiman Abd El Latif & Hatem Ammar

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ORIGINAL ARTICLE

Uveitis Referral Pattern in Upper and Lower Egypt

Eiman Abd El Latif, MD¹ and Hatem Ammar, MD²

¹Faculty of Medicine, Alexandria University, Alexandria, Egypt and ²Faculty of Medicine, Sohag University, Sohag, Egypt

ABSTRACT

Purpose: To report the pattern of uveitis in two referral eye hospitals, one in Upper Egypt and another in Lower Egypt

Methods: Retrospective chart review of all uveitis cases visiting the uveitis clinic in Alexandria and Sohag University Hospitals between May 2010 and March 2017.

Results: A total of 1315 patients (683 in Upper Egypt and 632 in Lower Egypt) were identified. Uveitis was bilateral in 56.6% of patients in Upper Egypt and in 43.6% of patients in Lower Egypt. Anterior uveitis was the most common in both regions, accounting for 34.7% and 38.2% of cases in Upper Egypt and Lower Egypt respectively. Pediatric cases constituted 18.7% of the cases in Upper Egypt and 18.1% of the cases in Lower Egypt. Specific diagnosis was established in 71.3% and 67.7% of Upper and Lower Egypt cases respectively.

Conclusions: Patterns of uveitis differ according to the geographical area in Egypt.

Keywords: Alexandria, Egypt, epidemiology, patterns of uveitis, Sohag

INTRODUCTION

“Uveitis” is a broad term that includes numerous inflammatory ocular diseases. The prevalent causes of uveitis vary markedly with the geographic region and the ethnic population. So it is crucial for ophthalmologists in every region to be acquainted with their “region-specific” pattern of uveitis and its prevalent causes. This aids identification of the causative disease and timely choice of the appropriate treatment. A number of studies have been conducted to report the pattern of uveitis and the common causative diseases around the world.^{1–3} In Egypt, uveitis has only been recently recognized as an independent ophthalmic subspecialty, and to the best of our knowledge, no multicenter study has been performed in Egypt to determine the clinical pattern of uveitis. The present study was carried out to identify the pattern of uveitis in two major, and geographically remote, tertiary eye hospitals in Egypt, a Middle Eastern Afro Asian country lying along the old Silk Route with an approximately 92 million population. For this study, a tertiary eye hospital in Alexandria, the second capital of the country, and a

densely populated metropolitan Lower Egypt governorate, and another tertiary eye hospital in Sohag, a densely populated Upper Egypt governorate, were chosen.

METHODS

Retrospective chart review of 632 patients with uveitis visiting the uveitis clinic in Alexandria main university hospital and of 683 patients with uveitis visiting Sohag main university hospital between May 2010 and March 2017 was performed. All cases underwent detailed history taking and thorough ophthalmic examination that included the best corrected visual acuity, slitlamp examination, applanation tonometry, and dilated fundus examination using a 90D lens and indirect ophthalmoscopy with a 20D lens and with scleral depression. Data about the age and gender of the patient as well as the laterality, course, duration, and etiology of uveitis were obtained. According to the SUN Working Group Classification of Uveitis, uveitis in the current study was classified into four classes:

TABLE 1. Clinical characteristics of uveitis patients.

	Upper Egypt cohort (N = 683) No. of patients (%)	Lower Egypt cohort (N = 632) No. of patients (%)	P-Value
Male	359 (52.6)	343(54.3)	0.53
Female	324 (47.4)	289 (45.7)	
Anterior uveitis	237 (34.7)	242 (38.3)	
Intermediate uveitis	149 (21.8)	162 (25.6)	
Posterior uveitis	169 (24.7)	134 (21.2)	
Panuveitis	128 (18.7)	94 (14.9)	0.048
Age categories (years)			
<18 years	128 (18.7)	115 (18.2)	
1. year	473 (69.3)	452 (71.5)	
>45 years	82 (12)	65 (10.3)	

anterior, intermediate, posterior, and panuveitis.⁴ Following the initial ophthalmic examination, patients were directed to the uveitis clinic and underwent a systematic uveitis workup by a uveitis specialist. Complete blood count, erythrocyte sedimentation rate, C-reactive protein, urine analysis, plain chest X-ray, and purified protein derivative skin test were performed for all patients. As a second step towards diagnosing the cause of uveitis, selective investigations were requested as directed by the history and the examination findings as well as by the associated systemic manifestations. These included human leukocyte antigen (HLA) typing (HLA B27, HLA B51), serum angiotensin converting enzyme level, serum lysozyme level, and antinuclear antibody level. The diagnosis of the etiology was made after fulfillment of the diagnostic criteria required for every disease, and after the seeking the consultation of an internist, a rheumatologist, a pulmonologist, a pediatrician, or a dermatologist, whenever was necessary. Cases in which the specific cause could not be determined till the end of the study duration (March 2017) were referred to as idiopathic. The study did not include the cases of posttraumatic or postoperative endophthalmitis. Data were analyzed using the statistical package for social sciences (version 20; SPSS Inc., Chicago, Illinois, USA) and the analysis was performed “by patient.”

RESULTS

The study included a total of 1315 patients: 683 patients in Upper Egypt and 632 patients in Lower Egypt. The mean age at presentation was 34.8 ± 11.9 years (range: 1–76 years) in Upper Egypt, and 32.1 ± 13.4 years (range: 1–79 years) in Lower Egypt. The Upper Egypt cohort included 359 (52.6%) male and 324 (47.4%) female patients and the Lower Egypt cohort included 343 (54.3%) male and 289 (45.7%) female patients. Uveitis was

bilateral in 43.6% of cases in Upper Egypt and 56.6% of cases in Lower Egypt. There was a statistically significant difference in the anatomical location of uveitis between both cohorts (p -value ≤ 0.05), with a higher prevalence of intermediate uveitis in the Lower Egypt cohort than in the Upper Egypt cohort. The clinical characteristics are summarized in Table 1.

In 28.7% of the Upper Egypt cohort and in 32.3% of the Lower Egypt cohort, an underlying cause or a specific uveitis entity could not be identified and the uveitis was termed idiopathic. No statistically significant difference was detected between both cohorts with respect to the proportion of idiopathic cases (p -value = 0.12). The most frequently encountered infectious etiology was ocular tuberculosis (134 of Upper Egypt cohort, 19.6% versus 68 of Lower Egypt cohort, 10.8%). Tuberculosis was significantly more prevalent among the Upper Egypt cohort compared to the Lower Egypt cohort, p -value ≤ 0.01 . This was followed among the Upper Egypt cohort by ocular toxoplasmosis (37, 5.4%), but followed among the Lower Egypt cohort by ocular toxocariasis (30, 4.7%). On the other hand, the most commonly encountered noninfectious causes in both cohorts were sarcoidosis (9.4% versus 13.1% of the Upper and Lower Egypt cohorts respectively), followed by Behçet's disease (7.5% and 7.3% of the Upper and Lower Egypt cohorts respectively) and then by HLA B27-related uveitis constituting 5.7% and 6.8% of the Upper and Lower Egypt cohorts respectively. The distribution of the patients according to etiology is summarized in Table 2.

The prevalence of the various causes differed according to the anatomical location of inflammation. In the Upper Egypt cohort, out of 237 anterior uveitis cases, 36.7% were idiopathic and HLA B27-related uveitis was the most commonly found etiology (16.5%). In the same cohort, out of the 149 patients with intermediate uveitis, 51% were idiopathic, and the most commonly encountered etiology was ocular tuberculosis (22.8%). Toxoplasmosis was the most common cause of posterior uveitis (21.9%)

TABLE 2. Most common etiologies of uveitis in the Upper Egypt and Lower Egypt cohorts.

Etiology	Upper Egypt cohort No. of patients (Percentage)	Lower Egypt cohort No. of patients (Percentage)	P- value
Idiopathic	196 (28.7%)	204 (32.3%)	0.12
Tuberculosis	134 (19.6%)	68 (10.8%)	<0.01
Sarcoidosis	64 (9.4%)	83 (13.1%)	0.03
Behçet's disease	51 (7.5%)	46 (7.3%)	0.89
HLA B27-related uveitis	39 (5.7%)	43 (6.8%)	0.42
Toxoplasmosis	37 (5.4%)	18 (2.8%)	0.02
Vogt-Koyanagi-Harada syndrome	31 (4.5%)	25 (4%)	0.6
Toxocariasis	30 (4.4%)	30 (4.7%)	0.76
Herpetic anterior uveitis	28 (4.1%)	20 (3.2%)	0.89
Juvenile idiopathic arthritis	25 (3.7%)	23 (3.6%)	0.37
Parasitic anterior uveitis	0 (0%)	26 (4.1%)	
Others*	48 (7%)	46 (7.3%)	

*Others: Fuchs' uveitis syndrome, tubulointerstitial nephritis and uveitis syndrome, multiple sclerosis, acute retinal necrosis, cytomegaloviral retinitis, acute posterior multifocal placoid pigment epitheliopathy (APMPPE), systemic lupus erythematosus, serpiginous choroiditis, sympathetic ophthalmia, medication induced uveitis (bisphosphonates and topiramate).

followed by tuberculosis (18.3%). The most common cause we found in patients with panuveitis was tuberculosis (26.6%) followed by Vogt-Koyanagi-Harada disease (24.2%). In the Lower Egypt cohort, 35.5% of the 242 patients with anterior uveitis had no detectable cause, and HLA B27-related uveitis was the most commonly found etiology (17.8%). As many as 48.8% of the patients with intermediate uveitis were idiopathic and 22.2% had sarcoidosis which was the most frequently identified cause. Idiopathic cases formed 25.4% of the posterior uveitis cases, being the largest subset. This was followed by Behçet's disease as the most frequently encountered cause (17.9%). Vogt-Koyanagi-Harada syndrome (26.6%) and Behçet's disease (23.4%) were the two most common causes of panuveitis among this cohort.

Among the pediatric cohort, no specific cause was detected in 23.4% of children from Upper Egypt and in 27.8% of children from Lower Egypt. Otherwise, the leading causes detected in the Upper Egypt cohort were juvenile idiopathic arthritis (19.5%), tuberculosis (15.6%), and sarcoidosis (9.4%). And the leading causes detected in the Lower Egypt cohort were presumed parasitic anterior uveitis (22.6%), juvenile idiopathic arthritis (20%), and tuberculosis (6.1%). Other less commonly observed causes of uveitis in children were Behçet's disease, toxocariasis, Vogt-Koyanagi-Harada syndrome, toxoplasmosis, and tubulointerstitial nephritis and uveitis syndrome.

A distinctive cause of anterior uveitis noticed only among patients of the Lower Egypt cohort was presumed parasitic granulomatous anterior uveitis. This was depicted in 26 children, 24 males and two females, whose mean age was 6.8 years (range: 3.5–14.2 years). These children had unilateral (19 patients, 73.1%) or bilateral (7 patients, 26.9%), one (29 eyes, 87.9%) or 2 (4 eyes, 12.1%)



FIGURE 1. No conjunctival nodules were clinically depicted in any of them.

creamy-colored masses at or near the 6 o'clock position, rising from the angle and insinuated between the iris and the cornea, not exceeding 1 clock hour from side to side. The affected eyes showed fine and medium sized keratic precipitates and a variable anterior chamber reaction, ranging from 2+ to 4+ anterior chamber cells and flare (Figure 1). All patients had no systemic symptoms and their general examination was within normal. Stool analysis and urine microscopic examination showed no parasites in the 26 patients, and blood smears were normal except for mild eosinophilia in 17 patients (65.4%). Six patients had aspirates of the

TABLE 3. Distribution of the causes according to the anatomical location of uveitis in the Upper Egypt cohort.

Anterior uveitis (N = 237)		Intermediate uveitis (N = 149)		Posterior uveitis (N = 169)		Panuveitis (N = 128)	
Idiopathic	87 (36.7)	Idiopathic	76 (51)	Toxoplasmosis	37 (21.9)	Tuberculosis	34 (26.6)
HLA B27 –related uveitis	39 (16.5)	Tuberculosis	34 (22.8)	Tuberculosis	31 (18.3)	Vogt-Koyanagi- Harada syndrome	31 (24.2)
Tuberculosis	35 (14.8)	Toxocariasis	16 (10.7)	Behçet's disease	25 (14.8)	Behçet's disease	26 (20.3)
Viral anterior uveitis	28 (11.8)	Sarcoidosis	12 (8.1)	Idiopathic	21 (12.4)	Sarcoidosis	21 (16.4)
Juvenile idiopathic arthritis	25 (10.5)	Multiple sclerosis	11 (7.4)	Sarcoidosis	19 (11.2)	Sympathetic ophthalmia	12 (9.4)
Sarcoidosis	12 (5.1)			Toxocariasis	14 (8.3)	Idiopathic	4 (3.1)
Fuchs' uveitis syndrome	5 (2.1)			Acute retinal necrosis	9 (5.3)		
Tubulointerstitial nephritis and uveitis syndrome	3 (1.3)			CMV	6 (3.6)		
Medication related*	3 (1.3)			APMPPE	4 (2.4)		
				SLE	2 (1.2)		
				Serpiginous choroiditis	1 (0.6)		

*Two patients developed anterior uveitis and angle closure glaucoma for the first time after using Topiramate and one patient developed anterior uveitis for the first time after using alendronate. In the three patients, no other etiology was suggested by history, examination or work-up.

TABLE 4. Distribution of the causes according to the anatomical location of uveitis in the Lower Egypt cohort.

Anterior uveitis (N = 242)		Intermediate uveitis (N = 162)		Posterior uveitis (N = 134)		Panuveitis (N = 94)	
Idiopathic	86 (35.5)	Idiopathic	79 (48.8)	Idiopathic	34 (25.4)	Vogt– Koyanagi- Harada syndrome	25 (26.6)
HLA B27 –related uveitis	43 (17.8)	Sarcoidosis	36 (22.2)	Behçet's disease	24 (17.9)	Behçet's disease	22 (23.4)
Parasitic anterior uveitis	26 (10.7)	Toxocariasis	19 (11.7)	Toxoplasmosis	18 (13.4)	Sarcoidosis	19 (20.2)
Tuberculosis	24 (9.9)	Multiple sclerosis	15 (9.3)	Tuberculosis	17 (12.7)	Tuberculosis	14 (14.9)
Juvenile idiopathic arthritis	23 (9.5)	Tuberculosis	13 (8)	Sarcoidosis	15 (11.2)	Sympathetic ophthalmia	9 (9.6)
Viral anterior uveitis	20 (8.3)			Acute retinal necrosis	6 (4.5)		
Sarcoidosis	13 (5.4)			CMV	5 (3.7)		
Fuchs uveitis syndrome	5 (2.1)			SLE	3 (2.2)		
Tubulointerstitial nephritis and uveitis syndrome	2 (1.7)			APMPPE	1 (0.7)		

anterior chamber lesions which revealed a mixture of lymphocytes, polymorphic nuclear leukocytes, macrophages, and eosinophils.

The distribution of uveitis causes according to the anatomical location of uveitis is shown in Tables 3 and 4.

DISCUSSION

Epidemiological studies about uveitis give valuable clues to the commonly encountered region-specific causes, and thus aid clinicians diagnose the cause earlier and start cause-appropriate management more promptly. Moreover, apart from the racial and ethnic influence on the prevalence of some causes of uveitis over others, changes in the environment and lifestyle may lead to changes in the prevalence of uveitis causes within the same country or geographic region over time, making periodic update of the epidemiologic data also important.⁵

The mean age at presentation in the present study was 34.8 ± 11.9 years in the Upper Egypt cohort, and 32.1 ± 13.4 years in the Lower Egypt cohort, and 69.3% and 71.5% of the patients were in the 18–45 year group in both cohorts respectively, in accordance with previous reports indicating that uveitis is most common among the working-age population.^{6–9} Pediatric patients constituted 18.7% of the cases in Upper Egypt and 18.2% of the patients in Lower Egypt. These percentages seem higher than most estimates from previous studies.^{10–12} This may be in part due to the widespread practice adopted by pediatric rheumatologists in Egypt of referring asymptomatic children with systemic disease especially juvenile idiopathic arthritis and Behçet's disease for uveitis screening. Another factor which the authors believe may contribute to the higher frequencies of pediatric cases in the present study is the relatively low socioeconomic state of the country. Parents of sick children can seek medical service funded by the school insurance program, whereas a sector of the adult population in the country has no access to the insurance system.

There was a slight male predominance in the present study, with male patients representing 52.6% and 54.3% of the Upper and Lower Egypt cohorts respectively. This finding of male predominance is similar to other works from developing countries^{13,14} and stands in contrast to a number of studies from developed countries which reported either equal gender distribution¹⁵ or slight female predominance¹⁶, explaining the latter finding by the greater prevalence of chronic disease in women. On the other hand, Consul et al¹⁷ suggested that in developing countries, men tend to seek medical attention more promptly than women.

In the current study, anterior uveitis was the most common anatomical type in both cohorts, constituting

approximately 34.7% and 38.3% of the Upper and Lower Egypt patients respectively. This finding is compatible with other studies.^{7,18}

Bilateral uveitis constituted 56.6% and 43.6% of the Upper and Lower Egypt groups respectively. the higher incidence of bilaterality in Upper Egypt patients might be attributed due to the relative paucity of primary and secondary ophthalmic care centers in Upper Egypt compared to Alexandria, with a subsequent referral bias to the Upper Egypt tertiary referral center, to which the more severe entities of uveitis, including bilateral cases, are readily referred for further management.

The results of the present study showed that for 71.3% and 67.7% of the Upper and Lower Egypt participants, a specific diagnosis was found based on history that included a review of systems, a detailed ophthalmic examination, and selected investigations. Similar findings were observed in other studies.⁷

In both groups of our patients, the percentage of idiopathic patients varied according to the site of inflammation, being highest among patients with intermediate uveitis (51% in the Upper Egypt cohort and 48.8% in the Lower Egypt cohort). Previous studies also showed that the largest subset of intermediate uveitis cases were idiopathic.^{1,7} However, apart from intermediate uveitis, there was a remarkable discrepancy among different studies regarding the proportion of idiopathic cases among other forms of uveitis.¹ In our study, anterior uveitis was idiopathic in 36.7% and 35.5% of the Upper and Lower Egypt groups, but 25.4% of posterior uveitis cases were idiopathic in the Lower Egypt series versus only 12.4% in the Upper Egypt series. Conversely, 9.4% of panuveitis cases were idiopathic in the Upper Egypt group versus only 5.3% in the Lower Egypt group. The most common specific cause of intermediate uveitis in our series was tuberculosis in Upper Egypt (22.8%) and sarcoidosis in Lower Egypt (22.2%).

In the present study, the most common specific diagnoses were tuberculosis, sarcoidosis, Behçet's disease, HLA B27-related uveitis, toxoplasmosis, juvenile idiopathic arthritis, toxocariasis, and Vogt-Koyanagi-Harada syndrome. These diseases, however, represented different proportions of each anatomic category of uveitis in both cohorts of participants.

Tuberculosis was the most common identifiable cause in the Upper Egypt cohort, accounting for 19.6% of all cases collectively, and for 26.6% of panuveitis cases, among whom tuberculosis was the most common diagnosis. On the other hand, tuberculosis was identified in only 10.8% of all the Lower Egypt cases collectively, and among patients of panuveitis, it was depicted in 14.9% of the cases only, with VKH syndrome, Behçet's disease, and sarcoidosis being found in higher numbers. These alarming rates of ocular tuberculosis agree with what other studies have shown that tuberculosis is now re-emerging

worldwide, possibly because of an increase in human immunodeficiency virus-infected population..¹⁹ We assume that the higher proportion of tuberculosis among the Upper Egypt cohort than among its Lower Egypt counterpart may be in part due to the higher prevalence of the habit of smoking "Shisha" in Upper Egypt in general, because in smoking Shisha, the mouthpiece used is usually shared among a large number of smokers without inter-user disinfection.

Sarcoidosis was an important cause of uveitis in the present study, depicted in 9.4% of the patients of the Upper Egypt cohort collectively, and in 13.1% of the patients of Lower Egypt. All but 8 of the 64 affected Upper Egypt patients and 6 of the 68 affected Lower Egypt patients had positive biopsy. The most common biopsy sites were the lymph nodes followed by the skin lesions, and three patients had liver biopsy. The cases without histopathological support had patterns of uveitis compatible with the diagnosis, with compatible systemic manifestations, a high serum angiotensin converting enzyme, a high serum lysozyme, a negative tuberculin test, and an agreement on the diagnosis with the treating internist. The percentages of contribution of sarcoidosis to uveitis in both cohorts in our study lie within the range mentioned by other studies.^{7,10,19–21}

Behçet's disease was another important identifiable specific diagnosis in our study, detected in 7.5% and a similar 7.3% of all patients in the Upper Egypt and Lower Egypt groups, and accounting for 20.3% and 23.4% of panuveitis patients in both cohorts respectively. This finding agrees with the observation of the geographical distribution of Behçet's disease in countries located along the ancient Silk Road.^{7,22} The contribution of Behçet's disease to uveitis patients in our study lies within the range of percentages reported by studies from other Middle Eastern countries Al Dhahri H et al²³ and Hamade IH et al²⁴ from Saudi Arabia reported that Behçet's disease was present in 8.4% and 6% of their patients respectively. Kianersi F et al²⁵ from Iran reported that the disease was present in 10.5% of their patients, whereas reports from Iraq²⁶ and Lebanon²⁷ mentioned 8.2% and 12.8% prevalence of Behçet's disease among their patients, respectively. A higher prevalence of the disease among patients with uveitis has been reported by studies on Turkish cohorts.^{5,28} Lower frequencies have been reported from Western countries where the disease is an uncommon cause of uveitis.^{21,29}

HLA B27-positive acute anterior uveitis was another well recognized entity in our series. It occurred in 16.5% and 17.8% of anterior uveitis cases in the Upper Egypt and Lower Egypt groups respectively. This rate is not far from that observed in studies from USA^{1,19} and Southern Europe³⁰, but lower than that observed in some studies from Northern Europe^{20,31} and yet higher than that reported in studies from Japan.³² This variation may be attributed to racial

difference in the prevalence of HLA B27 in the general population. Other important causes of anterior uveitis in our study were herpetic anterior uveitis (11.8% and 8.3% of patients with anterior uveitis in the Upper and Lower Egypt cohorts respectively) and juvenile idiopathic arthritis related uveitis (10.5% and 9.5% of patients with anterior uveitis in the Upper and Lower Egypt cohorts respectively). Contrary to the Upper Egypt series, 26 children from the Lower Egypt series presented with ocular features resembling trematode-induced granulomatous uveitis described by Rathinam et al.³³ The affected children were residents of the following governorates of Lower Egypt: Al Bohaira (12 patients, 46.2%), Al Sharkeya (5 patients, 19.2%), Al Gharbeya (5 patients, 19.2%), and Al Menoufeya (4 patients, 15.4%). After an initial attempt of management in primary and secondary ophthalmic care institutes in their governorates, they were referred for more definitive management in the tertiary eye care hospital in Alexandria, one of the two referral hospitals participating in the current study. All patients gave clear history of bathing in canals and ponds, which are prevalent in several areas of these primarily agricultural governorates. Interestingly, none of them was a resident of Alexandria itself, a coastal non-agricultural city, the residents of which are not known for this kind of habit.

The results of our study, consistent with those of previous studies, illustrated that ocular toxoplasmosis was a leading cause of infectious posterior uveitis in both our cohorts. Nevertheless, in our series, 22.8% versus only 13.4% of the cases of posterior uveitis were attributed to ocular toxoplasmosis in the Upper and Lower Egypt cohorts respectively. Similar rates have been reported by other studies.⁵ The disease is more prevalent in developing countries as in South America, Africa, and India due to poor hygienic and dietary habits.^{14,22,34} And in our study, we suggest that the discrepancy between the percentage of patients affected by toxoplasmosis in the Upper Egypt and the Lower Egypt cohorts may be attributed to the same reason, as the socioeconomic status, the availability of a clean water supply in every house and hence the hygienic standards in Alexandria exceed those in Upper Egypt, still a relatively underprivileged part of the country. A similar regional variation in the incidence of ocular toxoplasmosis within the same country has been reported by studies from India.³⁵

VKH disease, which is known to be more prevalent in darkly pigmented races than in Western countries, was in our study the most common cause of panuveitis in the Lower Egypt cohort (26.6%) and the next most common cause of panuveitis in the Upper Egypt cohort (24.2%), surpassed only by tuberculosis which prevailed in the latter cohort. These percentages were within the range mentioned by other studies from Asia and Tunisia (15–51%).^{7,24,35}

In summary, the present study, although may have referral bias, being executed in tertiary eye care institutes, highlighted the relatively high numbers of uveitis patients

with tuberculosis. This may change a few years later as in Egypt, there is now a national program under the patronage of the WHO to implement DOTS (Directly Observed Treatment, Short course) where the patients receive treatment on day-to-day basis under the direct supervision of health care professionals in governmental hospitals specialized in TB, in order to improve compliance and cure rates. Sarcoidosis, Behçet's disease, HLA B-27 positive uveitis, ocular toxoplasmosis, and VKH disease were other important causes in our series. Presumed parasitic granulomatous anterior uveitis was among the specific entities in the Lower Egypt cohort, whereas no similar cases were found in the Upper Egypt cohort.

Future multicenter epidemiological studies are needed to better demonstrate the variation of uveitis pattern and the factors underlying this variation, among the different Egyptian governorates as well as to identify changes in the causative pattern of uveitis among the Egyptian population with time and to update the ophthalmologists with the most important differential diagnosis to put in mind in the different societies within this densely populated developing country.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

FINANCIAL DISCLOSURE

Neither author has a financial or proprietary interest in any material or method mentioned.

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