

PEDIATRIC UVEITIS: EXPERIENCE IN COLOMBIA

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ABSTRACT

Purpose: To describe the clinical features of uveitis in children treated at two ophthalmological centers in Bogotá, Colombia, in a 13 year-period.

Methods: Retrospective observational clinical record review of pediatric children with diagnosis of uveitis.

Results: 310 children were evaluated, 51.9% were female, mean age of 10.1 years. Posterior uveitis was the most common location (58.7%), of insidious onset (87.4%) and chronic course (78.1%). The most common etiology was infectious (58.4%) caused by toxoplasmosis (76.8%). There was a statistically significant difference in visual acuity between anterior (20/68) and intermediate uveitis (20/70), compared to posterior uveitis (20/434) ($p < 0,05$).

Conclusions: This is the first study to report the clinical features of pediatric uveitis in Colombia, where infectious etiologies are the leading cause. It will improve awareness and knowledge of pediatric uveitis in developing countries, and contribute to the development of public health policies of pediatric visual health.

INTRODUCTION

Uveitis is an intraocular inflammatory process that can affect all structures of the eye; if early diagnosis and correct treatment are not carried out, it can lead to severe visual impairment ¹⁻³. The main causes of this condition include infectious, autoimmune and idiopathic processes ^{2,4,5}. Uveitis in children is considerably less frequent than in other age groups (5-10 times less frequent than in adults), and it is a challenge for the ophthalmologist to diagnose and to manage this disease, since it may present late and attention is usually requested only when obvious signs of visual impairment are present ^{1,6,7}.

The prevalence of pediatric uveitis is approximately 30 cases per 100,000 with an annual incidence between 4.3 and 6.9 per 100,000 ^{4,8}. Its etiology varies according to environmental, socioeconomic and demographic factors ^{4,8}. The most common anatomical location is anterior uveitis ^{5,8}. In developed countries it is highly associated with juvenile idiopathic arthritis ⁸⁻¹¹. In developing countries, posterior uveitis is an important cause of uveitis in children; its main cause is ocular toxoplasmosis ^{8,12-15}.

In Colombia, the only study reporting the epidemiology of uveitis is a retrospective study conducted between 1996 and 2006, which included 693 adult patients with uveitis having an average age of 31.7 years ¹⁶. It was found that posterior uveitis was the most common location and that 39.8% of cases were due to ocular toxoplasmosis. To our knowledge, there are no epidemiological studies of uveitis in Colombian children. The aim of this study was to describe the clinical features of uveitis in pediatric patients treated at two ophthalmological centers in Bogotá, Colombia, in a 13 year-period between January 2000 and July 2013.

MATERIALS AND METHODS

Retrospective, observational, descriptive study of pediatric patients diagnosed with uveitis at Fundación Oftalmológica Nacional and at the Uveitis Clinic from Rosario University in Bogotá, Colombia, between January 2000 and July 2013. Patients from 0 to 18 years old with a diagnosis of uveitis were selected from patients' databases of both centers. The study adhered to the Declaration of Helsinki and was approved by the Ethics Committee of the Fundación Oftalmológica Nacional. Inclusion criteria were: 1) Patient age under 18 years old (range 0-18 years), 2) Diagnosis of uveitis. Medical records with incomplete data were excluded. Recorded data included patient age, sex, affected eye, past medical, social and family history, ophthalmic examination and complete information regarding uveitis (anatomical localization, onset, duration, course,

etiology, ancillary tests, treatment and complications). Uveitis was classified according to the “Standardization of Uveitis Nomenclature (SUN)” criteria for reporting clinical data (16). Snellen’s BCVA was converted to logMAR acuities for data analysis. Acuities unable to be assessed with Snellen charts were converted using the following convention: count fingers (CF) 20/2000; hand motions (HM) 20/20,000; and light perception (LP) 20/200,000. For pediatric patients in whom visual acuity was determined by binocular fixation preference (BFP), it was rounded to Snellen using the following convention: central, steady and maintained (CSM) was converted to visual acuity better than 20/50; no central, no steady and no maintained to worse than 20/200; and the patients that had only one of the criteria (central, steady or maintained) were classified as visual acuity between 20/50 and 20/200 by Snellen. This group of patients evaluated by BFP was not included for the quantitative mean visual acuity analysis (table 4) because, to our knowledge, there is no system for the exact conversion to Snellen equivalent. Data were analyzed with SPSS statistics program 21 (ser. 572 110 343). A p value ≤ 0.05 was considered statistically significant.

RESULTS

A total of 838 clinical records were reviewed, 328 from the Fundación Oftalmológica Nacional and 510 from the uveitis Clinic from Rosario University. 310 patients met the inclusion criteria (463 eyes). One hundred and sixty-one patients were female (51.9%) and one hundred and forty nine were male (48.1%). The mean patient age was 10.1 ± 5.3 years (range 0-18 years), 157

(50.6%) were unilateral, posterior uveitis was the most common anatomical location (n=182, 58.7%), followed by intermediate uveitis (n=51, 16.5%), anterior uveitis (n=44, 14.2%), and panuveitis (n=33, 10.6%) (Figure 1). Most cases of anterior and posterior uveitis were unilateral (68.2% and 62.1% respectively), while intermediate uveitis and panuveitis were bilateral (82.4% and 84.8% respectively). Onset was insidious in 87.4% of the cases (n=271) (Table 1).

The most common etiology was infectious (58.4%), for which toxoplasmosis was the leading cause (76.8%), followed by toxocariasis (17.7%). The second most frequent etiology was idiopathic (34.2%), followed by uveitis secondary to trauma (3.5%), juvenile idiopathic arthritis (1.9%), Vogt-Koyanagi-Harada syndrome (1%), spondyloarthropathies (0.3%), and sarcoidosis (0.3%) (Table 1). Uveitis associated with a positive HLA-B27 corresponded to 1% of the cases (n=3). Autoimmune disease was present in 3.5% of the cases (11 patients). A noninfectious etiology (excluding traumatic and post-surgical uveitis) was found in 37.7% of cases (n=117). Gender distribution in the three most common causes (toxoplasmosis, toxocariasis and idiopathic) was similar between groups.

The most common cause of anterior uveitis, intermediate uveitis and panuveitis was idiopathic, with 31 (70.5%), 44 (86.3%) and 20 cases (60.6%) respectively. In contrast, the most common cause of posterior uveitis was toxoplasmosis (n=137, 76.4%). Bilateral involvement was found in 46% (n=64) of the

toxoplasmosis cases, and 12.5% (n=4) cases of toxocariasis. Most of the idiopathic uveitis showed bilateral involvement (n=71, 67.0%) (Table 1).

Of 373 eyes with quantitatively reported visual acuity (excluding binocular fixation preference testing), an average visual acuity of 20/195 by Snellen (LogMAR 0.99 ± 1.1) was found. There was a statistically significant difference in visual acuity between anterior (Snellen 20/68, LogMAR 0.53 ± 0.8 ; 95% CI -1.25 to -0.36; $p < 0.05$) and intermediate uveitis (Snellen 20/70, LogMAR 0.54 ± 0.6 ; 95% CI -1.16 to -0.43; $p < 0.05$) compared to posterior uveitis (Snellen 20/434, LogMAR 1.33 ± 1.2). Patients with panuveitis presented with lower visual acuity compared with anterior and intermediate locations (Snellen 20/208, LogMAR 1.01 ± 1.1 ; 95% CI -0.07 to 1.04; $p < 0.05$); this difference was not statistically significant (Table 2).

Out of the 465 eyes with uveitis of any etiology and localization, 431 had reported visual acuity. We found that 42.5% (n=183) had visual acuity less than or equal to 20/200, 16.0% (n=69) had visual acuity between 20/50 and 20/200, and 41.5% (n=179) had visual acuity better or equal to 20/50 (Table 3). According to the World Health Organization, based on International Statistical Classification of Diseases (ICD-10), moderate visual impairment is considered visual acuity between 20/60 and 20/200, severe visual impairment is visual acuity less 20/200, and blindness corresponds to visual acuity less than 20/400^{17,18}. The percentage of patients with unilateral or bilateral blindness was 32.6% and 6.1%, respectively (n=101 and 19 eyes) (Table 4).

The treatment received by the patients included topical steroids in 42.6% (n=132), systemic steroids in 19.4% (n=60), systemic immunomodulators in 13.9% (n=43), subconjunctival steroids in 8.1% (n=25), and intravitreal steroids in 1% (n=3). Systemic anti-infective agents were used in 31.2% (n=97) of the cases.

The most frequent complications by patient were chorioretinal scars in 44.5% (n=138), unilateral blindness in 32.6% (n=138), posterior synechiae in 13.5% (n=42), retinal detachment in 9.4% (n=29), bilateral blindness in 6.1% (n=19), glaucoma in 5.2% (n=16), macular edema in 3.5% (n=11), and band keratopathy in 3.5% (n=11) (Table 4).

DISCUSSION

In this study we found that posterior uveitis was the most common anatomical location of uveitis in children (58.7%), secondary to infectious processes (toxoplasmosis 76.8% and toxocariasis 17.7%). Although this is consistent with previous descriptions in the literature for developing countries, it contrasts with that reported in a systematic review by Nagpal et al, where countries in North America, Europe, Asia and Africa are included, in the United States by Smith et al and Kump et al, and in the Netherlands by Boer et al, who found that the most frequent location was anterior uveitis (Table 5)^{3,4,6,8,19-21}.

In the only study of uveitis in adults in Colombia reported in the literature, it was also found that posterior uveitis was the most common anatomical location, caused mostly by toxoplasmosis (39.8%)¹⁶. This shows once again that, in developing countries, environmental factors such as exposure to contaminated water and food should be taken into account, as these infections are present not only in adults, but also in the pediatric population.

The most common cause of anterior uveitis, intermediate uveitis and panuveitis was idiopathic, which is also similar to results previously reported¹⁶. This indicates that the analyzed sample of the Colombian population is homogeneous when evaluating the causes of uveitis, regardless of the age group.

We noted that uveitis secondary to juvenile idiopathic arthritis was found in only a small percentage of the patients (1.9%), since other studies such as that conducted in the Netherlands by Boer and colleagues found that 29% of patients had an associated systemic disease, of which juvenile idiopathic arthritis was the most frequent, corresponding to 30% of cases^{3,9,10}.

In this study, visual acuity was related to the location of uveitis, having a statistically significant decrease in cases of posterior uveitis compared to other locations. Since the most frequent location in pediatric patients is posterior uveitis, early diagnosis associated to prompt and appropriate treatment is imperative in order to improve visual outcomes in these patients. As in previous

studies, we also found that children have poorer visual outcomes than adults ²², with 55.39% cases of severe unilateral visual impairment or blindness, and 19.85% of bilateral severe visual impairment or blindness. This could be related to delayed diagnosis and the likelihood of developing a greater number of complications in the pediatric population ^{8,22}.

Noninfectious uveitis (excluding traumatic and post-surgical uveitis) was present in 37.7 of all cases (n=117). Of these, 34.18 (n=40) were treated with systemic immunomodulators, which is low compared to what was expected since treatment with systemic immunomodulatory therapy is crucial to modify the course of the disease, improve prognosis, and prevent complications in these cases ²². This can be explained by the lack of early referral to the uveitis specialist and the difficulty of access to treatment due to the health system in our country. This could also be one of the reasons why the visual acuity is reduced significantly in this group of pediatric population.

Pediatric uveitis is a diagnostic and therapeutic challenge for the ophthalmologist. This entity has a lot of relevance in the pediatric population because, without a prompt diagnosis and treatment, it generates significant visual loss in children. Additionally, children tend to have a higher rate of complications compared to adults because of the difficulty in early diagnosis (absence of verbal complaints, difficulty in ophthalmic examination and in following treatment recommendations), and because of the limited medical and surgical treatment options ⁸. The most

frequently reported complications include cataract, glaucoma, band keratopathy, cystoid macular edema, among others^{8,22-24}.

This study reports the clinical features of uveitis in the pediatric population in Colombia. It is limited by its retrospective observational design, the lack of certain data in some of the cases, as well as the fact that patients were seen in the same city. Nevertheless, it is the first report of uveitis in Colombian children. It will improve the knowledge of uveitis in our environment, and can be an instrument in the development of public policies for the Colombian pediatric population in order to optimize treatment outcomes for these patients.

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DECLARATION OF INTEREST

The authors report no conflicts of interest.

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