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Pediatric uveitis: a retrospective analysis at a tertiary eye care hospital in South India

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Abstract

Purpose: To analyze the demographics, etiology, complications, treatment modalities, and visual outcomes in pediatric uveitis patients at a tertiary eye care hospital.

Methods: A retrospective review of medical records of pediatric uveitis patients who presented with us from January 2014 to January 2020 was evaluated.

Results: Out of the 178 pediatric uveitis patients, 65 children were included in the study. The most common age group was 6–10 years (46%). Of the included patients, 36 (55.4%) were male and 29 (44.6%) were female. Presentation was bilateral in 39 (60%) and unilateral in 26 (40%). Anterior uveitis was seen in 19 (29.23%), intermediate in 18 (27.69%), posterior in 16 (24.62%), and panuveitis in 12 (18.46%) patients. There were 2 cases of masquerades. Non-infectious uveitis was the most commonly seen, in 48 (73.84%) of total cases, among which 21 (43.75%) were idiopathic and 7 (14.58%) were associated with juvenile idiopathic (JIA) arthritis. Infectious uveitis was present in 17 (26.15%); the most common etiology was toxoplasmosis. Baseline visual acuity was low in 22 (33.84%) children. After initiating treatment, 37 (56.92%) showed improvement in vision and 10 (15.38%) had worsening of vision. Intraocular pressure (IOP) rise was seen in 5 (7.69%) children; 51 (78.46%) children required medical management and 16 (24.61%) children required surgical intervention; 46 (70.76%) children had uveitis related complications out of which most of them 30 (65.21%) were present at baseline.

Conclusions: Anterior and intermediate uveitis were the most common types observed in our study. Toxoplasmosis was the most common type of infectious uveitis and JIA the most common cause in non-infectious type apart from idiopathic uveitis. Posterior uveitis had low visual acuity at baseline and follow-up. Children presented to us with poor visual acuity and complications at baseline, hence an early referral to a tertiary eye hospital and management accordingly can improve the quality of vision and visual rehabilitation.

Keywords: pediatric infectious uveitis, pediatric non-infectious uveitis, pediatric uveitis

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Introduction

Uveitis is a group of inflammatory disorders having components of both systemic immune-mediated and infectious processes localized to the eye.[1] Pediatric uveitis accounts for only 2–14% of cases presenting to uvea clinic, but causes significant ocular morbidity.[2] The challenges in diagnosing and managing these cases are due to the asymptomatic nature of the disease and late presentation with significant complications. The inability of the child to convey the problem, poor co-operation during the examination, noncompliance to treatment, and a very long follow-up further add to this.[2]

Non-infectious uveitis accounts for 69–95% of pediatric uveitis. Though 23% of cases have an etiological co-relation, idiopathic cases account for almost 77% of the cases.[3] The current treatment for pediatric uveitis includes corticosteroids (topical, intravitreal, periorbital, and systemic) and immunomodulatory agents and surgical intervention for cataract, glaucoma, and vitreo-retinal related complications. For infectious

etiologies, antituberculosis, antibiotics, antiviral, and antihelminthic treatments are required.[4] In this retrospective study, we evaluated the patient demographics, etiology, diagnosis, treatment, visual outcome, and complications in pediatric uveitis from a cohort of children seen at a tertiary care center at Bangalore, South India.

Materials and methods

Clinical records of patients presenting to the uvea clinic at Sankara Eye Hospital Bangalore, South India from 2 January 2014 to 2 January 2020 were reviewed. Inclusion criteria were: children who were below 18 years of age and diagnosed with uveitis. Exclusion criteria were: all uveitis cases above 18 years of age, those who were diagnosed with traumatic uveitis and whose follow-up was less than 3 months. To assess the systemic cause, the pattern of uveitis, disease evolution, and treatment response with a minimum follow-up of 3 months are required, hence children with less than 3 months follow-up and those with traumatic uveitis were excluded. The study protocol was approved by the Institutional Ethics Committee and the study adhered to the tenets of the Declaration of Helsinki (ID of the committee: ECR/705/Inst/KA/2015/RR-18). Informed consent was obtained from all individual participants included in the study. Informed consent was also obtained from the parent or the guardian of the children who were included in our study.

The data were reviewed for patient demographic information, sex, age at presentation, systemic history, laterality, nature of onset, and the number of following visits. Clinical information, including diagnosis, location of uveitis based on SUN criteria[5] and chronicity of uveitis, best-corrected visual acuity (BCVA), intraocular pressure (IOP), and complications at the baseline visit, 3 months, 6 months, 1 year, and 3 years, was recorded. Visual acuity testing for children 6 months to 1 year was recorded by central, steady, maintained fixation (CSM) or Teller and Cardiff acuity cards, for 2- to 3-year-old children with Snellen picture chart and above 3 years with the Snellen chart. The data of ocular investigations, such as optical coherence tomography, fundus fluorescein angiography, ultrasound B scan, and ultrasound biomicroscopy, were retrieved and analyzed. The details of systemic investigations including complete blood cell count and differential count, erythrocyte sedimentation rate, complete urine analysis, tests for infectious uveitis tuberculin skin test (TST), treponema pallidum hemagglutination test (TPHA), enzyme-linked immunosorbent assay (ELISA) for toxoplasmosis, human immunodeficiency virus (HIV), tests for non-infectious uveitis anti-neutrophil antibody (ANA), rheumatoid factor (RA), anti-dsDNA, human leukocyte typing antigen (HLA), and serum angiotensin-converting enzyme (ACE) levels were noted.

Data of children who were managed with topical, periocular, and intravitreal/oral steroids, and immunomodulatory therapy, and those who underwent surgical procedures that included EDTA chelation for band-shaped keratopathy (BSK), cataract surgery with IOL implantation, glaucoma, and vitreoretinal procedure were recorded. The children having systemic involvement and those on immunomodulatory therapy were treated in accordance with the pediatrician.

Statistical methods

All statistical analyses were done using Minitab Software (Minitab® 17.1.0). Distributions were summarized using proportions, means ± standard deviation (SD), or medians as appropriate. The normality of the quantitative data was checked by the Kolmogorov–Smirnov test.

Results

Demographics

Out of the 178 children who came to the uvea clinic from January 2014 to January 2020, 65 children were included in the study. The 2 masquerades were not included in the statistical analysis. There were 36 (55.4%) males and 29 (44.6%) females. The mean age at presentation was 10.18 ± 4.36 years (range = 2–18 years), with 9 (14%) children in the age group of 0–5 years, 30 (46%) in 6–10 years, and 26 (40%) in 11–18 years; bilateral presentation in 39 (60%) and unilateral in 26 (40%). A total of 104 eyes were studied in the cohort of 65 children. Among the 19 cases of anterior uveitis (28 eyes), 6 cases (12 eyes) of juvenile idiopathic arthritis (JIA) and 3 cases (6 eyes) of post pyrexial uveitis were bilateral. HLA-B27, viral uveitis, idiopathic uveitis, and Fuchs' constituted 10 cases (10 eyes) which were unilateral. Among the 18 cases of intermediate uveitis (36 eyes), all were bilateral

and had a similar presentation of the disease in both eyes. Among the 16 cases of posterior uveitis (19 eyes), 1 case (2 eyes) of TB neuroretinitis and 2 cases (4 eyes) of rickettsial neuroretinitis were bilateral with a similar presentation in both eyes. Posterior parasitic infections and idiopathic vasculitis accounted for 13 cases (13 eyes) that had a unilateral presentation. Among the 12 cases of panuveitis (22 eyes), 1 case of sarcoid (2 eyes), 1 case of Behcet's (2 eyes), 3 cases of VKH (2 eyes), and 5 cases of idiopathic panuveitis (10 eyes) had a bilateral presentation with the similar manifestations in both the eyes. The follow-up ranged from 3 months to 3 years with 27 children having a minimum follow-up of 3 months and 21 children having a maximum follow-up to 3 years. The mean follow-up of the whole group was 15.74 months. The mean follow-up of the non-infectious group was 24.19 months.

Etiology and location

Out of the 65 children, considering the location of uveitis at presentation, 19 (29.23%) were anterior uveitis, 18 (27.69%) intermediate uveitis, 16 (24.62%) posterior uveitis, and 12 (18.46%) panuveitis. Etiology as infectious accounted for 26.15% (17) among the total number of cases and non-infectious 73.84% (48). Further among the infectious, 11 were parasitic, 2 viral, 2 tuberculosis, and 2 rickettsial neuroretinitis. The infectious etiology was most common in the posterior uveitis with 7 cases diagnosed with toxoplasma retinochoroiditis; 32.3% of the total number of cases were idiopathic. Two children tested Mantoux positive, the serum ACE levels of 3 children were elevated, 1 child had RA positive, 7 children had toxoplasma IgG/IgM positive, 2 children had Weil–Felix test positive, 4 children tested HLA-B27 positive, and 1 child tested HLAB5 positive. Seven children were diagnosed with JIA by the treating pediatrician based on systemic features. Table 1 shows the detailed outlay of etiology and location of involvement.

Visual acuity and IOP

Baseline visual acuity was low in 22 (33.84%) children, 37 (56.92%) children had improved visual acuity after initiation of treatment, and 10 (15.38%) children had worsening of visual acuity despite treatment. Posterior uveitis accounted for the majority of children with poor vision.

Complications

Among the 65 cases, 46 (70.76%) children were observed to have a complication, 30 (65.21%) at the time of presentation as shown in Figure 1, and 16 (34.78%) during the follow-up. The anterior uveitis cases accounted for the maximum number, 17 (36.9%), of complications. Cataract was the most common in both anterior uveitis and panuveitis, cystoid macular edema (CME) in intermediate uveitis, glaucoma in anterior and intermediate uveitis, and BSK in anterior uveitis. The most common complication in anterior uveitis was cataract (29.4%), followed by glaucoma, band-shaped keratopathy, and posterior synechiae (17.64% each), and the least common was CME (only 12.5%). CME along with glaucoma accounted for 25% of complications and cataract for 16.6% in intermediate uveitis. The incidence of CME was 10.76%. Tractional retinal detachment was most common among posterior uveitis (44.44%), followed by macular scar (22.22%). Cataract was noted in 33.33% of panuveitis cases followed by CME (22.2%). On follow-up, glaucoma was increasingly seen in anterior and intermediate uveitis. This pattern in our study could be due to many of the children having steroid-induced glaucoma. Table 2 shows the type and location of complications.

Recurrences

Here, 9 children showed recurrence at 6 months follow-up, 13 at 1-year follow-up, and 4 at 3 years follow-up. HLA-B27 associated anterior uveitis and idiopathic intermediate uveitis cases accounted for most of the cases at 6 months, 1 year, and 3 years follow-ups.

Among the infectious uveitis, 2 cases of viral anterior uveitis and 2 cases of toxoplasma retinochoroiditis had recurrences at 6 months and 1 case of TB intermediate uveitis had recurrence at 1 year. Among the non-infectious uveitis, 3 cases of HLA-B27 and anterior uveitis had recurrences at 6 months, 1 year, and 3 years. Two cases of sarcoid-associated intermediate uveitis had recurrence at 1 year. Other cases that had recurrences at 1 year and 3 years were idiopathic intermediate uveitis and panuveitis.

Medical management

Topical steroids were the mainstay of treatment in 57 children. Oral medications in the form of steroids were used in 54 children; 16 children

Table 1. Location and etiology of pediatric uveitis.

Criteria	Anterior uveitis		Intermediate uveitis		Posterior uveitis		Panuveitis		Total
	n	%	n	%	n	%	n	%	n
Total	19	29.23	18	27.69	16	24.62	12	18.46	65
Infectious versus non-infectious									
Infectious	2	10.53	1	5.56	13	81.25	1	8.33	17
Non-infectious	17	89.47	17	94.44	3	18.75	11	91.67	48
Etiology									
JIA	6	31.58	1	5.56					7
HLA-B27	3	15.79					1	8.33	4
Idiopathic	4	21.05	12	66.67			5	41.67	21
Viral	2	10.53							2
Fuchs'	1	5.26							1
Post pyrexial	3	15.79							3
TB			1	5.56	1	6.25			2
Sarcoid			2	11.11			1	8.33	3
IgA nephropathy			1	5.56					1
RA positive			1	5.56					1
Vasculitis					3	18.75			3
Toxoplasma retinochoroiditis					7	43.75			7
Cysticercosis					1	6.25			1
Rickettsial					2	12.50			2
Toxocara					1	6.25			1
Ophthalmomyiasis interna					1	6.25			1
VKH							3	25.00	3
DUSN							1	8.33	1
Behcet's b5, b51							1	8.33	1

DUSN, diffuse unilateral subacute neuroretinitis; JIA, juvenile idiopathic arthritis; RA, rheumatoid arthritis; TB, tuberculosis; VKH, Vogt–Koyanagi–Harada.

received oral steroids along with specific therapy according to etiology such as antibiotics, antivirals, anti-toxoplasmosis drugs, anthelmintics, and anti-tuberculosis (ATT) as mentioned in Table 3.

Medical management of infectious uveitis. Among the 17 cases of infectious uveitis, 2 children diagnosed with rickettsia neuroretinitis were given doxycycline; 2 children with anterior viral uveitis received oral antiviral; 1 child received oral antifungal for oral candidiasis due to the side-effects of methotrexate; 5 children with toxoplasma retinochoroiditis received anti-toxoplasmosis drugs; 4 children received anthelminthic drugs, out of which 1 child was diagnosed with diffuse unilateral subacute neuroretinitis (DUSN), 1 child with ophthalmomyiasis interna, 1 child with toxocariasis, and 1 child with cysticercosis; 2 children

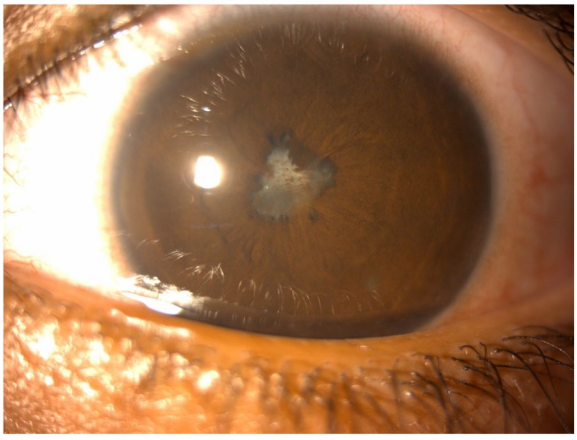

Figure 1. Complicated cataract and posterior synechiae.

received anti-tuberculosis (ATT); and 1 child suspecting miliary tuberculosis and another child whose TST was positive when screening for TB were done before starting biologics. Further intravitreal treatment in the form of clindamycin injection was given to 1 child with active toxoplasma retinochoroiditis close to the fovea. One child diagnosed with ophthalmomyiasis interna laser photocoagulation was done around the maggot.

Medical management of non-infectious uveitis. One child received intravenous methylprednisolone (IVMP) for 3 days for disc edema with exudative retinal detachment associated with Vogt–Koyanagi–Harada disease (VKH).

Immunomodulatory therapy was added for children to prevent the side-effects of systemic steroids such as the suppression of hypothalamic–pituitary axis leading to delay in pubertal growth.[6] In total, 25 children were started on IMT therapy and 5 on biologics, 17 of them were on a single drug, 6 on double-drug regime, and 2 on triple-drug regime. Methotrexate (MTX) was the most common single drug used in 14 children followed by mycophenolate mofetil (MMF) in 2 and azathioprine (AZT) in 1 child. Combination therapy with two drugs (MTX and MMF) was given to 2 children, MTX with AZT in 1 child, and MTX along with every 2 weekly subcutaneous adalimumab was given to 3

Table 2. Distribution of pediatric uveitis complications.

Complications	Anterior uveitis		Intermediate uveitis		Posterior uveitis		Panuveitis		Total	
	n	%	n	%	n	%	n	%	n	%
Total	17	36.96	12	26.09	8	17.39	9	19.57	46	
Type										
Cystoid macular edema	2	11.76	3	25.00			2	22.22	7	15.22
Band-shaped keratopathy	3	17.65	1	8.33					4	8.70
Posterior synechiae	3	17.65							3	6.52
Cataract	5	29.41	2	16.67			3	33.33	10	21.74
Glaucoma	3	17.65	3	25.00					6	13.04
Macular scar					2	25.00	1	11.11	3	6.52
Epiretinal membrane			1	8.33	1	12.50			2	4.35
Tractional retinal detachment					4	50.00			4	8.70
IOL membrane							1	11.11	1	2.17
Persistent vitreous membranes			1	8.33			2	22.22	3	6.52
Corneal opacity	1	5.88							1	2.17
Disc pallor			1	8.33					1	2.17
Foveal thinning					1	12.50			1	2.17

Table 3. Pediatric uveitis medical management.

Treatment	n
Corticosteroids	
Topical	57
Oral	54
Intravenous	1
Oral antibiotics	2
Oral antivirals	2
Oral antifungal	1
Antitoxoplasmosis therapy	5
Antihelminthic therapy	4
Anti-tuberculosis treatment	2
Immunomodulators	25
Biologics	5
Intravitreal	
Anti VEGF	1
Ozurdex	1
Others	
Laser photocoagulation	1
Antiglaucoma	16
AC tap	1
Intracameral injection	1

children. Triple therapy which includes 2 IMT drugs (MTX and MMF) along with 1 biologic was given to 2 children.

Further intravitreal bevacizumab injection along with intracameral for neovascularization of iris causing hyphema in chronic uveitis was given to 1 child, and Ozurdex implant for non-resolving CME post-cataract surgery for complicated cataract in 1 child.

Other treatments included antiglaucoma drugs used in 16 children, 12 received topical and 4 oral, and one child having persisting dense vitritis and vitreous membranous AC tap was done and sent for HPE and culture to rule out endophthalmitis.

Surgical management

Surgical procedures were performed on 16 children. Cataract surgery with IOL implantation was the most common procedure performed on 7 of them.

Infectious uveitis. Vitreoretinal procedures were done in 4 cases, which included 2 with healed toxoplasma retinochoroiditis with thickened posterior hyaloid and traction over macula and disc, one with toxocara granuloma causing traction on the disc, and one with intraocular cysticercosis with tractional retinal detachment.

Non-infectious uveitis. One child underwent vitrectomy along with silicon oil injection due to chronic vitreous membranes secondary to pars planitis. Other surgical interventions include trabeculectomy done bilaterally in one child for uveitis with intumescent cataract with secondary glaucoma, removal of posterior sub-Tenon's tricot in one child due to non-responding steroid-induced glaucoma, and EDTA chelation in one child due to dense BSK obstructing the visual axis. Details of surgical management are shown in Table 4.

Age and prognosis

Idiopathic anterior uveitis and panuveitis cases seen in 4 of 9 children in the age group of 0–5 years had a poor prognosis. JIA-associated uveitis requiring more than one IMT to control inflammation and late presentation with complications like cataract and BSK at baseline were associated with poor visual outcome in 11 of 31 children in the age group of 6–10 years. Posterior uveitis with

Table 4. Pediatric uveitis surgical management.

	N	%
Treatment	16	
Cataract surgery	7	43.75
Glaucoma surgery	1	6.25
Diagnostic vitrectomy	1	6.25
Vitreoretinal surgery	5	31.25
EDTA chelation	1	6.25
Tricot removal	1	6.25

the macular scar and idiopathic intermediate uveitis requiring triple-drug regime was associated with poor prognosis in 6 of 27 children in the age group of 11–18 years.

Discussion

In our study, we analyzed the pattern of pediatric uveitis at a tertiary eye care hospital. To summarize our results, we studied 65 children in our cohort. Males were common, accounting for 55.4% of the cohort, and 6–10 years was the most common age at presentation. Bilateral presentation was seen in 60% of cases, with anterior uveitis being a common location, accounting for 29.23% of cases. Non-infectious etiology was the most common and was seen in 73.84% of all cases, of which 43.75% were idiopathic. Toxoplasmosis accounted for the highest number (26.15%) of infectious etiology; 33.84% of children had low BCVA at presentation; 56.92% showed improvement in vision; and 15.38% had worsening of vision. Also, 78.46% of children required medical management and 24.61% of children required surgical intervention; 65.21% of children had complications at baseline.

The mean age was between 10.185 ± 4.36 years (range = 2–18 years) which was similar to previous reports.[2,4,7,8] There was a male preponderance in our study, 55.4% males and 44.6% females found same as in Indian studies[7,9] compared to developed countries where there were a greater number of females.[2,8,10]

Our study pattern shows 60% with a bilateral presentation due to a greater number of cases with idiopathic intermediate uveitis and panuveitis, and 40% of cases with the unilateral presentation which constituted mostly anterior and posterior uveitis. Ganesh and colleagues,[7] Rosenberg and colleagues,[11] and Kump and colleagues[10] reported bilateral cases more commonly than unilateral in their studies.

The most common location of uveitis was anterior and intermediate, with anterior having a slight predominance. BenEzra and colleagues[12] reported intermediate uveitis as the most common location.

JIA was the most common cause of anterior uveitis accounting for 31.57% of the cases as seen in other studies by Kump and colleagues[10] who reported it in 33%, Ganesh and colleagues[7] in 22.2%, Gautam and colleagues[9] in 37.34%.

Idiopathic cases were the most typical in the intermediate uveitis – up to 57.14% – which is similar to all previous studies,[4,7,9,11] and other causes like TB and sarcoid were seen less often in our study. Sarcoid accounted for 4.61% of all cases in our study similar to 4.2% reported by Ganesh and colleagues.[7]

Posterior parasitic uveitis accounted for the maximum number of 11 (64.7%) out of total of 17 cases of infectious uveitis in our study. Rathinam and Namperumalsamy[13] reported parasitic anterior chamber granuloma (49.3%) and traumatic uveitis (9.8%) predominant in the pediatric age group in their study. Toxoplasmosis was the most common infectious etiology (10.4%) in our study. Other studies outside India also reported toxoplasmosis as the most common infectious etiology. Dajee and colleagues (5%),[4] Souto and colleagues (7.7%),[8] and Kump and colleagues[10] reported no case of tuberculosis and Rosenberg and colleagues[11] reported only 1 case. In our study, tuberculous etiology was seen in only 2 children (3.07%): 1 child with intermediate uveitis and 1 panuveitis; this is different from other Indian studies by Ganesh and colleagues[7] who reported it in 7.4% and Gautam and colleagues[9] in 14.91% of their cases. This could be because our diagnosis of tuberculosis was based on TST and chest imaging and no ocular sampling was performed. The reason for low incidence in pediatric population in India could be because all are BCG vaccinated. We have done only TST in many of the children and an extensive evaluation like HRCT was not done, moreover, ocular sampling was not performed except for few cases. QFT testing was not done as many children were from low socioeconomic status.

Among the panuveitis, idiopathic panuveitis was the most common type, and was seen in 5 of 12 cases (41.6%) compared to 20% by Ganesh and colleagues[7] and 22% by Gautam and colleagues[9]. Next most common cause was VKH which was seen in 3 of 12 cases (25%), which was less than in the study by Ganesh and colleagues[7] who reported it to be 40%. Behcet's was low in our study (only 1.53%) compared to Gautam and colleagues[9] and BenEzra and colleagues[12] which was 4.6%. It was not reported in other studies from south India.[7,13]

In total, 33.84% of children had poor baseline visual acuity ranging from the perception of light to 6/60, 56.92% showed improvement on

initiating treatment, and 15.38% had worsening of visual acuity at the last follow-up. The causes responsible for low vision were 3 cases of tractional retinal detachment, and 3 cases due to maculopathy (scar/foveal atrophy).

Gautam Seth and colleagues[14] reported that maculopathy (35%) followed by glaucoma (20%) was the most common complication in their study. Rosenberg and colleagues[11] reported cataract (27.70%), vitreous opacification (18.92%), cystoid macular edema, and a macular choroidal neovascular membrane/scar (11.49% each) to be the most common causes of legal blindness. Posterior uveitis accounted for most cases of poor vision among all the subtypes. This was similar to studies by Rosenberg and colleagues[11] and Gautam and colleagues.[9]

A total number of children with complications was 46 (70.7%), in 30 of them (65.21%) complications were present at baseline and a maximum of up to 17 (36.96%) were in the anterior uveitis group. Lack of early referrals and improper follow-up in our region could reflect these values. The most common complication was cataract (21.74%), followed by cystoid macular edema (15.22%) and glaucoma in (13.04%); these findings are in line with previous studies.[4,8,10,11]

A study by Ganesh and colleagues,[7] Rosenberg and colleagues,[11] and Souto and colleagues[8] had a smaller number of cases with cystoid macular edema compared to our study which was 7 of 46 cases (14.58%). The CME was high in our study probably because of routine optical coherence tomography screening for all pediatric uveitis.

In this cohort, 83.07% of children received topical and oral steroids. Treatment of non-infectious uveitis cases included the following: IMT was used in 38.46% and biologics was used in 7.69% of total cases. Cann and colleagues[15] reported using IMT in 72.9% and biologics in 34.9% of their cases. The most common IMT used in our study was methotrexate, including use in JIA-associated uveitis. Methotrexate monotherapy sufficed in 71.42% of JIA uveitis patients, similar to report by Simonini and colleagues[16] who found almost 73% control of inflammation with methotrexate, whereas Souto and colleagues[8] reported control of inflammation in 52% of cases and Cann and colleagues[15] reported MTX resistant cases 47.9% of whom required third-line therapy. In our study, only 28.57% of children with JIA required additional use of biologics. Biologics were used in 14.28% of idiopathic cases, which is an almost similar figure to their study.

Control of inflammation was achieved in 26.15% with a single drug – either methotrexate or mycophenolate mofetil or azathioprine – and in 8.95% with 2 drugs and in 2.98% with 3 drugs. This discrepancy in our study compared to Cann and colleagues[15] can be attributed to a fewer number of children and a smaller JIA cohort. A shorter follow-up of 3 years compared to a longer follow-up of 10 years suggests that multiple drugs may be required to achieve long-term control of inflammation. A financial constraint in our scenario also resulted in lesser use of biologics in our study.

Overall, 24.61% of children underwent surgical procedures similar to those reported by Ganesh and colleagues[7] (28.9%) and Dajee and colleagues[4] (30%). Gautam Seth and colleagues[15] and Rosenberg and colleagues[11] reported a higher number of their cases that underwent surgical treatment.

Cataract surgery was the most common procedure, done in 7 of 16 (43.7%) cases which accounted for 10.4% of total children in our cohort. Gautam Seth and colleagues[7] and Ganesh and colleagues[9] and also reported cataract surgery to be the most common surgical procedure performed. Five children underwent pars plana vitrectomy for complications of posterior uveitis like tractional retinal detachment.

Anterior uveitis (n = 7) followed by posterior uveitis (n = 4), panuveitis (n = 3), and intermediate uveitis (n = 2) required the highest number of surgical interventions. Yanges and colleagues[17] reported anterior uveitis (n = 57 eyes) followed by the panuveitis group (n = 22 eyes) required the highest number of surgical intervention/secondary procedures. These results reflect the greater number of JIA cases in their study.

The small cohort size, retrospective nature of the study, and short duration of follow-up of only 3 years were the main limitations of this study. We found that many children had complications at presentation and hence early referral and adequate management would be needed for a good visual outcome. Similar to other studies late presentation, young age was associated with poor prognosis.

Conclusion

Idiopathic cases were a common cause of non-infectious uveitis, and parasitic posterior uveitis was common among the cases with infectious etiology. Cataract was the most common complication. Children who presented with JIA at a younger age, idiopathic anterior uveitis, and panuveitis with complications at baseline and posterior uveitis associated with macular pathology had a poor prognosis. Pediatric uveitis is a chronic visually impairing condition; hence, early detection and treatment along with a long-term follow-up is required for preserving the quality of vision and life in these children.

Conflict of interest statement

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