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The clinical profile and aetiological pattern of anterior uveitis- A hospital based study

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Abstract:
Introduction: *Uveitis is a group of complex inflammatory disorder of the uveal tract with diverse aetiology. The most common form is anterior uveitis affecting the iris and pars plicata of the ciliary body which can lead to severe vision threatening complications if not treated appropriately.*
Objectives: *1.To study the incidence, modes of presentation and etiological patternof anterior uveitis. 2. To evaluate the treatment, its outcome and the complications that could occur over the study period.*
Materials and Methods: *A prospective, cross sectional and clinical study was done in the Department of Ophthalmology, Maha Rani Laxmi Bai Medical College during December 2018 to Feburuary 2020. All patients between 20 and 80 years of age clinically presenting with anterior uveitis were studied. A thorough clinical evaluation followed by investigations was done to determined aetiology. Patients were put on specific and nonspecific treatment and were followed up for a period of 6 months. Complications were noted.*
Results: *Anterior uveitis occurred most commonly in the 21 to 40 years age group. Majority of the cases had nongranulomatous inflammation (88%) in comparision of granulomatous inflammation(12%). The aetiology of uveitis remained unknown in most cases (42%). Most common cause was observed to be blunt trauma (16%) followed by phacolytic (13%). Most cases responded well to treatment. Commonest complication was posterior persistent synechiae (25%), and cataract was the second common (15%).*
Conclusion*: A balanced view of the disease needs to be taken while investigating and treating anterior uveitis. A thorough history and physical examination is required in each case to facilitate a final diagnosis.A timely diagnosis and appropriate treatment however can improve visual outcome.*
Keywords: *Anterior uveitis, Behcets disease, Granulomatous, Tuberculosis*

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I. Introduction

Uveitis, or inflammation of the uvea (which consists of the iris, ciliary body, and choroid), may be caused by a number of different etiologies.[1,2]Anterior uveitis is defined by the presence of cells or cellular aggregates that are visible in the anterior chamber during examination.[3] Anterior uveitis is one of the most common types of ocular inflammation that eye care practitioners will encounter.[1–4] It may present as acute, subacute, or chronic.[4]An estimated 14–17 cases per 100,000 and 38,000 new cases are confirmed each year in the USA.[5]Uveitis accounts for ~10% (30,000 new cases annually) of legal blindness in the USA, and it may affect all ages, although it is most common in individuals in the third and fourth decades.[3,5–8] The total population prevalence of uveitis varies globally with an estimated prevalence of 730 cases/1,00,000 in India.[7] Anterior uveitis may be caused by infectious, noninfectious, and masquerade diseases. Anterior uveitis is the most common form of uveitis (57.4%). If untreated or not appropriately treated, acute inflammation can develop into chronic, sight-threatening inflammation,[9] emphasizing the role of the primary eye care practitioner in appropriately and effectively managing these patients. The primary eye care practitioner is often the first health care provider to see and treat cases of anterior uveitis.[4] Anterior uveitis is an umbrella term encompassing inflammation of the iris (iritis), anterior ciliary body (cyclitis), or both (iridocyclitis).[12] Another important distinction in anterior uveitis is to understand the acute course versus the chronic course of the disease. According to the Standardization of Uveitis Nomenclature criteria, acute or limited cases refer to an episode of <3 months duration, while chronic or persistent cases extend beyond that time frame.[12] This division is important clinically, as the etiology and management strategy differ between the two.[11] The symptoms of chronic anterior uveitis are generally less severe, more commonly granulomatous in nature, and more likely to be accompanied by signs of chronicity, including band keratopathy and iris changes such as atrophy and lenticular changes.[11] Recurrent anterior uveitis refers to relapsing inflammation separated by >3 months without treatment.[12] The pathology of an anterior uveitis can be either granulomatous or nongranulomatous.

Granulomatous inflammation is associated with large, mutton-fat keratic precipitates (KPs) composed mainly of epitheloid cells on the corneal endothelium. Granulomatous uveitis tends to be chronic and is often associated with systemic conditions and autoimmune reactions.[9] It may also be associated with infectious etiologies such as syphilis, Lyme disease, tuberculosis (TB), and herpetic viral infections. Nongranulomatous inflammation, by contrast, tends to be associated with smaller lymphocytic cells in the anterior chamber.[9] Laterality is another element that should be considered when diagnosing and – ultimately – when considering a systemic workup for anterior uveitis patients. Following a similar pattern to granulomatous versus nongranulomatous inflammation, bilateral presentations tend to be associated with chronic, systemic conditions, whereas unilateral conditions tend to be acute and idiopathic or infectious.[9] The final diagnostic element involves the clinical features of the inflammation. By characterizing uveitis as anterior or posterior, acute or chronic, granulomatous or nongranulomatous, unilateral or bilateral, and by noting important clinical signs and symptoms, the primary care practitioner is able to formulate an appropriate diagnosis that is suggestive of an infectious or noninfectious underlying etiology, which will help the clinician devise a targeted work up. Furthermore, they can devise a targeted systemic workup to minimize cost and inconvenience to the patient. Finally, it allows them to initiate a thoughtful treatment tailored to specific aspects of the patient's clinical presentation. Accurate – and complete – diagnosis is a critical first step in the management of the patient with anterior uveitis.

II. Materials and Methods

This is a prospective, cross sectional and hospital based clinical study which included 100 patients aged between 20 and 80 years, attending Outpatient Department of Maha Rani Laxmi Bai Medical College, Jhansi ,Uttar Pradesh, with signs and symptoms of anterior uveitis during December 2018 to Feburuary 2020 for period of 15month. Necessary clearance from the Institutional Ethical Committee was taken, and informed consent was taken from all the study participants .

Inclusion Criteria:

1. The patients, who were clinically diagnosed with anterior uveitis over a period of 15 month.

Exclusion Criteria:

1. Anterior uveitis following ocular injuries (open or closed globe), infective corneal ulcers, recent intraocular surgeries and those associated with other uveitis entities like intermediate, posterior or panuveitis were not included in the study**.**

2. Masquerade syndromes presenting as anterior uveitis has also been excluded.

A standard clinical proforma was filled in all cases, which included salient feature in the history, visual acuity using snellen's visual acuity chart, clinical findings, laboratory investigations, and the final aetiology. All patients were examined under slit lamp. Details on disease severity, laterality, chronicity, ocular signs and associated systemic conditions were noted. Presentation was considered as unilateral if active inflammation was present in only one eye and bilateral if both eyes presented with active inflammation. Intraocular inflammation was assigned anterior uveitis based on International Uveitis Study Group Criteria. The inflammation was defined as acute if symptoms were present for <3 months, chronic if symptoms were present for 3 months or more and recurrent if two or more episodes of inflammation separated by a disease-free period. Anterior uveitis was defined granulomatous if large keratic precipitates, nodules at pupillary margin (Koeppe nodules) or nodules on or within the anterior iris stroma (Busacca nodules) were present. A short differential diagnosis was made in each case. Subsequently, a tailored laboratory investigation was carried out. Investigations included total and differential counts, erythrocyte sedimentation rate, urine and stool examination, mantoux test. Serological tests for, syphilis, HIV, rheumatoid factor was done in all cases. Radiological investigations included X-ray of chest, lumbosacral and knee joints. Other special investigations were considered whenever necessary like quantiferon gold test, HLA-B27, ANA, ANCA and ACE levels were done whenever necessary. Final aetiological diagnosis was made based on history, clinical features, laboratory investigations and systemic evaluation by other medical specialities The anterior uveitis was considered to have idiopathic aetiology when it was not associated with human leukocyte antigen-B27 haplotype and neither with defined clinical syndromes nor with definitive aetiology.[10] All patients were treated medically with topical steroids (prednisolone acetate 1%) and topical cycloplegic mydriatics (atropine or homatropine). Steroids frequency was titrated according to the severity of uveitis. Appropriate treatment was given whenever etiology was known. Systemic antimicrobials were administered when infectious agent was found to be the cause. Systemic steroids were used when inflammation was severe, not responding to treatment and patients with macular oedema. Patients with lens-induced inflammation were treated surgically. In patients with uveitis associated with visually significant cataract, cataract surgery was done 3 months after active inflammation had subsided.These patients were given with high doses of topical and systemic steroids 1 week prior to surgery and then gradually tapered. Cases of

anterior uveitis with secondary glaucoma were treated with T. acetazolamide 250 mg BD/TID and/or timolol 0.5% eye/drops BD along with topical steroids. Each patient was followed up for 6 months. The complications were noted, and the response to treatment was recorded and evaluated in each patient.

III. Results

A prospective observational study conducted at a tertiary care hospital for 15 months period. Table 1 summarizes the sociodemographic and clinical characteristics of the study participants. Male patients dominated the study accounting for 56% and the participants age varied from 20 to 80 years, but 61% of patients were young patients, aged between 20 and 40 years. In our study majority of patients (88%) presented with uniocular involvement. Majority of the cases had nongranulomatous inflammation (88%) and rest of 12 % had granulomatous infiammation [Graph 1]. About 70% of the patients presented with acute and 21% presented with chronic disease, 9% had recurrent uveitis [Graph 2]. Table 2 shows the occupation of the study participants. Most of the patients were manual laborers, officials and housewives accounted for almost equal proportions. Graph 3 shows the complications observed in the present study. Nearly 40% of the patients had no complications. Persistent posterior synecheae (25%) was the most commonly observed complication followed by cataract(15%). Secondary glaucoma was seen in 13%. Graph 4 shows the distribution of etiological factors in our study. It was noted that cause was not recognized (Idiopathic) in significant (42%) number of patients. Among the identifiable diseases accounted for blunt trauma (16%), followed by phacolytic uveitis (13%) which was the second most common identifiable cause. Herpes zoster was responsible for 12% of the disease. Table 3 summarizes the visual outcome in our study participants. It is observed that nearly 35% of the patients had visual acuity of ≤6/60 at the time of presentation and the numbers improved to just over 2% after treatment. It is noted that vision of 82% of the patients improved to 6/12 or better comparatively to 31%of the patients before therapy.

Table 1: Summarizes the sociodemographic data of the study participants

Age (in years)	**No. of patients**	**Percentage**
21-40	61	61
41-60	29	29
61-80	10	10
Sex distribution		
Male	56	56
Female	44	44
Laterality		
Unilateral	88	88
Bilateral	12	12

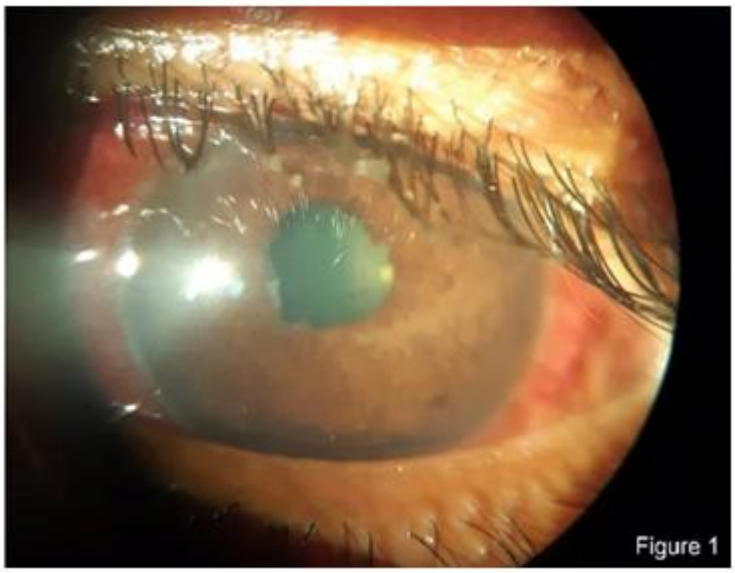
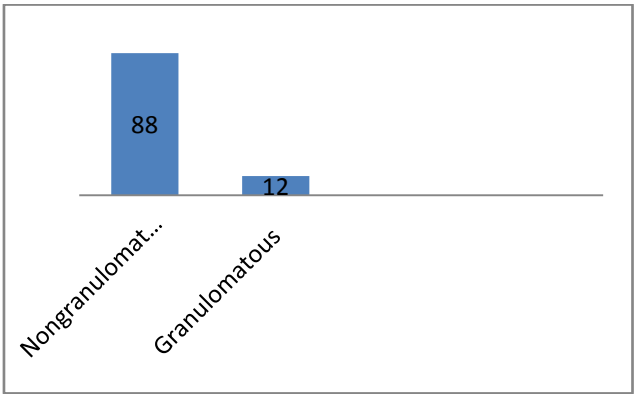


Fig. 1: Granulomatous inflammation showing koeppe nodules in the pupillary margin and busacca nodules on the surface of iris with mutton fat keratic precipitates

Graph 1: Type of inflammation



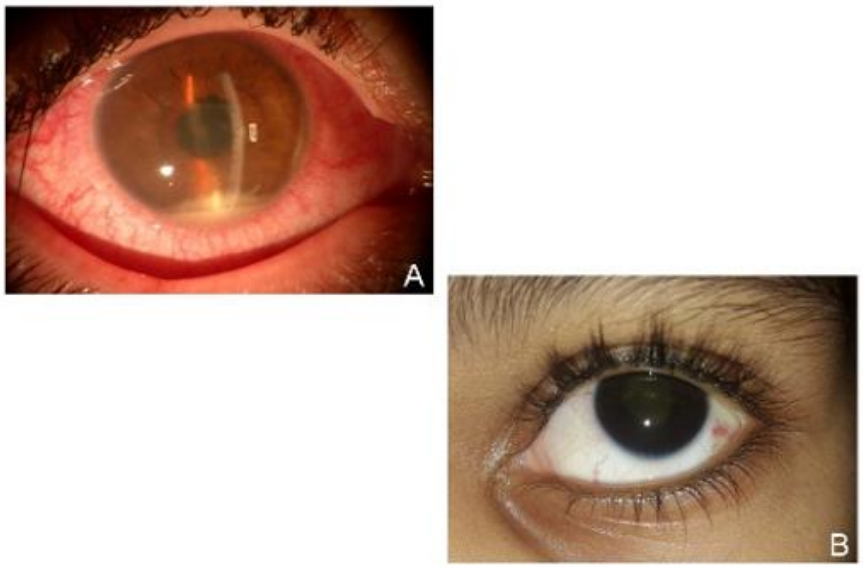
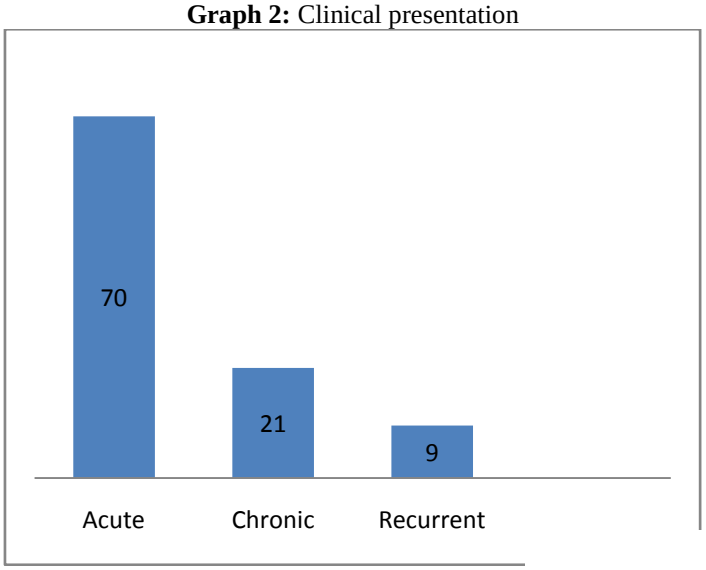
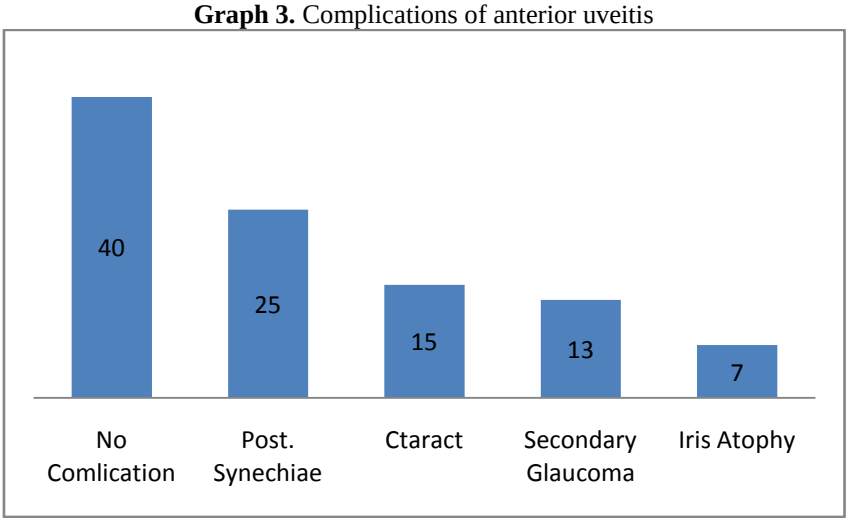


Fig. 2: Behcets disease- A: Before the treatment showing circumciliary congestion and frank hypopyon. B: After the treatment showing a quiet eye with resolved hypopyon

Graph 2: Clinical presentation



Graph 3. Complications of anterior uveitis



Graph 4: Etiological factors for anterior uveitis in our study

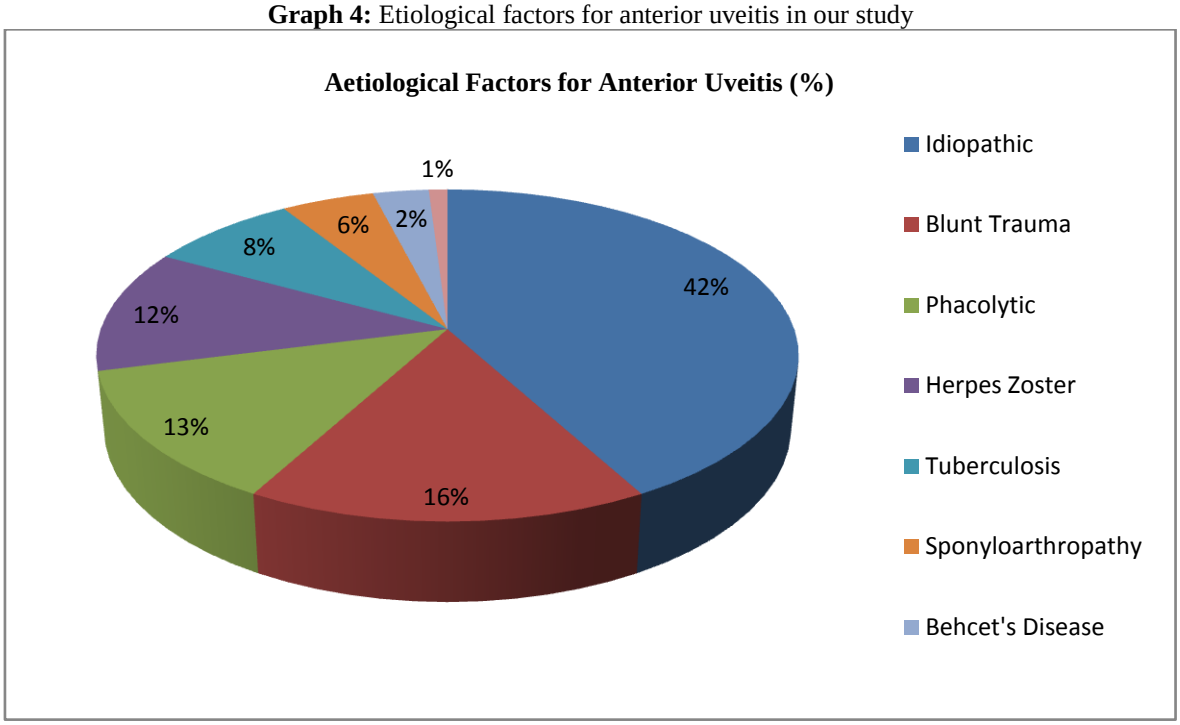


Fig. 3: Posterior synechiae

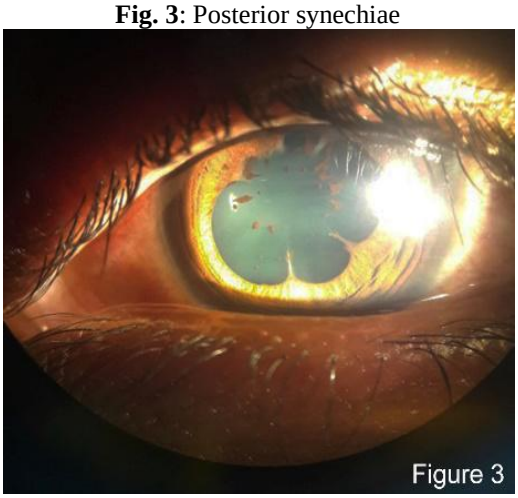


Table 2: Occupation of patients

Occupation	**No. of patients (%)**
Labourer	48 (48%)
Officials	22(22%)
Housewives	20(20%)
Business	06(6%)
Student	04(4%)

Table:2 visual acuity before and after treatment

Visual acuity	**Numbers of patients (N=100)%**	
	Before treatment	**After treatment**
PL+PR+	7	-
<6/60	11	-
6/60	17	2
6/36	9	5
6/24	11	4
6/18	12	7
6/12	20	11
6/9	11	26
6/6	2	45

IV. Discussion

In our study, 60% of patients were between 20 and 40 years of age and only 10% of the patients were aged over 60 years. This age predilection is similar many reported studies.[13,14] Idiopathic anterior uveitis was the commonest cause and which is similar previous reports.[13-15] This can be explained by high antigenicity found in this age group. In older age group, anterior uveitis was usually of phacolytic origin. It was observed that males were more (56%) affected compared to females (44%), which is similar to observations made by Rathinam *et al*.,[13,15] but in contrary Alezandro Rodriguez *et al* .[16] reported female preponderance of the disease. This may be because men tend to seek medical attention more often than women, and socioeconomic habits may put male patients at a greater risk for development of anterior uveitis. Majority of patients in our study were laborers by occupation (48%). Most common cause of anterior uveitis in them was blunt trauma. This may be due to their occupational risk. Majority of patients came with unilateral presentation (88%). This finding was comparable with that of Rathinam *et al*. [13,15] study (85.3%). However, there was no significant predilection for either the right or left eye. The most common presentation was acute iridocyclitis (70%) than chronic (21%) and the recurrent iridocyclitis (9%). Rathinam *et al*. reported 71.9% acute, 24.3% chronic and 3.8% recurrent. Nongranulomatous inflammation was seen in majority of the cases and this is comparable with the previous studies.[13,16]In this study, 88 patients (88%) had nongranulomatous inflammation and in 12 patients (12%) it was granulomatous. Findings are comparable with previous studies; the findings were consistent with previous studies of ozdal MP et al.[15] This was comparable to Sudha Madhavi et al. from Karnataka reported about 75.6% acute uveitis and 17.8% of chronic uveitis.[17] Out of 12 granulomatous inflammation 10 were chronic, and two patient had recurrent presentation. Granulomatous type of inflammation was observed in six patients of tuberculosis, three patient of herpes. In the present study, of the identifiable causes, blunt trauma (16%) was the most common cause of anterior uveitis followed by phacolytic (13%) etiology. Although herpes zoster accounted for 12% of the cases, which is comparable with other two studies where it stood first, 6 patients had spondyloarthropathy and 2 patients who presented with hypopyon and aphthous ulcer were diagnosed to have behcets disease (Graph 4). All the patients responded favorably to medical treatment. Herpes is not the most common in the present study. However, it was the most common infectious cause in our study. 9% of the patients had tubercular anterior uveitis which is comparable with Rathinam *et al*.[13] and Singh *et al*. study, [14] whereas there are no data in Henderly *et al*. study.[18] This difference may be because all other studies were

conducted at referral centers, where cases usually chronic and recurrent ones, are referred from primary and secondary centers. Whereas present study was done in a general ophthalmic clinic and most people were from villages. Complications were commonly noted in chronic and recurrent cases. Most common complication observed was persistent posterior synechiae in 25 eyes (25%), cataract in 15 eyes (15%). Secondary glaucoma was seen in 13 eyes; Iris atrophy was seen in 7 eyes (7%). Rothova et al. reported cataract in 19% of cases and glaucoma in 11%.[19] In present study, uveitis was found to be associated with diabetes mellitus in 11 patients (11%) and hypertension in 4 (4%) patients. All those who had diabetes mellitus were above 50 years of age. 8 out of 11 diabetes mellitus patients had chronic uveitis. In a study of uveitis presenting in elderly, it was noted that diabetes should probably be considered a risk factor for uveitis development.[20] Visual acuity was 6/12 or worse in the majority (87%) of eyes at presentation. Following treatment most eyes regained visual acuity of 6/9 or better (701%). In few eyes with complicated cataract or macular edema, visual acuity improved only marginally. No complications were seen in 40eyes (40%).

V. Conclusion

Despite exhaustive efforts to identify the cause, majority of the cases remained idiopathic. Anterior uveitis is a vision threatening disease with varied causes but mostly the aetiology remains unknown. In some cases, the systemic diseases manifesting as uveitis could be recognized only during the detailed work up for uveitis. Investigations should be ordered keeping in mind the availability and cost factor and a tailored work up depending on age, history, clinical examination would be appropriate. Hence, a prompt diagnosis and early initiation of treatment can save the vision without significant sequelae.

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