“ETIOLOGICAL PROFILE AND CLINICAL PATTERNS OF UVEITIS”

DISSERTATION SUBMITTED TO

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M.S (OPHTHALMOLOGY)

Registration No.: 221713252

(BRANCH-III)

TIRUNELVELI MEDICAL COLLEGE

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This is to certify that this dissertation titled **"ETIOLOGICAL PROFILE AND CLINICAL PATTERNS OF UVEITIS"** submitted by **DR.V.C.GITANJALI** to the Tamilnadu Dr.M.G.R Medical university, Chennai, in partial fulfilment of the requirement for the award of the MS degree (Branch III) in ophthalmology during the academic period of 2017-2020 is an original bonafide research work carried out by her under my direct supervision and guidance. I forward this to the Tamil Nadu Dr.M.G.R. Medical University, Chennai, Tamil Nadu, India

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PROTOCOL TITLE: ETIOLOGICAL PROFILE AND CLINICAL PATTERNS OF UVEITIS
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Dear Dr.V.C.GITANJALI, MBBS., The Tirunelveli Medical College Institutional Ethics Committee (TIREC) reviewed and discussed your application during The IEC meeting held on 01.09.2017.

THE FOLLOWING DOCUMENTS WERE REVIEWED AND APPROVED

1.	TIREC Application Form	☐
2.	Study Protocol	☐
3.	Department Research Committee Approval	☐
4.	Patient Information Document and Consent Form in English and Vernacular Language	☐
5.	Investigator's Brochure	☐
6.	Proposed Methods for Patient Accrual Proposed	☐
7.	Curriculum Vitae of The Principal Investigator	☐
8.	Insurance /Compensation Policy	☐
9.	Investigator's Agreement with Sponsor	☐
10.	Investigator's Undertaking	☐
11.	DCGI/DGFT approval	☐
12.	Clinical Trial Agreement (CTA)	☐
13.	Memorandum of Understanding (MOU)/Material Transfer Agreement (MTA)	☐
14.	Clinical Trials Registry-India (CTRI) Registration	☐

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1. The approval is valid for a period of 2 year/s or duration of project whichever is later
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CONTENTS

ABBREVIATIONS

1.SUN -Standardization of Uveitis Nomenclature

2.FFA -Fundus Fluorescin Angiography

3.OCT -Optical Coherence Tomography

4.CNVM -Choroidal NeoVascularization Membrane

5.RPR -Rapid Plasma Reagin

6.VDRL -Veneral Disease Research Laboratory

7.FTA-ABS -Fluorescin Treponemal Antibody Absoption test

8.THA -Treponemal HemAgglutination test

9.CSF -Cerebrospinal Fluid

10.VZV -Varicella Zoster Virus

11.CMV -Cytomegalovirus

12.HIV -Human Immunodeficiency Virus

13.HLA -Human Leucocyte Antigen

14.RF -Rheumatoid Factor

15.ESR -Erythrocyte Sedimentation Rate

16.JCA -Juvenile Chronic Arthritis

17.ACE -Angiotensin Converting Enzyme

18.ELISA -Enzyme Linked Immunosorbent Assay

19. RVD - RetroViral Disease

1] **INTRODUCTION**

The uvea is the middle, pigmented, highly vascular layer of the eye . It includes iris, ciliary body, and choroid .The ciliary body secretes aqueous which provides nourishment to the avascular structures (cornea,lens,anterior hyaloid) .The choroid provides nutrition to the outer retina. Due to its high vascularity, the uveal tract is frequently involved in systemic vascular ,immune and infectious diseases.

Uveitis is defined as inflammation of the uvea . The inflammatory process primarily affects the uvea with subsequent damage to the retina, optic nerve,sclera and vitreous. Uveitis can be classified based on the anatomical site involved [***Standardization of Uveitis Nomenclature (SUN)***], or clinical course (acute, chronic, or recurrent), or etiology (infectious or noninfectious), or pathology (granulomatous or nongranulomatous) .

2]CLASSIFICATION OF UVEITIS[5]

a]Based on Predominant Anatomical Site Affected

Anterior Uveitis	Intermediate Uveitis	Posterior Uveitis	Panuveitis
Iritis	Posterior Cyclitis	Choroiditis (focal/ multifocal/ diffuse)	
Anterior cyclitis	Pars planitis	Chorioretinitis	
Iridocyclitis	Hyalitis	Retinochoroiditis	
	Basal retinochoroiditis	Neuro-uveitis	

b] Based on etiology

- infective (exogeneous or endogeneous),

-idiopathic

-Inflammatory

-neoplastic

-traumatic.

c]**Based on pathology**:

	NONGRANULOMATOUS	GRANULOMATOUS
ONSET	acute	insidious
EVOLUTION	Spontaneous regression (mostly)	chronic
KERATIC PRECIPITATES	Confluent ,fine (lymphocytes,plasma cells)	Non confluent,large mutton fat (epitheloid cells ,histiocytes)
IRIS	Occasional	Koeppe and busacca nodules
FLARE	Intense	Mild
SYNECHIAE	Easy to break with mydriatics in early stage	Dense broad based ,difficult to break
VITREOUS EXUDATES	Fine punctate opacities in vitreous	Heavy vitreous exudates

d]Based on clinical course

-acute

-recurrent

-chronic

3] CLINICAL FEATURES

a)Anterior Uveitis

SYMPTOMS:This is characterized by photophobia, blurred vision, severe pain(iris richly supplied by ophthalmic division of trigeminal nerve), redness.

SIGNS: circumciliary congestion, keratic precipitates, aqueous flare and cells.The presence of cells is pathgnomonic of active inflammation.

Depending on the clinical presentation, it can be categorized as iritis, cyclitis or iridocyclitis.

a)Iritis

It is characterized by circumcorneal ciliary congestion. When the nutrition of the corneal endothelium becomes affected change, the exudates tend to stick there, forming ***keratic precipitates***. The keratic precipitates are scattered over a triangular area in the lower part of the cornea known as Arlt triangle.

Due to inflammation, there is a breakdown in blood aqueous barrier which causes exudation of a protein-rich fluid into the tissue spaces with leucocytic or lymphocytic infiltration. Large amount of exudation and swelling causes the iris to virtually become a water logged and the normal pupillary reactions become sluggish or abolished. In very intense iritis, polymorphonuclear leucocytes are poured out and sink to the bottom of the anterior chamber to form a hypopyon[4].

***Sun Working Group grading for anterior chamber cells*[5]**

GRADE	CELLS IN FIELD(high intensity 1 by 1 mm slit beam)
0	<1
0.5+	1-5
1+	6-15
2+	16-25
3+	26-50
4+	>50

***Sun Working Group grading for anterior chamber flare*[5]**

GRADE	DESCRIPTION
0	None
1+	Faint
2+	Moderate(iris and lens details clear)
3+	Marked(iris and lens details hazy)
4+	Intense(fibrin or plasmoid aqueous)

When the exudates cover the surface of the iris or the pupil as a thin film ,the iritis is termed ***plastic.*** The iris sticks to the lens capsule because of the exudates and becomes fixed. If atropine is instilled at an early stage the iris may be freed and the pupil once again becomes dilated and circular .Once the adhesions are organised into fibrous bands which the atropine is unable to rupture, they are called ***posterior synechiae.*** When they are localized an application of mydriatic causes the intervening portions of the circle of the pupil to dilate. Such an irregular pupil is called festooned pupil. In course of time, contraction of organizing exudates upon the iris causes the pigment epithelium on its posterior surface to be pulled around the pupillary margin which is called ***ectropion of the uveal pigment***[4].

When the pupillary margin is attached to the posterior surface of the lens,it is called ***seclusio pupillae or annular synechiae or ring synechiae***.The aqueous starts to collect behind the iris .This results in iris bombe.Here, anterior chamber is deep at the centre and shallow at the periphery4.

When the exudate has been more extensive, it may organize across the entire pupillary area ,this condition is called a blocked pupil, or ***occlusio pupillae***[4]***.***

When the posterior surface of entire iris is attached to the lens it is called ***total posterior synechiae***.

In the later stages, the degenerative changes in the ciliary body impairs aqueous production eventually leading to hypotony. Rise in intraocular

pressure is due to sticky albuminous fluid or due to the blocking of trabecular meshwork pores by pigments or due to trabeculitis**.**

ii)Cyclitis

The key features of cyclitis are keratic precipitates and cells in anterior vitreous. When the exudates organise, they form a transverse ***cyclitic membrane*** behind the lens**.** Strands of fibrous tissue are formed in the vitreous, which become anchored to the retina in various places. Their subsequent contraction may lead to tractional retinal detachment. The exudates that organize upon the surface of the ciliary body cause destruction of the ciliary processes, diminishing or abolishing the secretion of aqueous. Hence the intraocular pressure falls (***hypotony***) and the eye may become shrunken(***phthisis bulbi)***[2,4]**.**

iii)Iridocyclitis :

Features of both iritis and cyclitis are seen.

b) Intermediate Uveitis

Intermediate uveitis affects the pars plana of the ciliary body and the periphery of the choroid[2].

Clinical features [2,4]***:***

- Age: Children and adults
- Sex: Females are more commonly affected than males
- Laterality: Both eyes are affected in 80% of cases
- Onset: Insidious.

SYMPTOMS:The patient usually presents with complaints of floaters and a diminution of vision, due to opacities in the anterior vitreous.

SIGNS : Include a minimal aqueous flare with occasional keratic precipitates ('spill-over' anterior uveitis), anterior vitritis, white snowball-like exudates near the ora serrata, coalescent exudates giving the appearance of a 'snowbank' and mild peripheral periphlebitis. Other features include macular oedema, papillitis or disc oedema, retrolenticular cyclitic membranes, vitreous haemorrhage and rarely, tractional retinal detachment [2,4].

VITREOUS HAZE GRADING[5]

GRADING	HAZE SEVERITY
0	Good view of nerve fibre layer
1+	Clear disc and vessels but hazy NFL
2+	Disc and vessels hazy
3+	Only disc visible
4+	Disc not visible

GRADING OF VITREOUS HAZE(Nussenblatt 1985/National Eye Institute)[5]

Score	Description	Clinical findings
0	Nil	None
0.5+	Trace	Trace
1+	Minimal	Posterior pole clearly visible
2+	Mild	Posterior pole details slightly hazy
3+	Moderate	Posterior pole details very hazy
4+	Marked	Posterior pole details barely visible
5+	Severe	Fundus details not visible

The causes of intermediate uveitis includes

- idiopathic
- toxoplasmosis
- tuberculosis
- peripheral toxocariasis
- syphilis
- multiple sclerosis
- sarcoidosis.

The most common cause of intermediate uveitis is idiopathic. It is also known as pars planitis. The disease could either resolve spontaneously or have a prolonged course. However, most cases (80%) do not need any treatment. In chronic cases systemic steroids is beneficial.Immunosuppressants should only be used in severe cases where steroids have previously failed [2].

c)Posterior Uveitis

They may either focal or diffuse. The outer layers of the retina depend upon the choroid for nutrition so that an inflammation of the choroid always involves the former secondarily.

Symptoms: The typical symptoms of posterior uveitis include the presence of 'floaters' and diminution of vision, photophobia and redness if there is associated involvement of the anterior segment.

Signs: Signs include vitritis, exudates in the retina or choroid, oedema of the retina and choroid and sheathing of vessels. Other less frequent features include disc oedema, retinal haemorrhages, associated signs of anterior segment inflammation in case of spill over uveitis such as posterior synechiae, anterior aqueous flare and cells. Late changes such as a complicated cataract, glaucoma, retinal detachment or choroidal neovascularization may occur[2].

i***)Choroiditis***

Choroiditis can be focal, multifocal or diffuse in location. The two forms of choroiditis include a ***granulomatous*** form and a non granulomatous form.

Granulomatous form is associated with direct infection of organism.This form is characterised by the occurrence of localized accumulations of chronic inflammatory cells (lymphocytes, plasma cells, etc.) . ***Nongranulomatous*** or exudative choroiditis is a non-specific inflammatory response characterized initially by more acute cellular infiltration (predominantly leucocytes) and much exudation. The aetiology of which is exactly comparable with the similar type of non-granulomatous iridocyclitis. A acute choroiditis is seen ophthalmoscopically as a yellowish area. This is due to infiltration of the choroid, and the presence of exudates hiding the choroidal vessels. In the early stages, the membrane of Bruch is intact, and only fluid can pass through it, makes the overlying retina cloudy and grey so that the edges are hazy and ill defined.In the later stages the membrane of Bruch may be destroyed, allowing leucocytes to pass through it into the retina and vitreous. A marked vitreous haze usually indicates ciliary body involvement. The presence of keratic precipitates on the back of the cornea and posterior synechiae proves that in many cases of apparently localized choroiditis the whole uveal tract is implicated (panuveitis) [4].

The pigment of the retinal pigmentary epithelium is extremely resistant, even though the cells which contain it are destroyed. It tends to heap up into masses, both intra and extracellular, while the neighbouring pigment cells are stimulated to proliferate. Isolated masses of black pigment are thus formed in the white areas, especially at the edges, so that in the atrophic stage the white

areas are surrounded by a black zone of pigment. The process has then reached its natural termination, and these sharply defined areas remain permanently unaltered [2,4].

Symptoms in the early stages are mainly defects of vision due to lesions of the retina and clouding of the vitreous. The inflamed area is slightly raised, so that the contour of the retina is altered, causing distortion of images and giving rise to an apparent change in the size of the objects seen ***metamorphopsia.*** Thus, straight lines appear to be wavy, objects appear smaller than they are ***micropsia;*** sometimes larger ***macropsia,*** due to separation or crowding together, respectively, of the rods and cones. Subjective flashes of light due to retinal irritability (***photopsia***) are also seen. These subjective symptoms are often accompanied by the perception of a 'black spot' in front of the eye, corresponding to the lesion that is ***positive scotoma***.

In the later stages, the affected areas are incapable of giving rise to visual impulses so that ***negative scotomata*** are present in the field of vision. The importance of negative scotomata depends upon their location. Peripheral scotomata may pass unnoticed, but a central scotoma destroys vision; though peripheral vision still permits the patient to get about, all fine work is impossible.

The disease is chronic and organization of the exudates takes several weeks. The occurrence of fresh spots may extend the acute stage over a period of months, and the ultimate defects are permanent. The condition is often

bilateral. Choroiditis is usually classified according to the number and location of the areas involved.

ii)Disseminated or diffuse choroiditis:

Here small areas of inflammation are scattered over the fundus behind the equator. In milder cases, only a few spots are formed . In severe cases, the spots are numerous, passes through the stages described above and finally become atrophic areas..The acute stage is usually transient therefore the atrophic stage is seen more frequently.

iii)Multifocal choroiditis:

It has fewer and more discrete foci. Atrophic changes should be distinguished from those found in high myopes and senile degeneration.

iv)Central choroiditis:

This affects the posterior pole or macular region. It may occur as part of disseminated choroiditis, or can occur alone.

e)Juxtapapillary choroiditis of Jensen:

It is usually oval in shape. This type occurs in young persons as an exudation close to and about the same size as the disc. The exudates usually cover the retinal vessels. The inflammation slowly subsides, leaving atrophic patches [4].

4]EVALUATION OF UVEITIS [2,3,4,8]

a) DETAILED HISTORY

Uveitis is frequently associated with systemic disease. Elaborate history taking and review of systems is an essential first step in elucidating a cause. Demographic history(details on age,gender,race,residence or location,occupation,socioeconomic status) gives clue about the endemic disease.Family history is important in case of infectious diseases and congenital disorders.Social history is important to rule out veneral diseases like syphilis, AIDS. Provisional diagnosis can be arrived in most of the cases with history and clinical work .

b) INVESTIGATIONS

Laboratory studies are usually meant for the confirmation of diagnosis yet there are set of investigations for assessing the fitness for the treatment like liver function tests before starting methotrexate, FFAand OCT for CNVM ,cystoid macular edema,iatrogenic complication like blood sugar levels in case of chronic oral steroids. Laboratory studies are never a substitute for a thorough history and clinical work up.

Simple anterior uveitis need not be investigated mainly because it may be a very early stage of uveitis .

Investigation is needed in all cases of

- Intermediate uveitis
- Posterior uveitis
- diffuse uveitis
- bilateral uveitis
- inflammatory uveitis
- uveitis is granulomatous uveitis
- recurrent uveitis
- chronic
- associated with systemic signs or symptoms
- A history of unexplained systemic inflammation such as erythema nodosum.
- In some patients repeating investigation during followup may increase the yield of positive results.

General investigations included

- complete blood count
- ESR /CRP
- Syphilis serology –TPHA,VDRL
- Blood sugar and urine analysis
- Kidney and liver function tests in case where patient may need immunosuppressive or anti tubercular drugs.
- Specific investigations included

For infectious uveitis

1.TUBERCULOSIS

-Chest X ray

-Mantoux test

-Nucleic acid amplification

-sputum and cultures for M.tuberculosis

2.LEPROSY

-slit smear

3.SYPHILIS

- venereal disease research laboratory (VDRL)

-fluorescent treponemal antibody absorption test (FTA-ABS)

4.LEPTOSPIROSIS

-microagglutination test

-ELISA for leptospira antigens

B.PARASITIC DISEASES

ELISA for toxoplasma and toxocara.

C.VIRAL DISEASES

- HIV (WESTERN BLOT,ELISA)

-Aqueous and vitreous fluid for PCR(herpes zoster ,cytomegalovirus,herpes simplex)

II)For non infectious uveitis

1.Juvenile idiopathic arthritis(JIA)

-ESR

-ANA

2.HLAB27 related uveitis

-HLAB27 typing

-X-ray sacroiliac joints

3.Sarcoidosis

-chest X ray

-Angiotensin converting enzyme

-serum or urine calcium

-pulmonary function tests

-bronchoalveolar lavage

4.Collagen vascular diseases

i)systemic lupus erythematosus

-ANA

-dsDNA,ssDNA

-Anti SM.Anti RNP

ii)wegeners granulomatosis

-Chest X ray

-Xray sinus film

-cANCA

iii)polyarteritis nodosa

-serum eosinophils

-pANCA

5.other diseases

i)Behcets disease

-FFA

-HLAB51

-pathergy test

ii)Vogt koyanagi harada syndrome

-USG

-FFA

iii)Sympathetic ophthalmia

-USG

-FFA

-Enucleation of the blind eye and histopathology

iv)Fuchs heterochromic iridocyclitis

-currently no specific test

v)Retinal vasculitis

-ESR

-VDRL/FTA-ABS

-Sarcoidosis investigations

-viral work up

-toxoplasma and tuberculosis workup

-vitreous biopsy for lymphoma

vi)White dot syndrome

-FFA

vii)Intraocular lymphoma

-vitreous biopsy for cytology

-MRI

-lumbar puncture

-CSF cytology

5|TREATMENT OF UVEITIS

A] BASIC PRINCIPLES OF TREATING UVEITIS

i)To treat infectious causes of uveitis specificially (ocular TB,syphilis)

ii).Non infectious uveitis treated with steroids (not indefinitely but to taper and stop)in any appropriate form to control or abolish inflammation.

iii)To use immunomodulatory agents if patient has steroid induced complications.

B]*TREATMENT OF UVEITIS:*

In ***anterior uveitis,***

i))cycloplegics such as atropine 1% drops thrice daily. In milder cases, weaker, shortacting agents such as cyclopentolate 1% thrice daily or homatropine 2% thrice daily may be used.

Cycloplegics act in three ways:

- by keeping the iris and ciliary body at rest
- by diminishing hyperaemia and
- by preventing the formation of posterior synechiae

breaking any that have already formed

ii) Corticosteroids

Corticosteroids usually administered topically as drops or ointment or as subconjunctival injections.It controls the inflammation in the acute phase.

If uveitis is not responding well to frequent topical steroids then periocular repository steroids (e.g. 40–80 mg methylprednisolone or

triamcinolone) can be injected in the sub-Tenon space. Ideally, before injecting depot steroids periocularly, it is better to use topical steroids for 6 weeks to ensure that the patient is not a steroid responder .Indications for systemic steroid therapy include a severe uveitis, or where there is no improvement on maximal topical and repository steroids.

iii) ***Systemic immunosuppressives*** or immune-modulating agents such as methotrexate, cyclophosphamide and cyclosporine may be needed in some cases which do not respond to conventional steroid therapy or if the patient develops side effects due to steroids. Rheumatologist consultation is necessary before starting them.

iv) ***Specific treatment*** directed to the underlying disease once the aetiology is identified. For example, tuberculosis to be treated with standard antitubercular therapy (isoniazid, rifampicin, ethambutol and pyrazinamide).

C)TREATMENT OF SEQUELAE AND COMPLICATIONS[8]

i)Secondary glaucoma is one of the serious complications of iridocyclitis. The most effective treatment is to intensify atropinization to prevent posterior synechiae formation. Corticosteroids, topical aqueous suppressants and acetazolamide given systemically to reduce the intraocular pressure. . Pilocarpine and latanoprost are contraindicated as uveitis may be exacerbated. Laser iridotomy is essential in all cases with annular synechiae. But laser iridotomy to be avoided in active uveitis.

ii) ***Cataract*** can be removed surgically after the uveitis has been quiescent for at least 3 months.

iii)Band keratopathy can be treated with excimer laser photoablation (phototherapeutic keratectomy or PTK) or removed mechanically by chelating with sodium EDTA.

iv)***Cystoid macular edema*** can be treated with intravitreal dexamethasone.

6] SPECIFIC TYPES OF UVEITIS

A]Bacterial Uveitis

i)Tuberculosis[2,4]

It can affect any part of the uveal tract.

Tuberculous iritis

It is granulomatous type of uveitis. It can occur in a military and a conglomerate .Miliary type is seen in severely debilitated patients with impaired immunological responsiveness and if there is massive dissemination of bacilli.It is seen as small yellowish white nodule surrounded by numerous smaller satellites usually near the pupillary margin.In conglomerate type there is large yellowish white nodule with numerous satellites.

Tuberculous Choroiditis

Tuberculous choroiditis occurs in acute miliary and chronic forms of the disease. It can either manifest as choroidal tubercles (approximately 0.3–3.0 mm) or as tuberculomas . Choroidal tubercles appear as three or four round, pale yellow spots, usually near the disc,approximately 0.3–3.0 mm. Tuberculomas which appear as a single large subretinal choroidal mass, often more than two disc diameters in size.

Investigations

The Mantoux test is generally used for diagnosis. A positive result does not prove that the ocular condition is tuberculous. A negative result makes the diagnosis of allergic tuberculosis unlikely. Anergy to tuberculo protein

occurs in patients suffering from sarcoidosis, Hodgkin disease and other immune deficiency states. The Mantoux test is only a presumptive test. Definitive diagnostic tests are direct demonstration of *M. tuberculosis* on histopathological examination, cultures or polymerase chain reaction (PCR) on samples obtained from the ocular tissues.

Treatment

Rifampicin , isoniazid, ethambutol and pyrazinamide, i.e. a four-drug regimen is prescribed. Ethambutol and pyrazinamide are stopped after 2 months and the other drugs are continued for 6 months. Ethambutol may impair vision leading to a decrease in visual acuity and red–green colour blindness. Patients should be warned about possible visual symptoms . Optic neuropathy is rare if the dosage of ethambutol is less than 15 mg/kg/day and more likely if the dose exceeds 25 mg/kg/day. As soon as symptoms of toxic optic neuropathy develop, the drug should be stopped [8].

ii)Spirochaetal Uveitis [2,4]

a)Syphilis

The eyes can be affected in any stage of syphilis in various ways affecting the conjunctiva, cornea, sclera, uvea, optic nerve and central nervous system and the disease has been recognized to be a great ‘masquerader’. It is recommended that tests for both HIV and syphilis be performed if either is found to be positive.

Syphilitic Iritis

Syphilitic iritis manifests itself in two forms. A non-specific ***iritis*** or ***iridocyclitis,*** which can be granulomatous or non-granulomatous.It occurs typically in the secondary stage of the disease.It begins soon after the skin eruptions appear, usually within the first year after infection, but not before the third month.

In light-coloured irides, prominently dilated iris vessels termed ***roseola*** is seen. It is probably due to treponemal emboli causing local vascular obstruction, dilatation and tortuosity .It is a distinctive feature. Posterior synechiae can occur. The iritis lasts for 2–8 weeks .It usually does not recur. Usually unilateral and fellow eye involvement is seen in the absence of early syphilitic treatment.*Treponema pallidum* has been found in the aqueous.

A 'plastic' iritis also occurs in congenital syphilis.It is usually seen accompanying interstitial keratitis . It also occurs in young babies with congenital syphilis without any corneal complication, but usually with large nodules or gummata on the iris.

An acute 'plastic' iritis may occur as a ***Jarisch–Herxheimer reaction*** 24–48 hours after the first therapeutic dose of penicillin.It is probably due to the flooding of the system with treponemal toxins.

Gummatous Iritis

It occurs late in the secondary or rarely during the tertiary stage, and is characterized by the formation of yellowish red, heavily vascularized nodules

near the pupillary and ciliary borders of the iris. They are usually associated with much exudation and broad synechiae.

Syphilitic Choroiditis and Chorioretinitis

This may occur as disseminated choroiditis, peripheral choroiditis, diffuse chorioretinitis, neuroretinitis, big blind spot syndrome, exudative maculopathy, uveal effusion, vasculitis, central retinal vein occlusion, retinal necrosis. In HIV-infected individuals, lesions resembling placoid pigment epitheliopathy and atypical serpiginous choroidopathy. Vitritis is common and severe.

The ***diagnosis*** of syphilis can be established either by

(i) direct demonstration of the organism with darkfield microscopy or using direct fluorescent antibody which has high specificity but low sensitivity

(ii) ***serological tests***:For ocular lesions serological tests are mainly used. The serological tests are also classified into two broad categories :

1) ***Non treponemal tests***: They detect antibody to lecithin or cardiolipin which is a cholesterol antigen . Hence non-treponemal [such as the Venereal Disease Research Laboratory (VDRL) and Rapid Plasma Reagin (RPR) tests] have lower specificity. But are useful as screening tests and to monitor response to treatment. They are not known useful in

detecting late latent and tertiary syphilis, as false-negative results are common..

2)***Treponemal tests:***They detect antibodies specifically against treponemal antigens [Fluorescent Treponemal Antibody Absorption (FTA-ABS) tests and Treponemal HaemAgglutination (THA) tests]. The treponemal tests are more specific and are used to confirm the diagnosis after a positive screening test result and to detect late latent and tertiary syphilis.

It is mandatory in any case of ocular syphilis with a positive serological test to look for evidence of neurosyphilis by CSF examination. CSF leucocytosis with elevated protein concentration and a positive CSF-VDRL test are considered confirmatory evidence of neurosyphilis [4,8].

TREATMENT[8]

Stage	Primary treatment	Alternative treatment
Primary ,secondary,early latent syphilis	Benzathine penicillin G intramuscular 2.4 MU single dose	Doxycycline100mg BD oral for 2 weeks or tetracycline 500mg QID for 2 weeks
Late latent or latent syphilis of uncertain duration ,tertiary syphilis in the absence of neurosyphilis	Benzathine penicillin G intramuscular 2.4 MU weekly for 3 doses	Doxycycline100mg BD oral for 4 weeks or tetracycline 500mg QID for 4 weeks
Neurosyphilis	Aqueous penicillin G intravenous 18-24 MU per day given as 3-4 MU every 4 hrs for 10-14 days	Procaine penicillin 2.4 MU intramuscular daily for 10 to 14 days and probenecid 500mg oral QID for 10 to 14 days
Congenital syphilis	100000-150000 MU /kg /12 hrly for first 7 days of life then every 8 hrly for 10 days.	Procaine penicillin G50000 MU/kg/dose IM as single dose for 10 days

b)Leptospirosis

Infection with the leptospira occurs by contact or ingestion of water contaminated with the urine of infected domestic and wild animals. People in developing countries who swim, bathe or work in contaminated water, veterinarians and farmers are at high risk for contracting this infection. Uveitis occurs in up to 10% of cases and is often associated with a hypopyon. Diagnosis is by antileptospira antibody tests on blood and culture of live organisms. Treatment is with topical steroids and cycloplegics along with intravenous penicillin in severe infections and oral doxycycline in milder cases.

iii]Viral Uveitis

a)Acute Retinal Necrosis and progressive outer retinal necrosis

Acute retinal necrosis and **progressive outer retinal necrosis** is caused by infection with the varicella zoster virus or herpes simplex viruses (both I and II).

Acute retinal necrosis	Progressive outer retinal necrosis
Occurs in immunocompetent individuals	Occurs in immmunocompromised
Initially starts in the periphery of retina	Initially starts at the posterior pole and macula
Involves all layers of retina eventually leading to retinal detachment	Involves the outer retinal layers
Inflammation is severe(vitritis is severe)	Inflammation is mild or absent

The condition is bilateral in 80% and in most cases fellow eye involvement occurs within 3 months. **Diagnosis** is mainly clinical. A definitive diagnosis histopathological examination of biopsy specimens of the vitreous and retina and testing of ocular fluids such as the vitreous or aqueous by polymerase chain reaction.

TREATMENT

ACYCLOVIR	Induction intravenous 10 mg/kg/day in 3 doses IV for 10-14 days;maintainence oral 800mg 5 times daily for 3 months in VZV infection/one half dose for HSV infection
Valacyclovir	Oral-1 g three times a day for 3 months in VZV infection/ one half dose for HSV infection
Ganciclovir	Implant delivers drug for 6 to 8 months
Foscarnet	Intravitreal 2.4 mg in o.1ml twice a week for 2-3 weeks

Retinal detachment can be surgically corrected by vitreoretinal surgery with silicone oil tamponade.Silicone oil is the repair modality of choice[8]

b)**Cytomegalovirus**

Cytomegalovirus is an opportunistic pathogen in immunocompromised individuals .It is the most common infection in AIDS seen when the CD4 count falls below 50. ***Cytomegalovirus retinitis*** is characterized by greyish patches with irregular sheathing of adjacent blood vessels and vitritis. There are

superimposed haemorrhages followed by healing and retinal atrophy. In children, infantile cytomegalovirus disease may produce severe brain damage with mental deficiency. The ocular lesion in children varies from an isolated central retinal lesion to a chorioretinitis with disorganized globe.

TREATMENT

Ganciclovir	Intravenous-induction5mg/kg twice daily for 2 weeks then once daily.	maintainence oral 1 g three times daily or intravitreal 2 mg in 0.1ml once a week as maintainence
Valganciclovir	Oral induction 900 mg twice daily for 21 days	900mg once daily maintainence
Foscarnet	Intravenous induction 90mg/kg every 12 hrs for 2 weeks	Intravenous 90mg/kg once daily or intravitreal 2.4 mg in 0.1ml twice a week for 2-3 weeks
Acyclovir	Intravenous 5mg/kg once a week for 2 weeks	Intravenous 5mg/kg for every two weeks or intravitreal 15-20ug every 6 weeks

Ganciclovir is effective in controlling this infection, but requires an indefinite maintenance therapy . The average rate of survival of AIDS patients

has improved significantly after the introduction of HAART (Highly active anti-retroviral therapy) .Hence incidence of CMV retinitis has also decreased. Ganciclovir implants (slow-release) can be inserted into the eye by suturing the implant to the sclera and allowing it to lie suspended in the vitreous cavity [4,8].

iv)Fungal Uveitis can be exogeneous or endogeneous.

Fungal uveitis due to *Candida albicans* occurs when the immunity is compromised. Chorioretinitis with infiltration into the vitreous may be produced by haematogenous spread from the alimentary tract. Treatment is with initially with systemic antifungal therapy. Intravitreal antifungal agents (amphotericin B or voriconazole) and pars plana vitrectomy are reserved for cases that fail to respond to systemic therapy [4].

v)Parasitic Uveitis

a)Toxoplasmosis

This is a protozoan infection derived mainly from cats. The oocysts of *Toxoplasma* affect primarily the retina and choroiditis is secondary i.e. retinochoroiditis is the typical manifestation. It is probable that in infants the primary site is most often the retina which is involved in association with the brain. The retinal picture is characteristic enough to suggest the diagnosis in infants. There are bilateral and frequently multiple chorioretinal lesions in the fundus, the macular area being particularly involved. The entire thickness of the retina and choroid is destroyed in a necrotizing inflammation so that there is a

punched-out, heavily pigmented scar . Such infants are usually acutely ill with a history of convulsions and, hydrocephalus, areas of calcification in the brain and mental retardation.

In adults, toxoplasmosis probably constitutes one of the most common cause of retinochoroiditis .The lesion is usually widespread and characterized by severe, recurrent attacks, usually at the edge of a previous scar, associated with exudation into the vitreous. Encysted trophozoites are shielded from the lymphoid system but periodic rupture of the cysts releases protozoa which provoke a secondary immunological response.Toxoplasmosis can also be acquired. Pathologically, the characteristic feature is a wide area of necrosis of the retina in which the parasites may be found, either free or encysted. Apart from demonstration of the parasite, diagnosis depends on serological tests [the Sabin–Feldman dye test with a titre greater than 1:16, the complement fixation (CF) test, the indirect haemagglutination (IHA) test and ELISA test for IgG and IgM] [2,3,4].

TREATMENT

1.TRIPLE THERAPY	DOSE	ADVERSE EFFECTS
i)Pyrimethamine	Loading dose 50 -100 mg ,25-50 mg oral daily	Add folinic acid 5mg to prevent leucopenia/thrombocytopenia due to inhibition of folic acid metabolism
ii)Sulphadiazine	Loading dose 2-4 g,1g 4 times oral daily	In new born with congenital disease –sulpha and pyrimethamine for one year
2.CLINDAMYCIN	300mg 4times a day	Can be used alone or in combination.Pseudomembranous colitis is a reported adverse reaction.
3.TRIMETHOPRIM/ SULPHAMETHOXAZOLE	160mg/800mg twice daily	Sulpha drugs safe in first 2 trimester
4.SPIRAMYCIN	250mg oral daily	In newly acquired infection in pregnancy
5.ATOVAQUONE	750 mg four times daily	Usually used in combination with sulpha/pyrimethamine and clindamycin can be used in HIV/AIDS

Cycloplegics and topical steroids are used to control any anterior segment inflammation, if present. In any case with suspected toxoplasmosis, systemic corticosteroids should never be used alone without appropriate antimicrobial treatment. If medical measures fail, photocoagulation may protect a threatened macula [8].

vi)Immunological Uveitis

a)Ankylosing Spondylitis and Uveitis

Ankylosing spondylitis is a chronic, progressive, pauciarticular (involvement of four or less than four joints) disorder involving the sacroiliac and the posterior intervertebral joints. The onset is insidious with intermittent attacks of arthralgia. Males around 30-40 yrs are more frequently affected than females. There is a strong association with the HLA-B27 antigen.

Acute, recurrent type of iridocyclitis is seen. Iridocyclitis is seen in 25% of patients [3].

b)Reiter Disease and Uveitis

This syndrome affects young males .It is associated with a high incidence of the HLA-B27 antigen. Rheumatic manifestations (pauciarticular pattern usually affecting large joints) occur in 98% of patients, genitourinary in 74%, ophthalmic in 58% and mucocutaneous in 42%. It tends to affect patients who present with non-specific urethritis, postgonococcal urethritis or dysentery. *Chlamydia* have been isolated from the urethral discharge in about 50% of

cases. There is an association with dysentery due to *Shigella flexneri.* It is possible that the Shigella antigen may produce an auto-hypersensitivity in patients who have the HLA-B27 antigen. The urethritis associated with Reiter disease requires administration of oral tetracycline in a dosage of 500 mg four times a day. It is also essential that all sexual partners be examined for genital infection [2,4].

c)Juvenile Chronic Arthritis

Juvenile chronic arthritis also known as juvenile rheumatoid arthritis is defined as chronic arthritis beginning at below 16 years of age. There are four different subsets of disease which differ in presentation and management.

The polyarticular subset of JCA which most resembles adult rheumatoid arthritis is least common. Adolescent females are affected with bilaterally symmetrical polyarticular involvement of the small joints of the hands and feet, associated with a positive rheumatoid factor (RF). Iritis is not common. Scleritis is a known manifestation. Dry eye is another important ocular problem.

The pauciarticular subset of JCA involves mainly girls 2–6 years of age, who are positive for antinuclear antibody (ANA) and negative for RF. Ocular involvement is common (50% of patients), predominantly manifesting as a bilateral chronic uveitis of insidious onset, often with minimal signs such as mild pain and redness. The disease is chronic, often missed unless specifically

looked for, and leads to complications such as glaucoma, cataract, posterior synechiae, pars planitis and band keratopathy [3,4].

Another pauciarticular form of JCA is a spondyloarthropathy affecting males over 12 years of age who are positive for the HLA-B27 antigen. This group is affected by an acute unilateral iritis of sudden onset, which is generally self-limited, resolving with treatment in few weeks.

The fourth subset of JCA is Still disease which affects adolescents, more commonly females, and presents with prominent systemic features of high fever, leucocytosis, skin rash, lymphadenopathy, hepatosplenomegaly, arthralgias and a raised ESR. Ocular involvement is uncommon but iritis has been reported to occur [2,4].

d)Behcet Syndrome

This disease is characterized by severe recurrent iridocyclitis, usually characterized by a hypopyon.It is also associated with obliterative retinal vasculitis. It is accompanied by ulcerative lesions in the conjunctival, oral and genital mucosae, along with neurological and articular manifestations. It is seen in young adults. This syndrome of two types: the first associated with herpetiform ulcers in the mouth and the second with aphthous ulcers without evidence of an infective basis. There is a significant association with the HLA-B5 antigen. No specific treatment is known and only non-specific measures are available such as systemic steroids or immune suppressives [2,4]

e)Sarcoidosis

Sarcoidosis is a systemic disease manifested by infiltration of the affected tissue by non-caseating tuberculoid granuloma, which either resolve or are replaced by hyalinised scar tissue. It is associated by a granulomatous iridocyclitis. Uveitis may present as one of the following:

1. ***Acute*** iridocyclitis, which is often a presenting sign of sarcoidosis in association with hilar lymphadenopathy and erythema nodosum.
2. ***Chronic*** iridocyclitis, where multiple discrete granulomata develop in the iris in older individuals; it has a chronic course and poor prognosis.
3. ***Posterior uveitis*** with choroidal involvement, occasionally associated with granulomata in the retina.
4. ***Uveoparotid fever*** or ***Heerfordt's disease***, which is bilateral and characterized by a simultaneous involvement of the entire uveal tract, parotid gland and frequently the cranial nerves. It appears in young persons between 10 and 30 years of age,.It commences with malaise and fever, sometimes accompanied by a skin rash resembling erythema nodosum.Patients present with a granulomatous iridocyclitis or with a painful swelling of the parotid resembling mumps. Subsequently diplopia due to palsy of the ocular motor nerves or facial paralysis can occur. The disease is self-limiting . The parotid swellings last for 6 weeks to 2 years and eventually subside.

Other features are sarcoid granulomata which are conjunctival nodules in the lower fornix, calcification of the cornea associated with hypercalcaemia and keratoconjunctivitis sicca [4].

The diagnosis is made by the presence of other systemic manifestations such as pulmonary changes and areas of rarefaction in the bones. Investigations include a chest X-ray, gallium scan of the head, neck and mediastinum for increased uptake, detection of raised levels of serum angiotensin-converting enzyme (ACE), estimation of serum lysozyme, serum electrophoresis for hypergammaglobulinaemia and biopsy of the skin or conjunctival nodules, palpebral lobe of the lacrimal gland if enlarged, lymph node or lung. Biopsy specimens should be stained with an acid fast as well as a methenamine–silver stain to rule out the differential diagnosis of tuberculosis and possible fungal infection. Patients with sarcoidosis often fail to react to an intradermal injection of tuberculin indicating a disturbance of immune function. In the Kveim test, the skin of patients with sarcoidosis responds to an injection of a suspension of sarcoid tissue by developing a localized granuloma[4].

f)Uveitis Associated with Vitiligo, Poliosis and Deafness (Vogt–Koyanagi–Harada Syndrome)

This is a bilateral condition .It is common in pigmented races Asians, Hispanics and Africans. It occurs in young adults. It was previously categorized separately as Vogt–Koyanagi syndrome (poliosis, vitiligo, alopecia and chronic anterior uveitis) and Harada disease (bilateral posterior uveitis with exudative

detachments and CSF abnormalities such as pleocytosis), the two are now clubbed together as the distinction in clinical pattern is not always present. There is a chronic granulomatous iridocyclitis, with an exudative choroiditis, which often leads to an exudative detachment of the retina. The ocular inflammation is accompanied by a patchy depigmentation of the skin and whitening of the hair, eyebrows and eyelashes (poliosis). The cause is unknown but may be an autoimmune response against melanocytes. Inflammation is controlled with high doses of systemic steroids. In case steroids fail to produce an adequate clinical response, or if the patient develop side effects, cytotoxic and immunosuppressive drugs can be given inspite of steroids [2].

g)Heterochromic Iridocyclitis of Fuchs

This is a low-grade chronic cyclitis. The features are lightening of the colour of the affected iris and the presence stellate keratic precipitates on the cornea. The latter distinguish the condition from congenital heterochromia. The iris becomes atrophic, loses its markings and readily transilluminates in circumscribed areas, and a cataract frequently develops. The condition is usually said to be associated with some disturbance of the sympathetic nerve supply which controls the chromatophores, accounting for the depigmentation and the tone of the blood vessels. When the blood vessels are dilated, white cells escape and get deposited on the cornea as precipitates. The cataract has a good operative prognosis, but secondary glaucoma may develop. During cataract surgery, fine filiform haemorrhage from the opposite angle has been

noticed to occur as soon as the anterior chamber is opened—this is referred to as ***Amsler sign*** [4].

h)Masquerade Syndromes

These include cases which mimic anterior or posterior uveitis in their clinical features but the aetiopathogenesis is different, usually being neoplastic . Acute leukaemia, iris melanoma, juvenile xanthogranuloma, small round cell malignancies, anterior segment ischaemia, reticulum cell sarcoma or large cell lymphoma are some of the conditions which can present in this manner. In addition to the investigations in general uveitis, cytological and immunohistological studies of aqueous and vitreous specimens assist in establishing the diagnosis [2,4].

vii)Posner Schlossman syndrome[4]

It is also known as glaucomatocyclitic crisis .It is a disease characterised by acute ,unilateral recurrent attacks of elevated intraocular pressure accompanied by mild anterior chamber inflammation.The pathophysiology is unknown .Treatment is focussed on controlling the intraocular pressure and decreasing the inflammation.While an attack usually resolves without an sequelae,repeated attacks over time may lead to long term glaucomatous damage.

viii)Sympathetic ophthalmia

In this condition serious inflammation attacks the sound eye after injury (including intraocular surgeries)to the other eye.It has become rare in the recent

years. It usually results from a penetrating wound ,occurring in 0.2%-0.5% of cases.Incarceration of the iris or lens capsule are more likely to set up sympathetic ophthalmitis than others.It can occur at any age.It usually begins 4-8 weeks after the injury to the first eye (the exciting eye)has taken place .The etiology is unknown.It is usually considered as autoimmune,T cell mediated disease.

Pathology:The pigment epithelium of the iris and ciliary body proliferates to form nodular aggregations called dalen fuchs nodule and the tissue become invaded by lymphocytes and epitheloid cells.

Clinical features:The exciting eye will always have signs of iridocyclitis.The onset of sympathetic ophthalmia in the second eye is characterized by photophobia,irritation.The first sign is retrolental flare.When fully developed the signs and symptoms of granulomatous uveitis is present.

Treatment:Intravenous methylprednisolone 1 g followed by 100 mg orally tapered off slowly. This along with use of topical steroids and topical cycloplegics.The ee should be watched over for years even after the completion of treatment[4].

7]CHALLENGES FACED IN DEVELOPING COUNTRIES

Uveitis is a potentially blinding disease in children and adults.Accurate treatment of severe inflammation preserves vision as well as prevents systemic morbidity and mortality.Compliance of the patient is very important to prevent the morbidity.In developing countries like India socioeconomic status of the patient decides the compliance of the patient.

India presents unique problems becaquse of varying socio economic ,demographic and morbidity patterns.The prevalence and severity of diseases in economically deprived population vary from those in rest of the world because of lack of good primary health care ,poor affordability and poor compliance.As an ophthalmologist we also have to meet the added challenge of handling these problems in addition to managing uveitis.

8|AIM

To study the etiological profile and clinical patterns of uveitis.

9|MATERIALS AND METHODS

Study design: Cross sectional study

Sample size :50

Source of data: A series of patients with uveitis attending the ophthalmology outpatient department in tirunelveli medical college for a period of 18 months from October 2017 to April 2019.

Inclusion criteria:

-All patients with anterior ,intermediate ,posterior and panuveitis.

-Both male and female.

-Any age group with uveitis.

Exclusion criteria

-Uveitis with trauma as the etiology.

- Uveitis following intraocular surgery.

50 patients with uveitis were enrolled in the study after getting informed consent.

A detailed history regarding age, occupation, residence, known systemic diseases past or present was elicited. Patients were questioned about backache/joint problems, skin diseases, respiratory diseases, neurological

diseases, gastrointestinal diseases, oral and genital ulcers and sexually transmitted diseases.

A thorough ocular examination included best corrected visual acuity (BCVA), slit lamp examination (SLE), indirect ophthalmoscopy (IDO), applanation tonometry(AT), gonioscopy. In addition, fundus fluorescin angiography(FFA), optical coherence tomography(OCT)B scan ultrasonograph were performed if needed .

Investigations were done in all cases of

- intermediate uveitis

-posterior uveitis

-diffuse or bilateral uveitis

- granulomatous uveitis

-recurrent uveitis

-bilateral uveitis

-chronic uveitis

- associated with systemic symptoms or signs .

General investigations included

-complete blood count

-ESR /CRP

-Workup for tuberculosis,syphilis,sarcoidosis

-Blood sugar and urine analysis

-Kidney and liver function tests in case where patient may need immunosuppressive or anti tubercular drugs.

Specific investigations included

For infectious uveitis

A]Bacterial

1.TUBERCULOSIS

-Chest X ray

-Mantoux test

-sputum and cultures for M.tuberculosis

2.LEPROSY

-slit smear

3.SYPHILIS

- venereal disease research laboratory (VDRL)

-fluorescent treponemal antibody absorption test (FTA-ABS)

4.LEPTOSPIROSIS

-microagglutination test

-ELISA for leptospira antigens

B]Parasitic diseases

ELISA for toxoplasma and toxocara.

C.Viral diseases

- HIV (WESTERN BLOT,ELISA)

-Aqueous and vitreous fluid for PCR(herpes zoster ,cytomegalovirus,herpes simplex)

II)For non infectious uveitis

1.Juvenile idiopathic arthritis(JIA)

-ESR

-ANA

2.HLAB27 related uveitis

-HLAB27 typing

-X-ray sacroiliac joints

3.SARCOIDOSIS

-chest X ray

-Angiotensin converting enzyme

-serum or urine calcium

-pulmonary function test

4.COLLAGEN VASCULAR DISEASES

i)systemic lupus erythematosus

-ANA

-dsDNA,ssDNA

ii)wegeners granulomatosis

-Chest X ray

-Xray sinus film

-cANCA

iii)polyarteritis nodosa

-serum eosinophils

-pANCA

5.other diseases

i)Behcets disease

-FFA

-HLAB51

-pathergy test

ii)Vogt koyanagi harada syndrome

-USG

-FFA

iii)Sympathetic ophthalmia

-USG

-FFA

-Enucleation of the blind eye and histopathology

iv)Fuchs heterochromic iridocyclitis

-currently no specific test

v)Retinal vasculitis

-ESR

-VDRL/FTA-ABS

-Sarcoidosis investigations

-viral work up

-toxoplasma and tuberculosis workup

-vitreous biopsy for lymphoma

vi)Intraocular lymphoma

-vitreous biopsy for cytology

-MRI

-lumbar puncture

-CSF cytology

Routine blood investigations and baseline workup like chest x ray, mantoux test, serum angiotensin converting enzyme (ACE), serum calcium levels, venereal disease research laboratory (VDRL),fluorescent treponemal antibody (FTA-ABS), was carried out. Anti nuclear antibodies (ANA)rheumatoid factor(RF),human leucocyte antigen(HLA)typing, enzyme linked immunosorbent assay (ELISA)for toxocara and toxoplasma,CT/MRI brain,herpes zoster/varicella zoster serology, cytomegalovirus serology ,aqueous and vitreous tap for PCR when indicated.

Following detailed history and ocular examination differential diagnosis list is compiled .The diagnosis of uveitis was made according to International uveitis Study group (IUSG) and Standardisation of Uveitis NOMENCLATURE(SUN)working group.

10]REVIEW OF LITERATURE

Rathinam et al[9] described that changing patterns of uveitis are seen from the same country at different periods of time.there is an upsurge in tuberculosis and serpiginous choroidopathy in India.The pattern changes is because of multiple factors including genetic ethnic,geographic and environmental factors .Therefore,awareness of such regional differences in the disease pattern is important in deriving a region specific list of differential diagnosis .It also helps in understanding the predictive values of diagnostic tests which in turn facilitate final diagnosis.

Biswas et al[10] compared uveitis patterns between two decades.Anterior uveitis was the most common anatomical type of uveitis.Intermediate uveitis was the second most common cause.Among cases of anterior uveitis idiopathic was the most common followed by HLAB27 associated anterior uveitis and tuberculosis.Among cases of intermediate uveitis idiopathic was the most common followed by tuberculosis and sacoidosis.The most common cause of posterior uveitis was tuberculosis.The most common cause of panuveitis was Vogt –koyanagi-harada syndrome.The number of idiopathic cases were reduced when compared to the previous study.The periodic analysis of epidemiology of uveitis is essential for comparison of treatment practices,management,prognosis,and complications of uveitis.

Biswas et al[11] reported patterns of uveitis in a referral uveitis clinic in India. Anterior uveitis was the most common type followed by posterior,intermediate and panuveitis.The most commonly affected age group was 30 -40 yrs.Children below 10 yrs and adults above 60 yrs were less commonly affected.Anterior uveitis was most commonly idiopathic.The most common cause of posterior uveitis was toxoplasmosis and panuveitis was Vogt koyanagi harada syndrome.He reported higher incidence of proven tuberculosis .

R Singh et al[12] reported the pattern of uveitis in a north indian tertiary eye centre. Anterior uveitis was the most common anatomical type of uveitis.Posterior uveitis was the second most common cause.Intraocular tuberculosis and toxoplasmosis were the most common causes of infective uveitis.He attributed the high incidence of tuberculosis to the use of PCR for the diagnosis of M.tuberculosis.Ankylosing spondylitis and serpiginous choroidopathy were the common non infective causes of uveitis.Intermediate uveitis were more often idiopathic.Serpiginous choroidopathy was the most common cause of posterior uveitis.Tuberculosis was the most common cause of panuveitis.Vogt Koyanagi Harada syndrome was the second most common cause of panuveitis.

Dogra et al[13] reported that anterior uveitis was the most common type followed by posterior,intermediate and panuveitis.Tuberculosis was the most common cause of infectious uveitis and HLAB27 associated uveitis was the most

common among noninfectious cause.The study reported a trend towards decrease in idiopathic etiologies of uveitis.

Dipankar Das et al[14] reported patterns of uveitis in north eastern India.Anterior uveitis was the most common type followed by posterior,intermediate and panuveitis.Seronegative spondyloarthropathy was the most common cause among anterior uveitis.Toxoplasmosis was the most common cause among posterior uveitis.Idiopathic was the most common cause among intermediate uveitis.tuberculosis and sarcoidosis were the other causes of intermediate uveitis.Vodt koyanagi harada syndrome was the most common cause among panuveitis.

Das D et al[15] reported changing patterns in uveitis in north east India in 2012 comparing with the previous study[14] done in the same population in 2005. Anterior uveitis was the most common type followed by posterior,intermediate and panuveitis.There was a drop in number of idiopathic cases in anterior and intermediate uveitis.This is because of the improved diagnostic accuracy through new modalities of investigations.There was an upsurge in TB related uveitis.HLA B27 related uveitis was the most common cause of anterior uveitis.Intermediate uveitis were more commonly idiopathic followed by tuberculosis.In posterior uveitis Tuberculosis was the most common cause.In panuveitis Vogt koyanagi Harada syndrome was the most common followed by

sympathetic ophthalmia.There was decrease in number of cases of Vogt koyanagi Harada syndrome and increase in sympathetic ophthalmia.

Plasule et al[16] reported patterns of uveitis in western India. anterior uveitis was the most common type followed by panuveitis,intermediate and posterior uveitis.Tuberculosis was the most common among infectious etiology and HLAB 27 related uveitis was the most common among the noninfectious causes.Panuveitis was mostly idiopathic followed by tuberculosis and VKH.Toxoplasmosis was the most common cause of posterior uveitis.

Venkatesh et al[17] reported patterns of uveitis at the apex institute for eye care in India. Anterior uveitis was the most common type followed by posterior uveitis,intermediate and pan uveitis. Tuberculosis was the most common among infectious etiology and ankylosing spondylitis was the most common among the noninfectious causes.

Parchand et al[19] reported tuberculosis as the most common cause of intermediate uveitis followed by idiopathic.Women were more commonly affected than men.The disease was bilateral in most of the patients.Cystoid macular edema was the most common complication followed by cataract and glaucoma.Cystoid macular edema was most common in recurrent cases.Recurrences were seen in cases treated with topical steroids only.

Rathinam et al[20] reported infectious diseases in developing world.Uveitis associated with leptospirosis was the most common etiology.Other causes were tuberculosis ,onchocerciasis.

Namperumalsamy et al[21] described uveitis associated with leptospirosis.Panuveitis was common followed by retinal periphlebitis,anterior uveitis.Uveitis associated with leptospirosis was either unilateral or bilateral.

Rathinam et al[23] described a presumed trematode granulomatous anterior uveitis as a common cause of pediatric granulomatous anterior uveitis in south India.

Henderly et al [24] reported that anterior uveitis was most common type followed b posterior uveitis, panuveitis and intermediate uveitis.Pars planitis(15.4%) was the single most frequently diagnosed uveitic entity accounted for 92 cases.

Mi H et al [28] reported trends in patterns of intermediate uveitis .Pars planitis was the most common type of intermediate uveitis (59%) followed by tuberculosis(31.8%).Cystoid macular edema was the most common complication following intermediate uveitis.

BenEzra et al[30] reported that uveitis in children and adolescents were comparatively low when compared to adults.Juvenile idiopathic arthritis and parasite infestation were the common etiologies associated with children. Intermediate uveitis was the most common anatomical diagnosis.

11] RESULTS

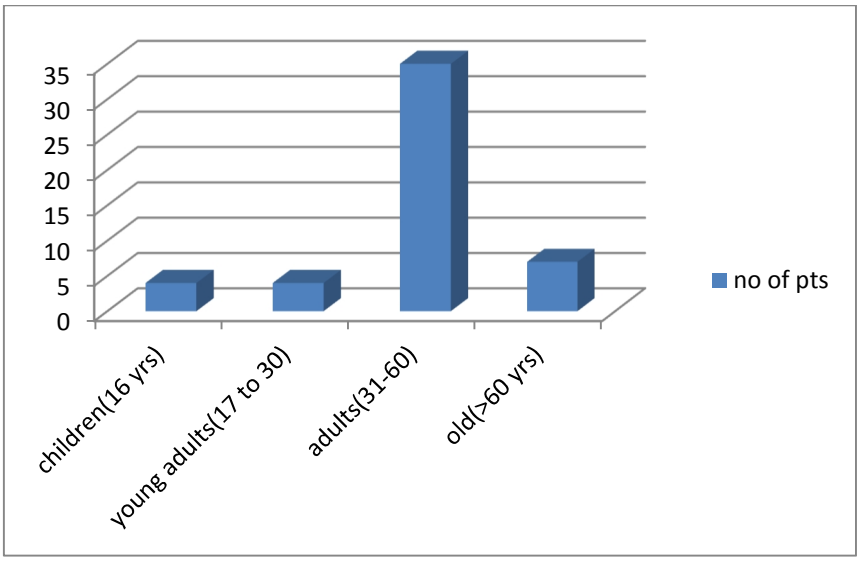


FIGURE 1:AGE WISE DISTRIBUTION OF UVEITIS

Figure 1 represents age wise distribution of uveitis. Among 50 patients with uveitis , 4 were children,4 young adults,35 adults and 7 were old .

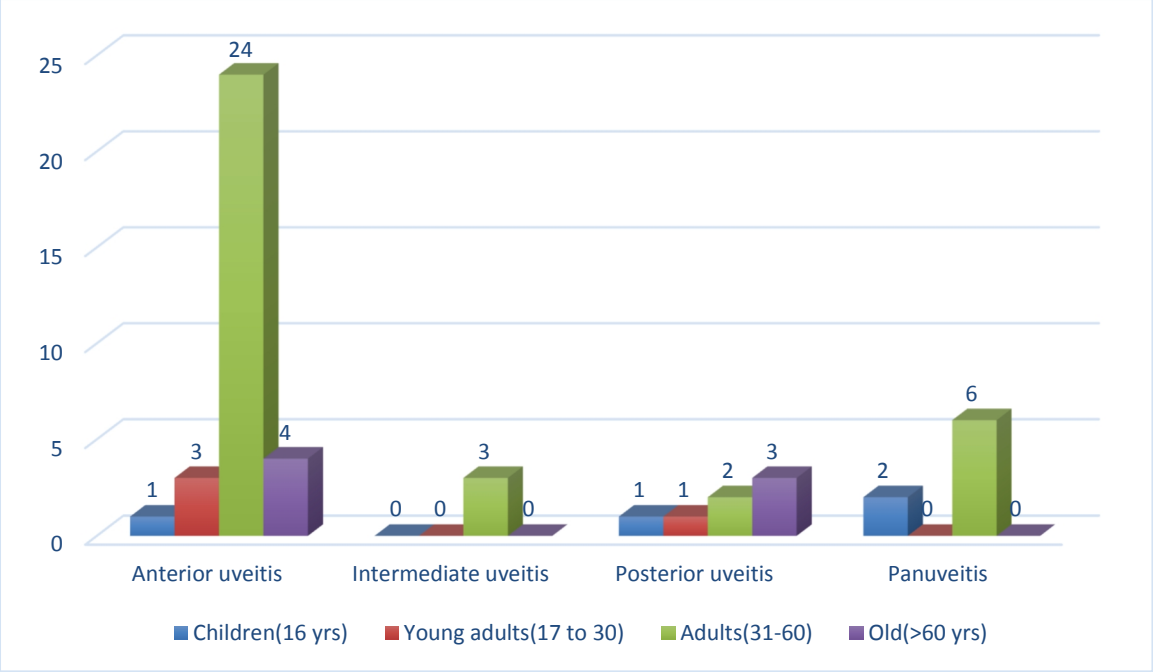


FIGURE 2:AGE WISE DISTRIBUTION OF DIFFERENT TYPES OF UVEITIS

Figure 1 represents age wise distribution of different types of uveitis.The most commonly affected age group among 32 patients with anterior uveitis were adults .Among 3 patients with intermediate and and 8 patients with panuveitis were adults(31 to 60 yrs).Among 7 patients with posterior uveitis,the most commonly affected age group was elderly(>60 years).

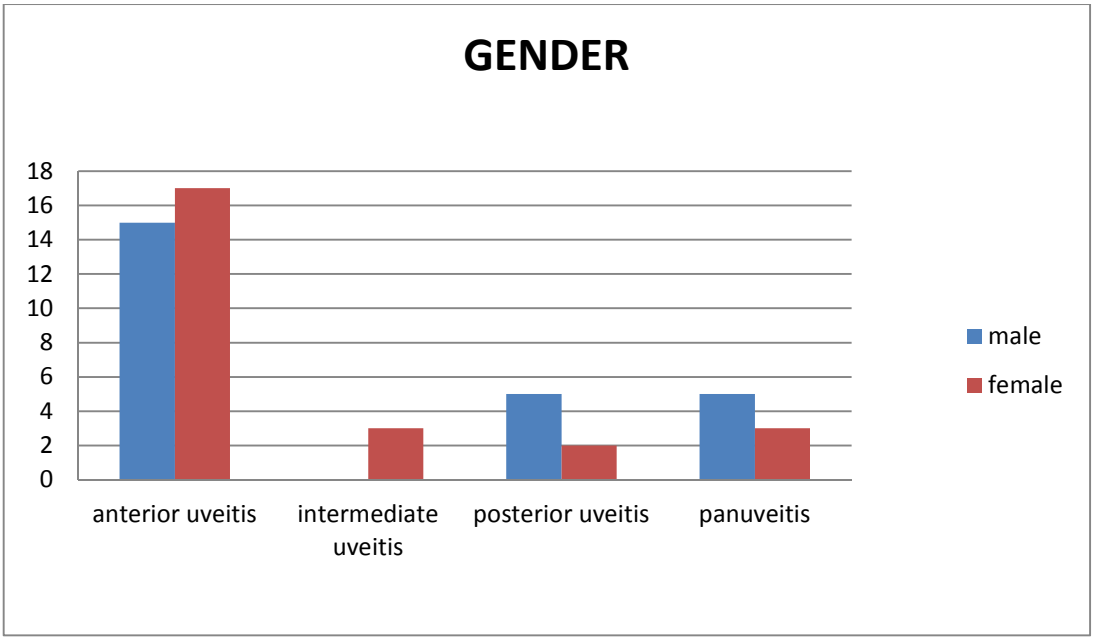


FIGURE 3: GENDER WISE DISTRIBUTION OF DIFFERENT TYPES OF UVEITIS

Figure 2 represents gender wise distribution of different types of uveitis.Among 32 patients with anterior uveitis,18 were female and 14 male .All three patients with intermediate uveitis were females.Among 7 patients with posterior uveitis,4 were male and 3 were female .Among 8 patients with 3 were female and 5 were male.

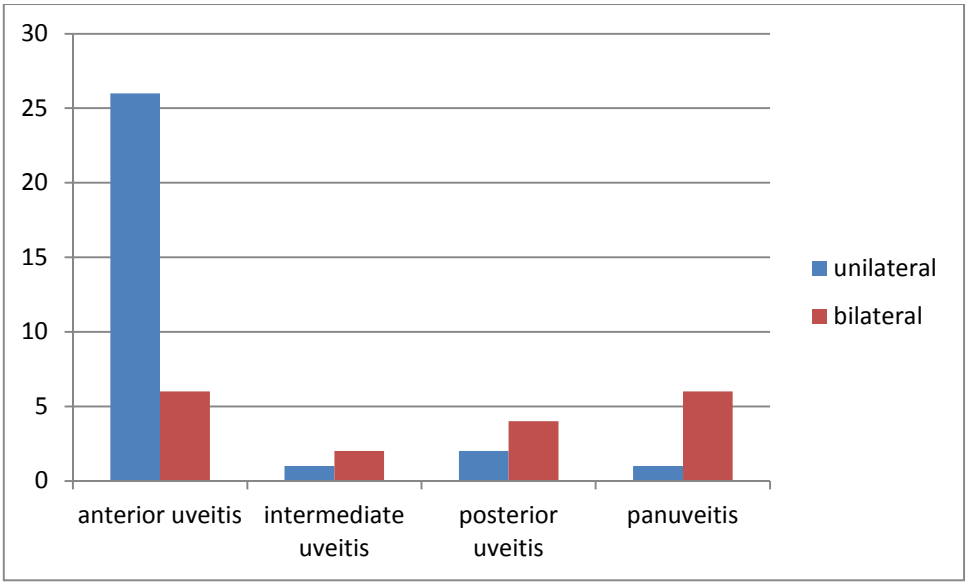


FIGURE 4:LATERALITY OF DIFFERENT TYPES OF UVEITIS

Figure 4 represents laterality of different types of uveitis . Among the 32 patients with anterior uveitis, 26 were unilateral and 6 were bilateral.In intermediate uveitis two patients were bilateral.Among 7 patients with posterior uveitis,2 were unilateral and 4 were bilateral.Among 8 patients with posterior uveitis,1 was unilateral and other 7 were bilateral.

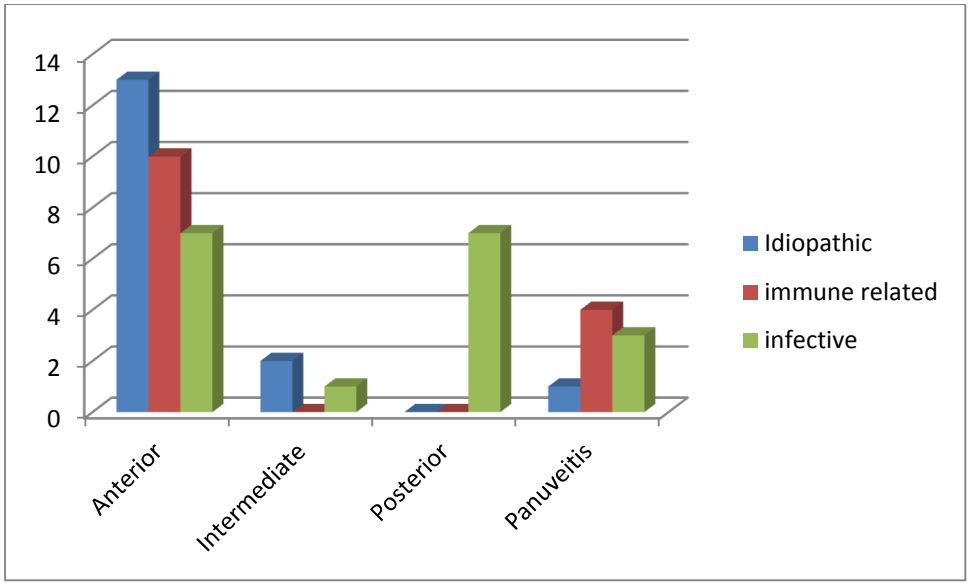


FIGURE 5:ETIOLOGICAL CLASSIFICATION OF DIFFERENT TYPES OF UVEITIS

Figure 4 represents etiological classification of different types of uveitis .Among anterior uveitis ,13 were idiopathic ,10 were immune related and 7 infective (I due to leprosy,1 syphilis,2 herpetic anterior uveitis,1 due to HIV,2 due to tuberculosis)and 2 were due to fuchs heterochromic iridocyclitis .In intermediate uveitis,2 cases idiopathic and 1 was infective due to tuberculosis.Among posterior uveitis ,all 7 cases were due to infective etiology.Among panuveitis 1case was idiopathic,4 cases were immune related (3 VKH and 1 sarcoidosis) and 3 were infective etiology(due to tuberculosis).

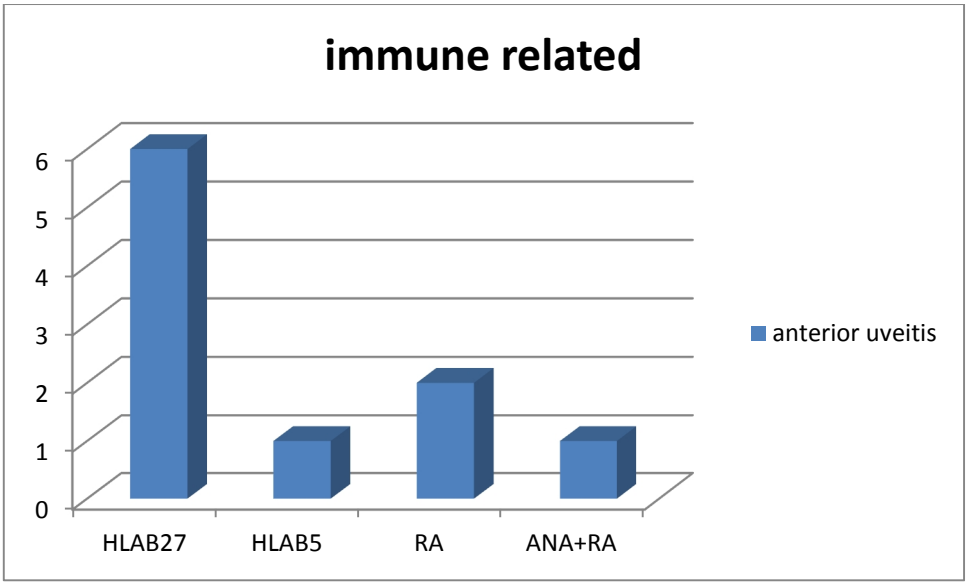


FIGURE 6:DISTRIBUTION OF IMMUNE RELATED ETIOLOGY IN UVEITIS

Figure 6 represents the distribution of immune related etiology in uveitis.HLA B27 was positive in 6 patients of anterior uveitis.HLA B5 was positive in one patient with anterior uveitis(Behcet) Rheumatoid factor was positive in two patients.ANA and rheumatoid factor was positive in one patient.

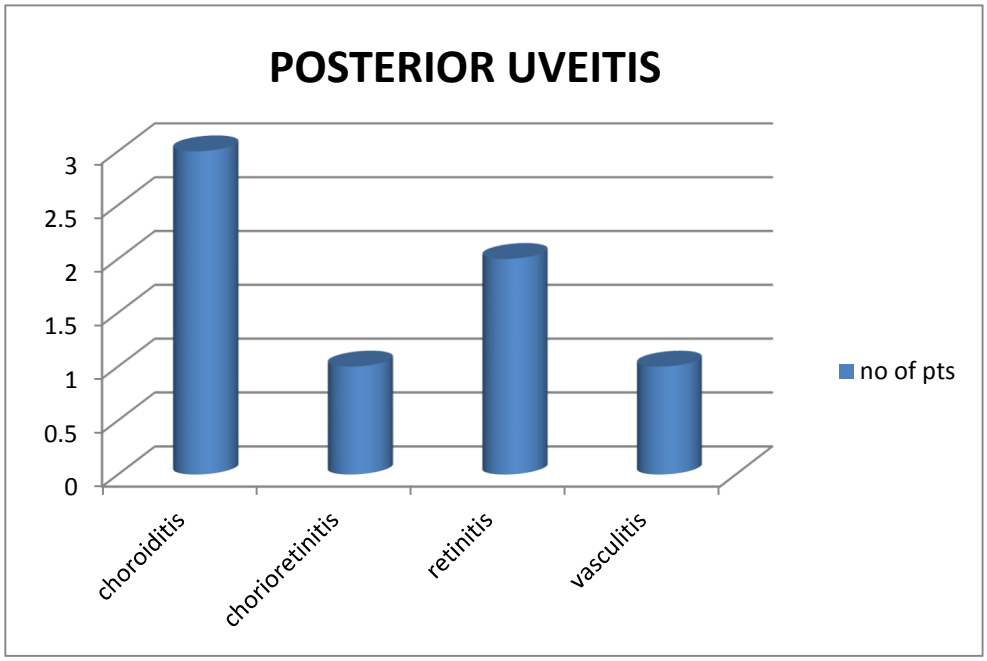


FIGURE 7 REPRESENTS DIFFERENT TYPES OF POSTERIOR UVEITIS

Figure 7 represents different types of posterior uveitis.Among 7 patients with posterior uveitis,3 were choroiditis(1 tuberculosis,1 toxoplasmosis),one was chorioretinitis(toxoplasmosis),2 were retinitis (CMV retinitis)and one case vasculitis(tuberculosis).

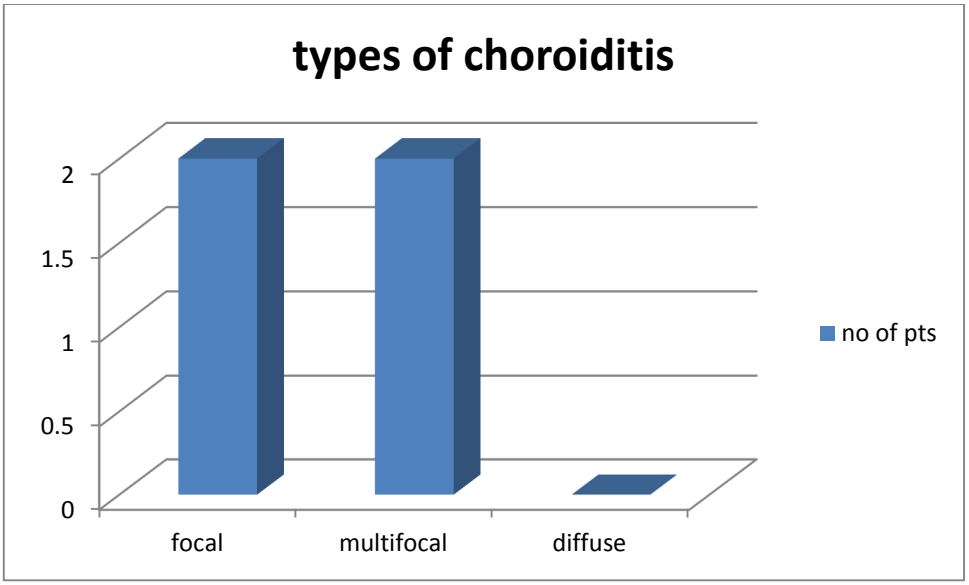


FIGURE 8 REPRESENTS DIFFERENT TYPES OF CHOROIDITIS.

Figure 8 represents different types of choroiditis.Among three patients with choroiditis one was focal and two were multifocal.

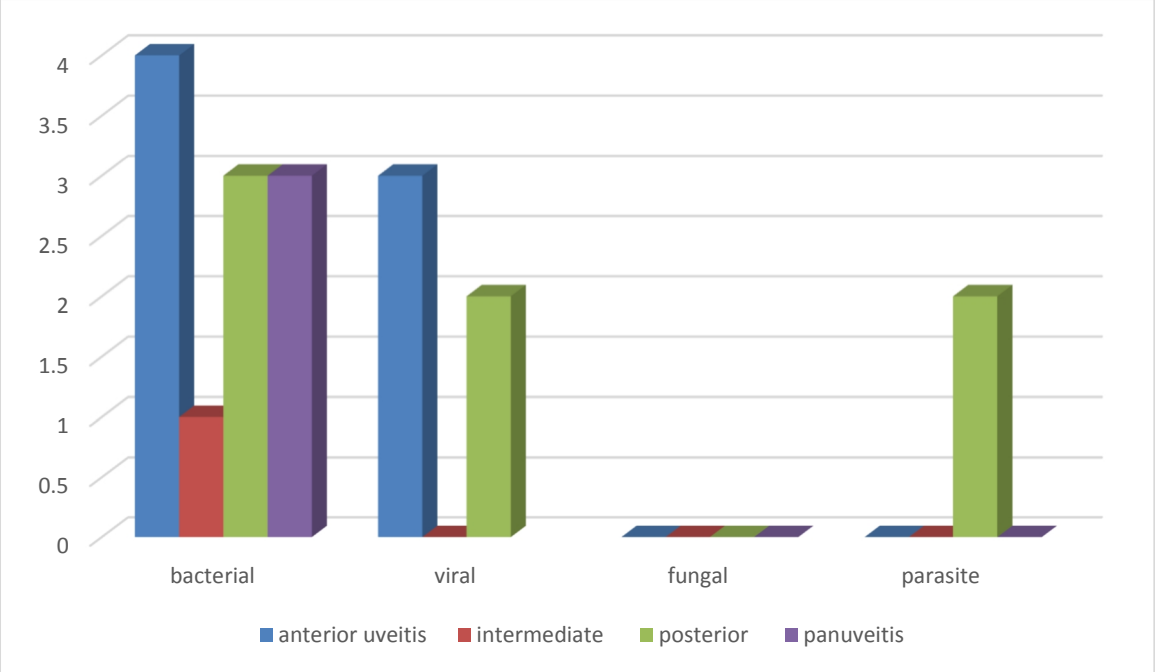


FIGURE 9:DISTRIBUTION OF INFECTIVE ETIOLOGY

Figure 9 represents distribution of infective etiology in different types of uveitis. Bacteria was infective etiology in 4 patients with anterior uveitis(2 tubercuosis, 1 leprosy,1 syphilis)1 patient with intermediate uveitis(tuberculosis,3 cases of posterior uveitis and 3 cases of panuveitis.Virus was infective etiology in 3 patients with anterior uveitis (2 herpes zoster and I HIV) and 2 cases of posterior uveitis(2 CMV).Fungus was not infective etiology in any of the cases.Parasite was infective etiology in 2cases of posterior uveitis(2 toxoplasmosis).

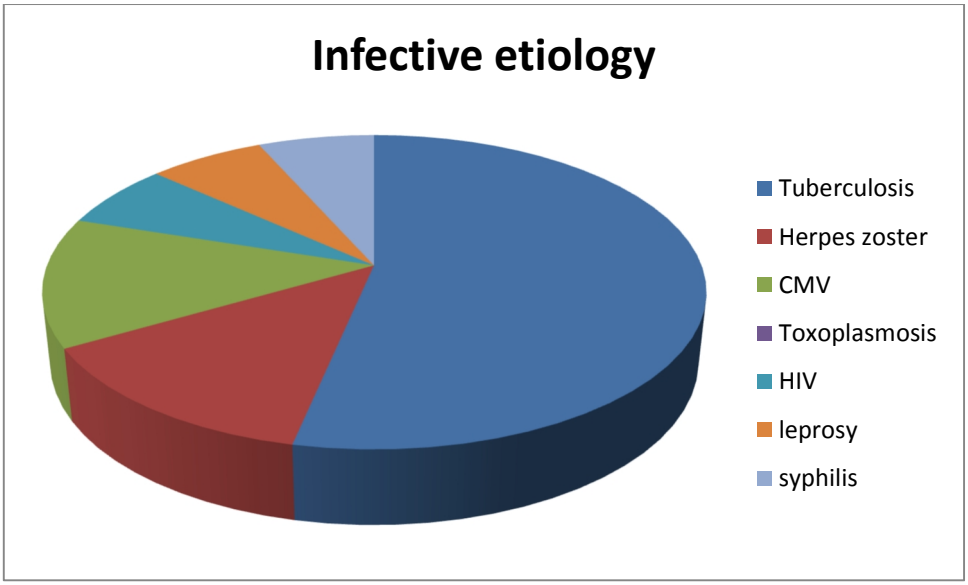


Figure 10:distribution of uveitis caused by various infective agents

Figure 10 represents distribution of uveitis caused by various infective agents.8 patients had tuberculosis as the infective etiology(2 anterior uveitis,1 intermediate uveitis,3 posterior uveitis,3 panuveitis).2 had herpes zoster induced anterior uveitis,2 had CMV retinitis,2 had toxoplasmosis(posterior uveitis) ,1 had anterior uveitis due to leprosy,1 patient had syphilitic anterior uveitis and 1 patient had anterior uveitis due to HIV.

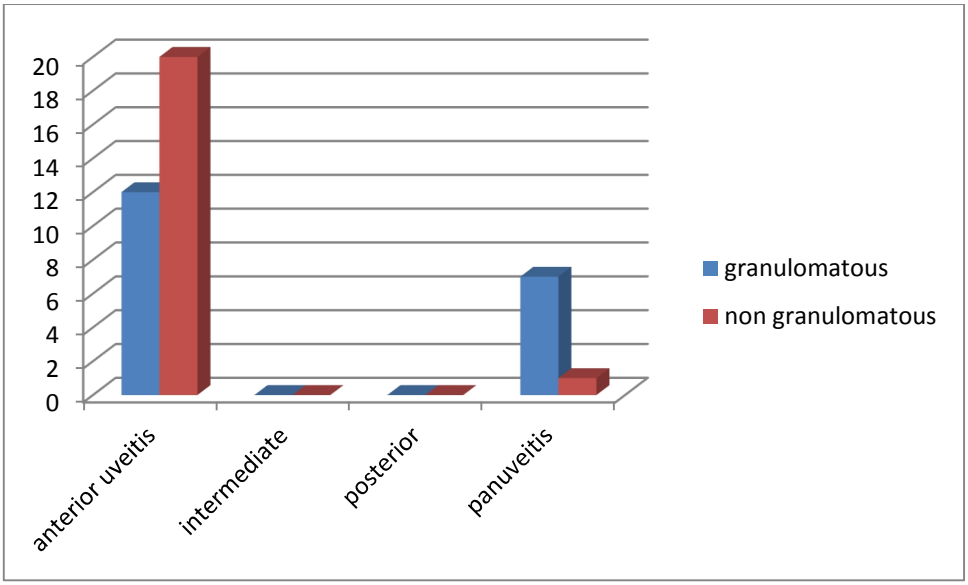


FIGURE 11:PATHOLOGICAL CLASSIFICATION OF UVEITIS .

Figure 10 represents pathological classification of uveitis .Among 32 patients with anterior uveitis 10 were granulomatous,20 non-granulomatous type.10 cases could not be classified as either type(3 intermediate uveitis and 7 posterior uveitis).Among 8 patients with panuveitis ,7 were granulomatous and 1 was non- granulomatous.

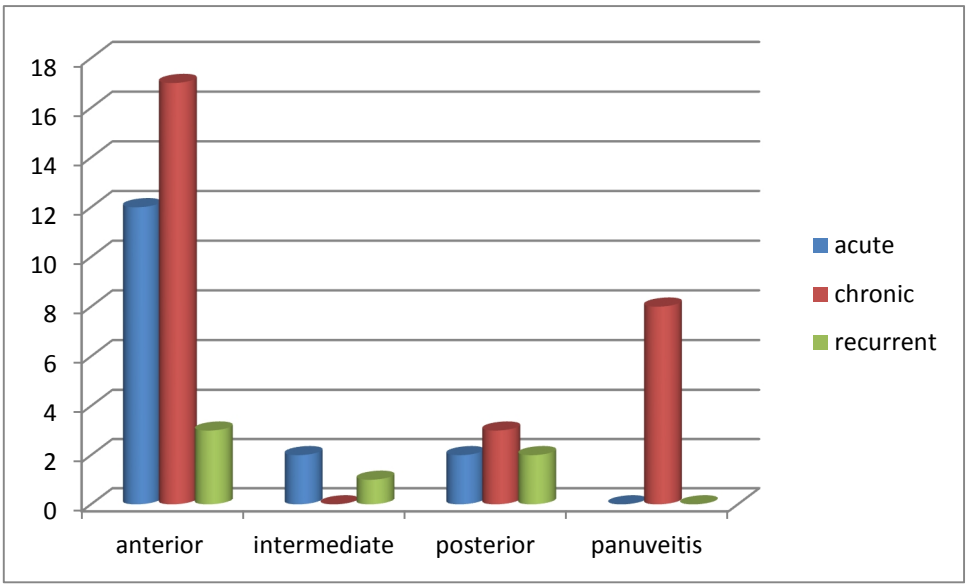


FIGURE 12 : CLINICAL CLASSIFICATION OF UVEITIS.

Figure 11 represents clinical classification of uveitis.Among 32 patients with anterior uveitis,12 were acute,17 were chronic and 3 recurrent.Among 3 patients with intermediate uveitis,2 were acute and 1 recurrent.Among 7 patients with posterior uveitis 2 were acute,3 chronic and 2 recurrent.All 8 patients with panuveitis were chronic.

12] DISCUSSION

In my study adults(70%) were most commonly affected due to uveitis . The age of patients ranged from 30-60 years.The mean age at presentation was 39.7± 14.06 yrs. .Children(1%) and elderly(14%) were less commonly affected similar to the study by BenEzra et al[30] and Favre et al[44].In our study,there was no sexual preponderance similar to the study by Smith R et al [37] and Rothova et al[39] while male predominance was seen in a study by Biswas et al[11]

Unilateral uveitis (70%) was more common than bilateral(30%) . Unilateral uveitis was commonly seen in idiopathic (n=11), spondyloarthropathies (n=9),Fuchs(n=2),herpetic anterior uveitis(n=2).The other causes of unilateral uveitis were due to leprosy(n=1), syphilitic anterior uveitis(n=1), Bechet(n=1), toxoplasmosis(n=1), TB choroiditis (n=1), HIV associated anterior uveitis(n=1) and tuberculous intermediste uveitis(n=1).Bilateral uveitis is more common in due to entities like tuberculosis(n=4), idiopathic (n=3),VKH syndrome(n=3),pars planitis (n=2)sarcoidosis (n=1) CMV retinitis (n=2).Thus 65 eyes of 50 uveitic patients were affected.

Anterior uveitis was the most common anatomical type of uveitis(64% n=32) followed by panuveitis(16% n=8),posterior(14%n=7) and intermediate uveitis(6% n=3). This is similar to the study by Zheng et al [43]from China ,intermediate uveitis was the least common accounted to 1% of the study

population.In a study by Biswas et al[10] anterior uveitis was the most common type followed by intermediate ,posterior and panuveitis. R Singh et al[12],Dogra et al[13],Das et al[14], Venkatesh et al[17], Hendererly et al [24] reported that anterior uveitis was the most common type followed by posterior ,intermediate and panuveitis.

Plasule et al [16] reported that anterior uveitis was the most common type followed by panuveitis, posterior uveitis and intermediate uveitis similar to my study.

Chronic uveitis(56%) was more common than acute uveitis(28%) . The rest were recurrent forms of uveitis(16%). Acute forms of uveitis predominate in community based hospitals[36],while chronic forms in tertiary referral practices[33].Chronic uveitis is more common in our study because ours is a tertiary referral centre.

42% of the uveitis was non granulomatous and 38% of the uveitis was granulomatous .This is similar to the study by Khairallah et al[33],Biswas et al[11].In 20% of the uveitis the type of inflammation was not identified.The causes and increased frequency of nongranulomatous uveitis is due to spondyloarthropathies (n=9),Fuchs(n=2),herpetic anterior uveitis(n=2), .The common causes of granulomatous uveitis is due to tuberculosis(n=6),idiopathic (n=3),VKH disease(n=3),sarcoidosis(n=1) .

32% (n=16)of the uveitis was due to non infectious etiology and 36%(n=18) of the uveitis was due to infective etiology. 32%(n=16) of the uveitis was idiopathic. Infective uveitis was more common than non infective uveitis.Infectious uveitis accounted for a minority of cases in developed countries [33,34,36,37,38,39].Infectious uveitis occurs in greater frequency in developing world[9,20] The most common cause of infectious uveitis was due to tuberculosis (16%) followed by toxoplasmosis, herpes zoster,cytomegalovirus(4% each).This is opposed to the study by Das et al[14] who reported toxoplasmosis as the major cause(40.2%) .Rathinam et al[20] found leptospirosis as the leading cause of anterior uveitis (9.7%) which was not seen in our study.

Among anterior uveitis,7 patients with uveitis were infectious(21%) .These include tuberculosis(n=2),herpetic anterior uveitis(n=2),HIV(n=1) and other rare causes include leprosy(n=1) and syphilis(n=1).Only one patient with intermediate uveitis had tuberculosis as the infective etiology. All cases of posterior uveitis were infectious,tuberculosis(n=3),toxoplasmosis(n=2),CMV retinitis in HIV patients(n=2).

Uveitis associated with spondyloarthropathy(18%) was the most common cause among non infectious etiology.These include HLAB27 related anterior uveitis(n=6),rheumatoid arthritis(n=2),juvenile rheumatoid arthritis(n=1).The

other cause of non infectious etiology include Behcet disease(n=1) Fuchs heterochromic iridocyclitis(n=2),VKH(n=3),sacoidosis(n=1).

The term idiopathic was used for cases in which intraocular inflammation was not characteristic of a recognised uveitic entity or could not be attributed to a specific underlying systemic disease [10]. Out of 32 patients with anterior uveitis diagnosis could not be reached in 13 (40.6%) patients.Thus,idiopathic was the most common cause of anterior uveitis. This is similar to the study by Biswas et al [11] .Pars planitis (66% n=2)was the most common cause of intermediate uveitis.Mi H et al[28] reported pars planitis as the most common etiolog in intermediate uveitis.Similarly diagnosis could not be reached in one case of panuveitis.

The common cause of posterior uveitis were TB related posterior uveitis(n=3) .The manifestation of proven tubercular uveitis was in the form of focal choroiditis (n=1),multifocal choroiditis(n=1) and vasculitis(n=1). Rathinam et al [20]reported that infective uveitis is more common in posterior forms of uveitis similar to my study. Biswas et al[10] reported that TB related posterior uveitis was the most common cause similar to my study.

The common causes of panuveitis in my study were VKH(n=3) and tuberculosis(n=3)42% each.This is similar to the studies by Biswas et al [10,11] which reported VKH as the most common cause of panuveitis .Tuberculosis is an important cause in panuveitis [9,10]in contrast to sarcoidosis which was reported as a important cause of panuveitis in previous study by Biswas et al [11].In my study only one patient with panuveitis had sarcoidosis as the infective etiology.No case of sympathetic ophthalmia in our study.

In our study, six(12%) patients were retroviral disease positive.One patient showed anterior uveitis,four patients had posterior uveitis and one patient had panuveitis.Among these six patients specific diagnosis could be reached in all six patients, one patient had anterior uveitis,one patient had TB choroiditis,two patients had CMV retinitis,one had multifocal choroiditis due to toxoplasmosis and one had tuberculous panuveitis.

As mentioned by BenEzra et al.[15] “pattern changes in uveitis diagnosis” in different uveitis is due to the cause for the variable incidence of specific uveitic etiologies reported in different studies. These pattern changes are because of a multitude of factors, including genetic, ethnic, geographic, and environmental factors in addition to “changing pattern of uveitis” over the years.

Overall the results from study were comparable to other studies mentioned above. However there is the limitation of making valid comparisons between uveitis statistics of different countries, due to different diagnostic criterion and concept of etiopathogenesis.. My institute being a tertiary referral center, more patients with posterior uveitis and panuveitis could have been referred, and hence the total incidence quoted may not truly reflect the actual incidence in the population. Despite these limitations, the results still have the strength of being able to study the patterns of uveitis as they are consistent and reliable with no interpersonal variation.

13]CONCLUSION

1. Anterior uveitis is the most common anatomical type of uveitis.
2. Idiopathic uveitis is the most common type of anterior uveitis.
3. Pars planitis is the most common cause of intermediate uveitis.
4. TB related posterior uveitis is the most common cause of posterior uveitis.
5. Vogt Koyanagi Harada disease and TB related panuveitis are the most common causes of pan uveitis.
6. Infective uveitis is more common than non infective uveitis.
7. Infective uveitis is more common in posterior and panuveitis.
8. Tuberculosis is the most common form of infectious uveitis.
9. Spondyloarthropathy is the most common cause of non-infective cause of uveitis.

FIG1. BROKEN SYNECHIAE

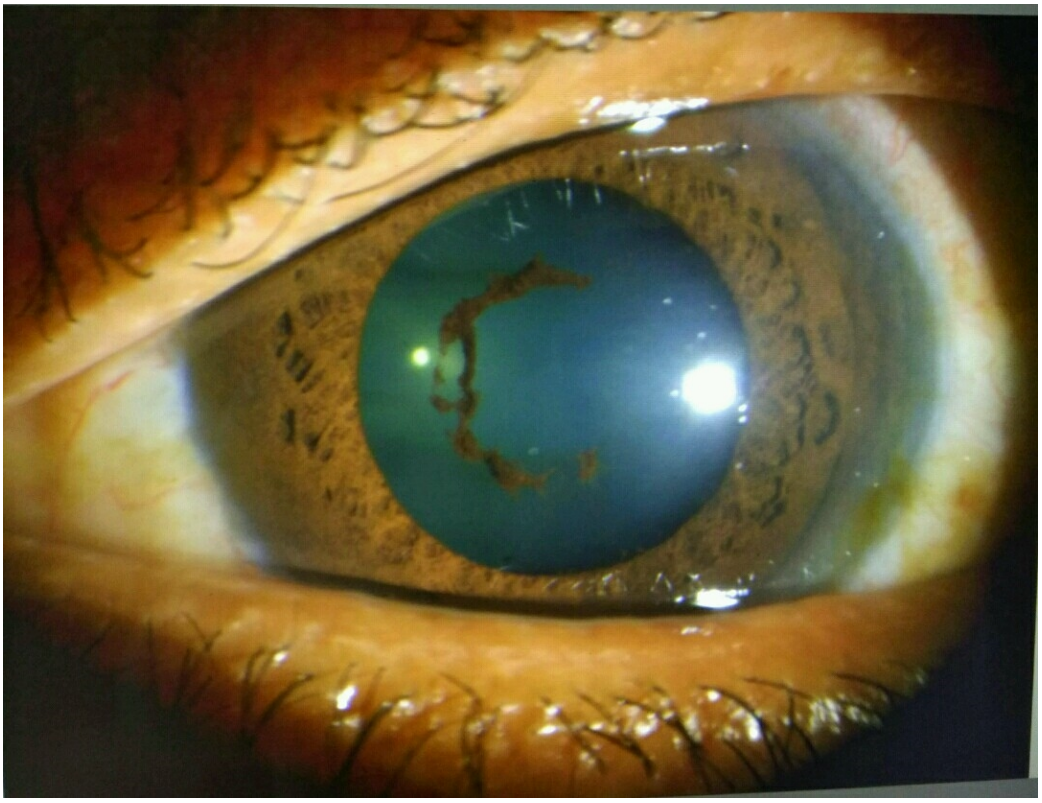


FIG 2. KERATIC PRECIPITATES IN A CHILD WITH RVD POSITIVE

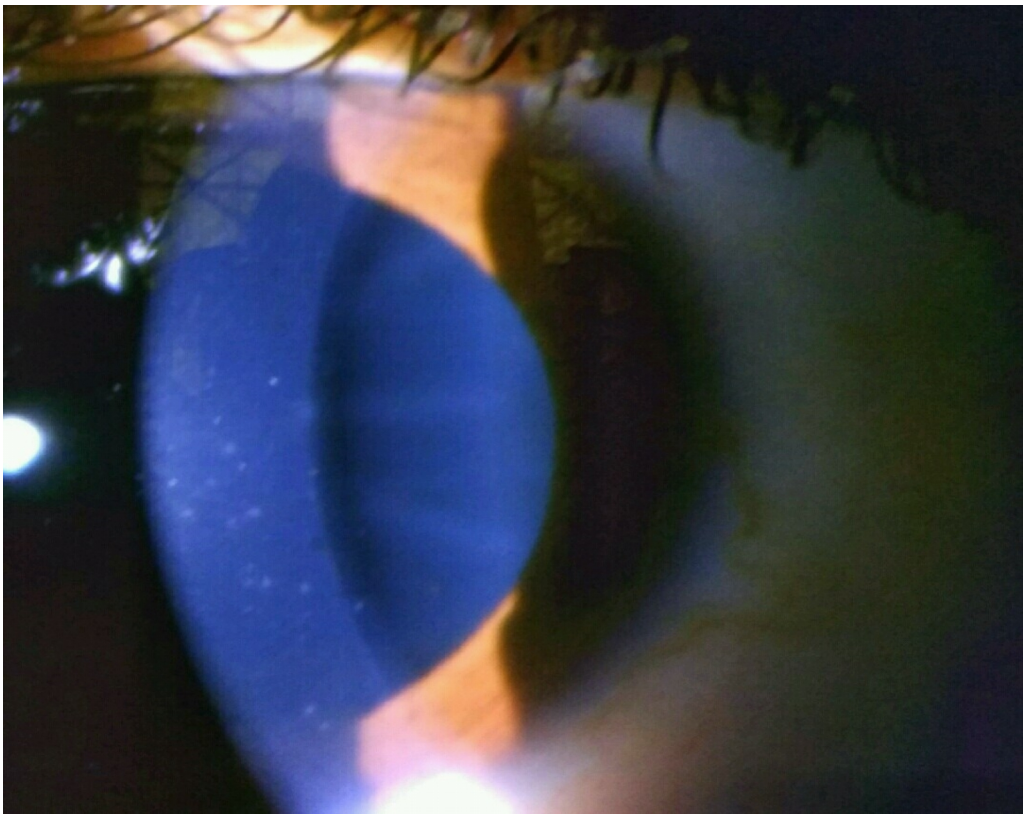


FIG 3. POSTERIOR SYNECHIAE IN A PATIENT WITH JRA

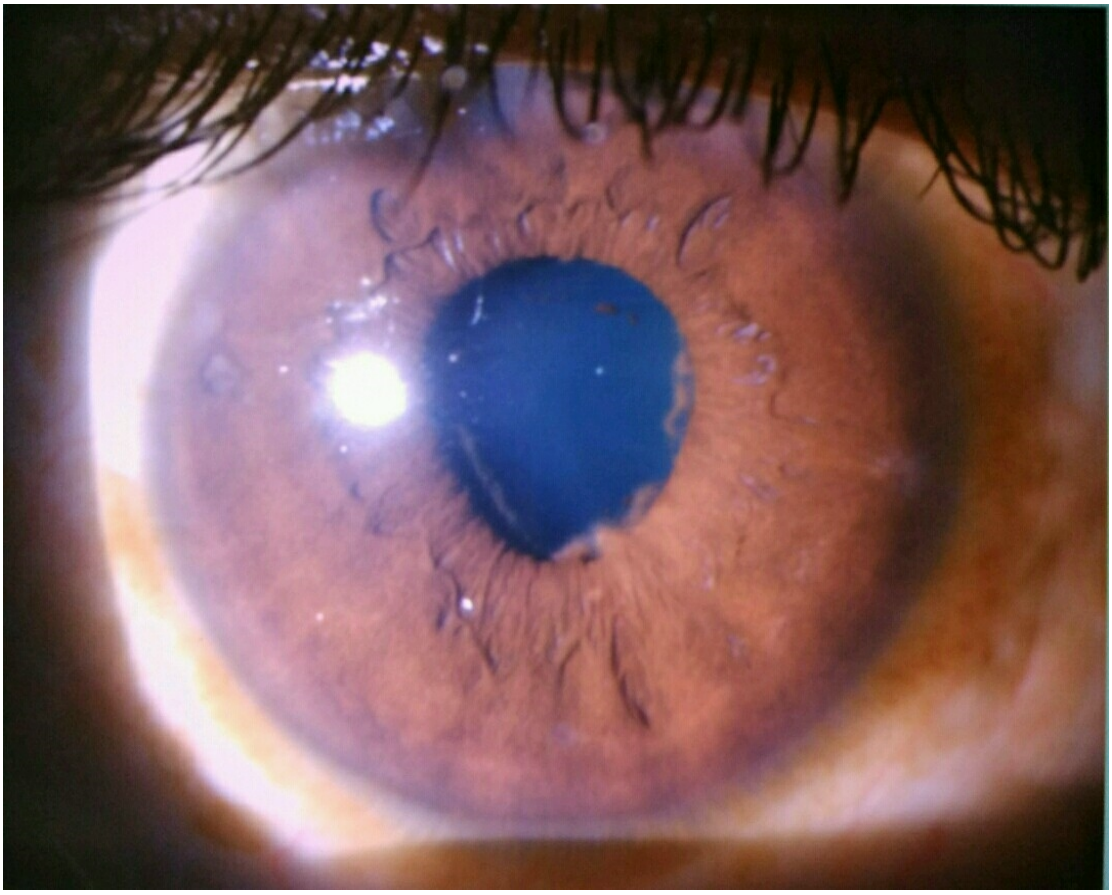


FIG 4. POSTERIOR SYNECHIAE IN UNILATERAL IDIOPATHIC ANTERIOR UVEITIS

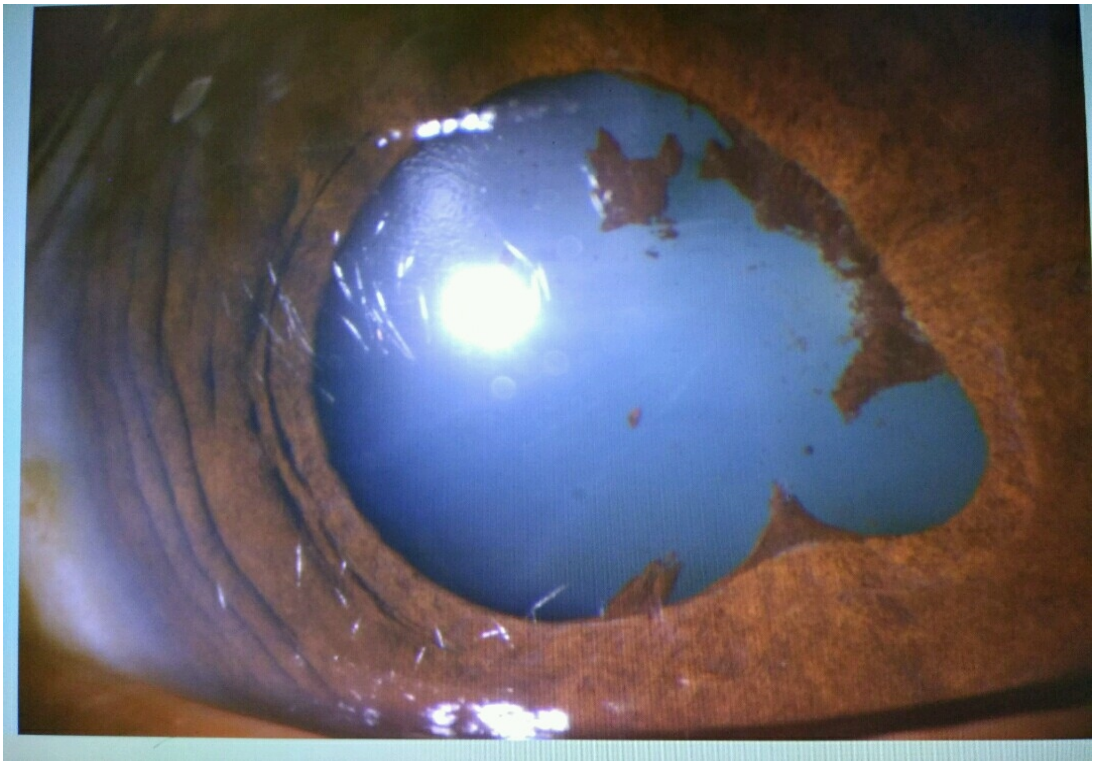
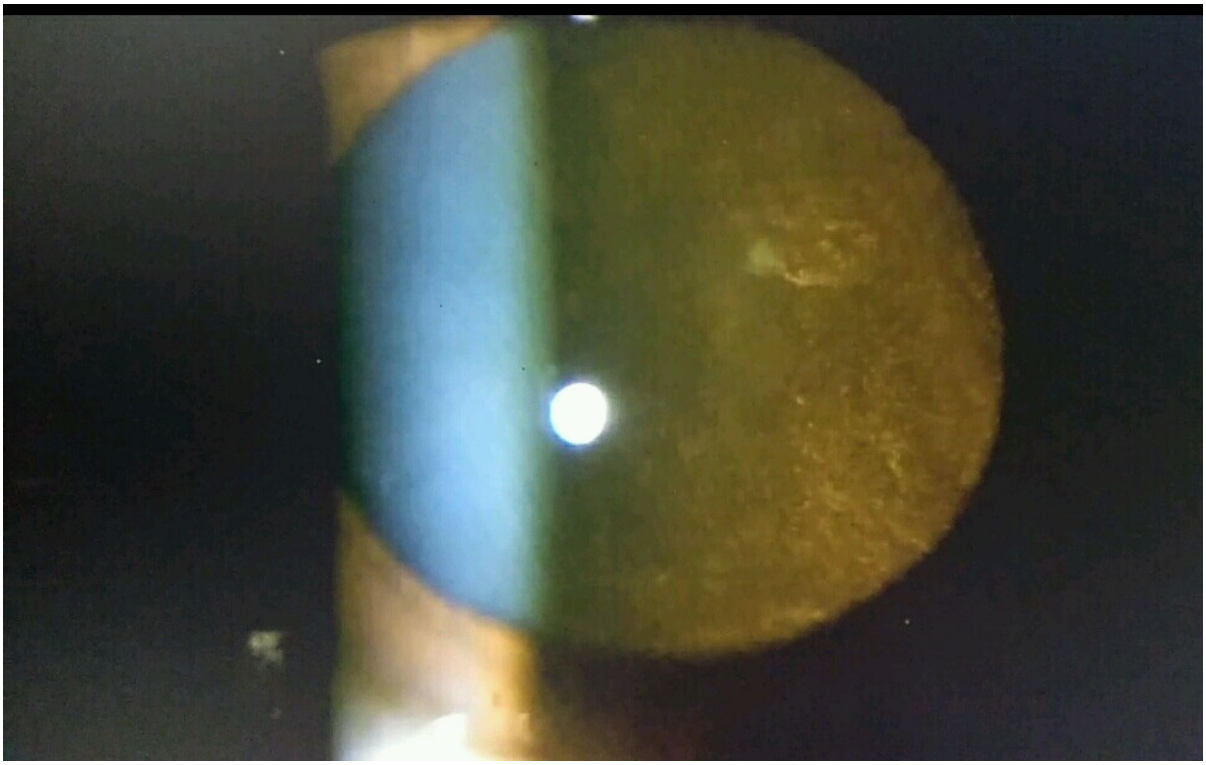


FIG 5. VITREOUS CELLS IN INTERMEDIATE UVEITIS



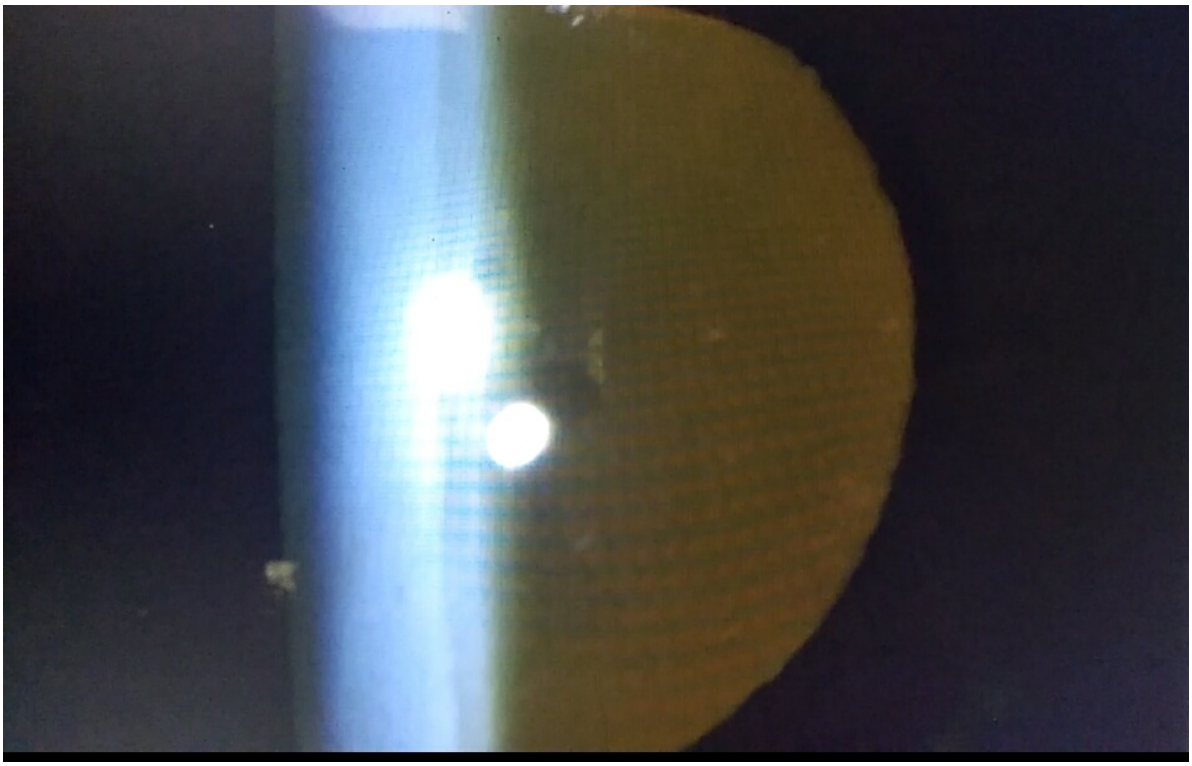
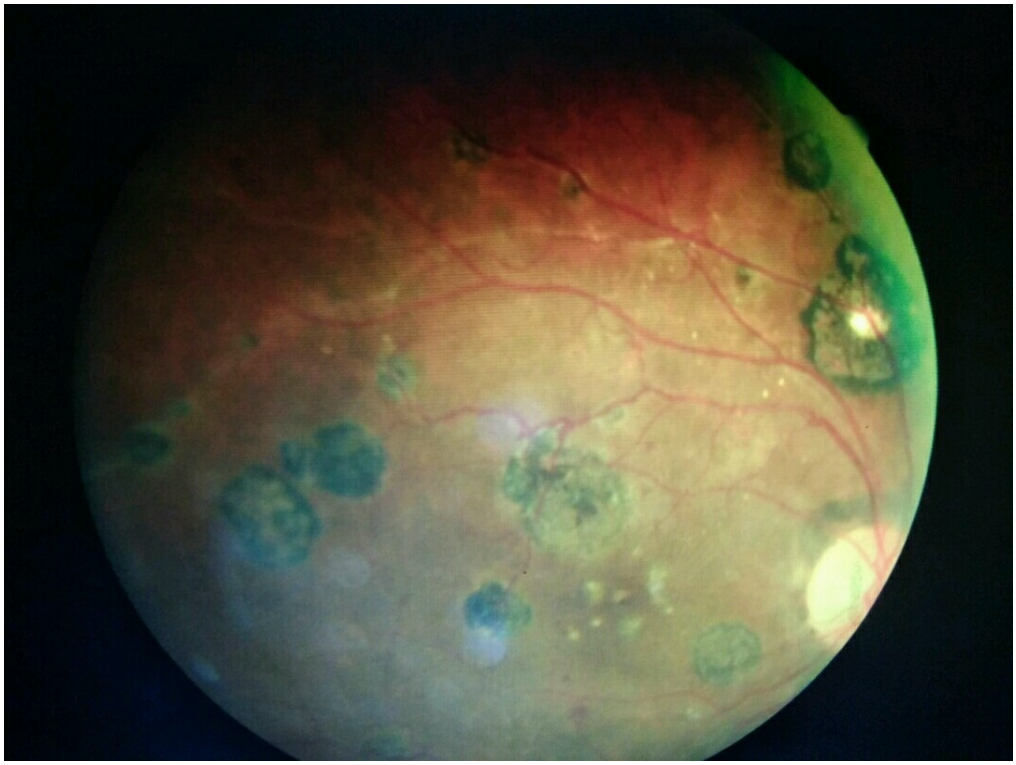


FIG 6. MULTIFOCAL CHOROIDITIS



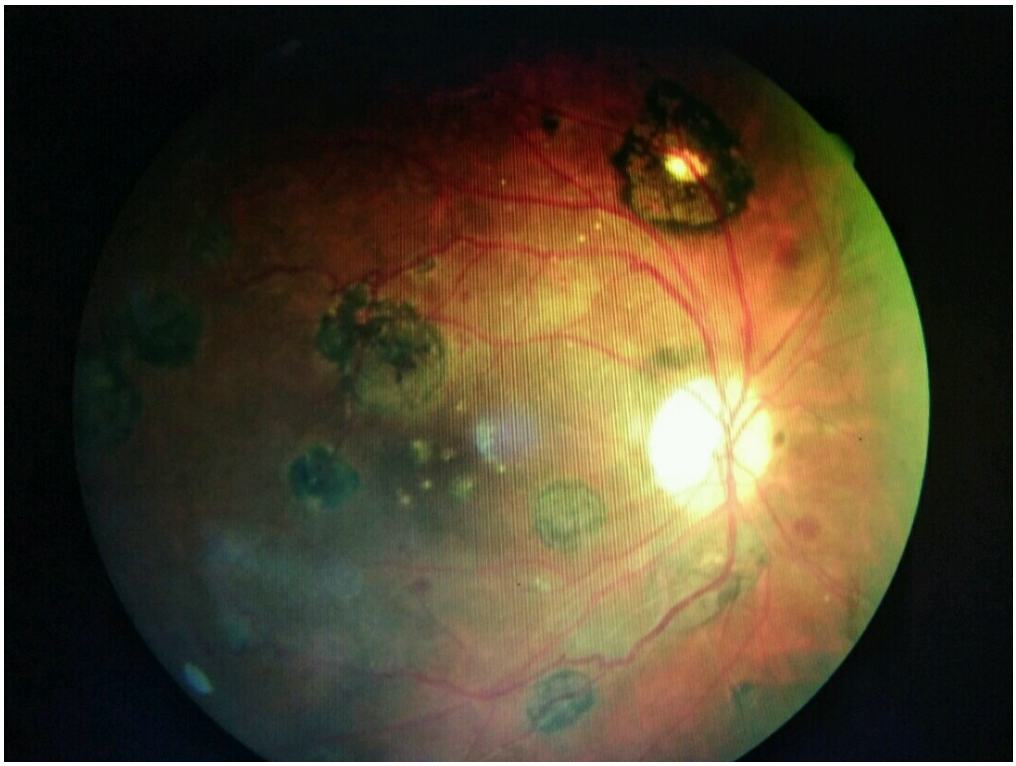


FIG 7. CMV RETINITIS

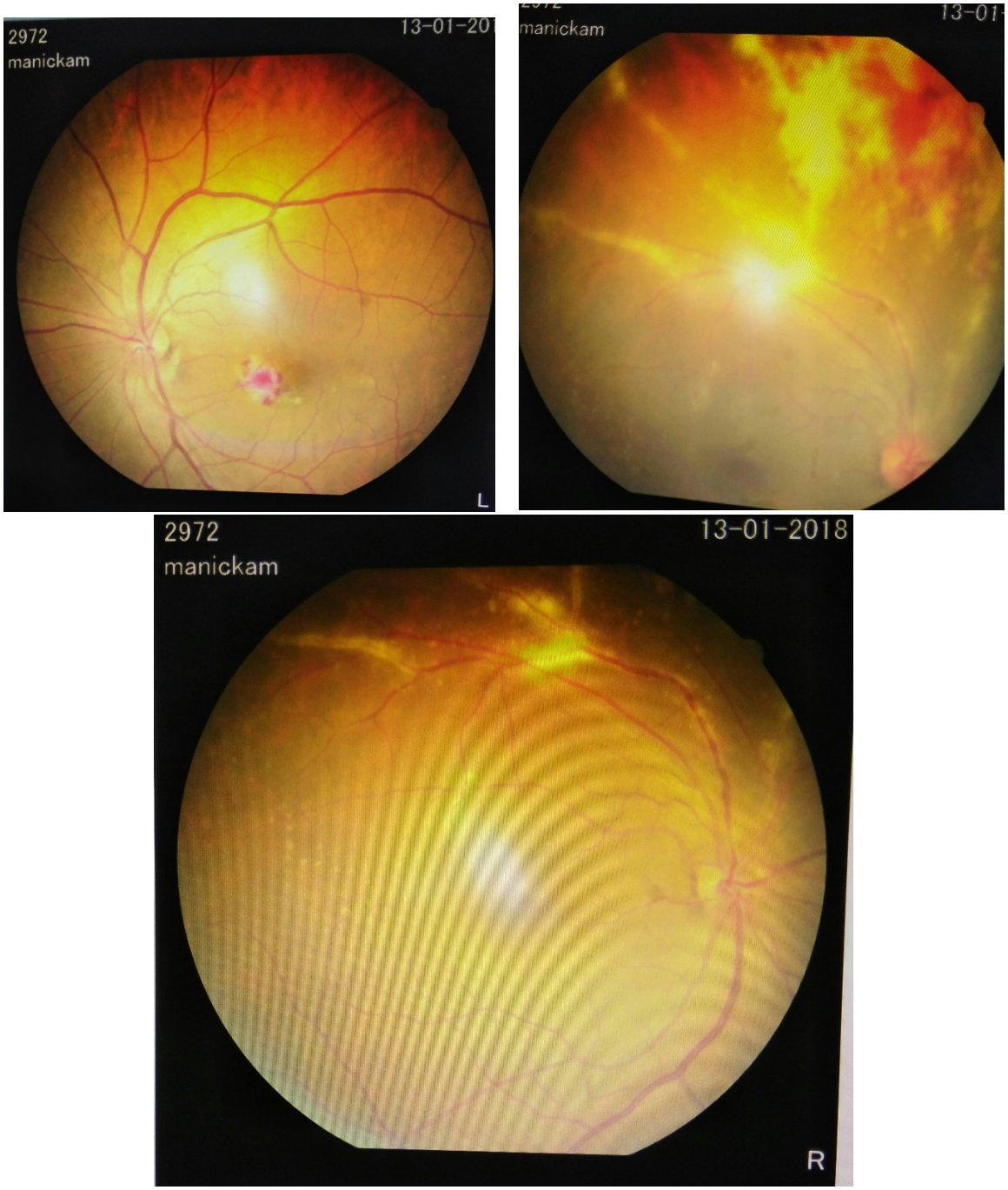


FIG 8. TB VASCULITIS

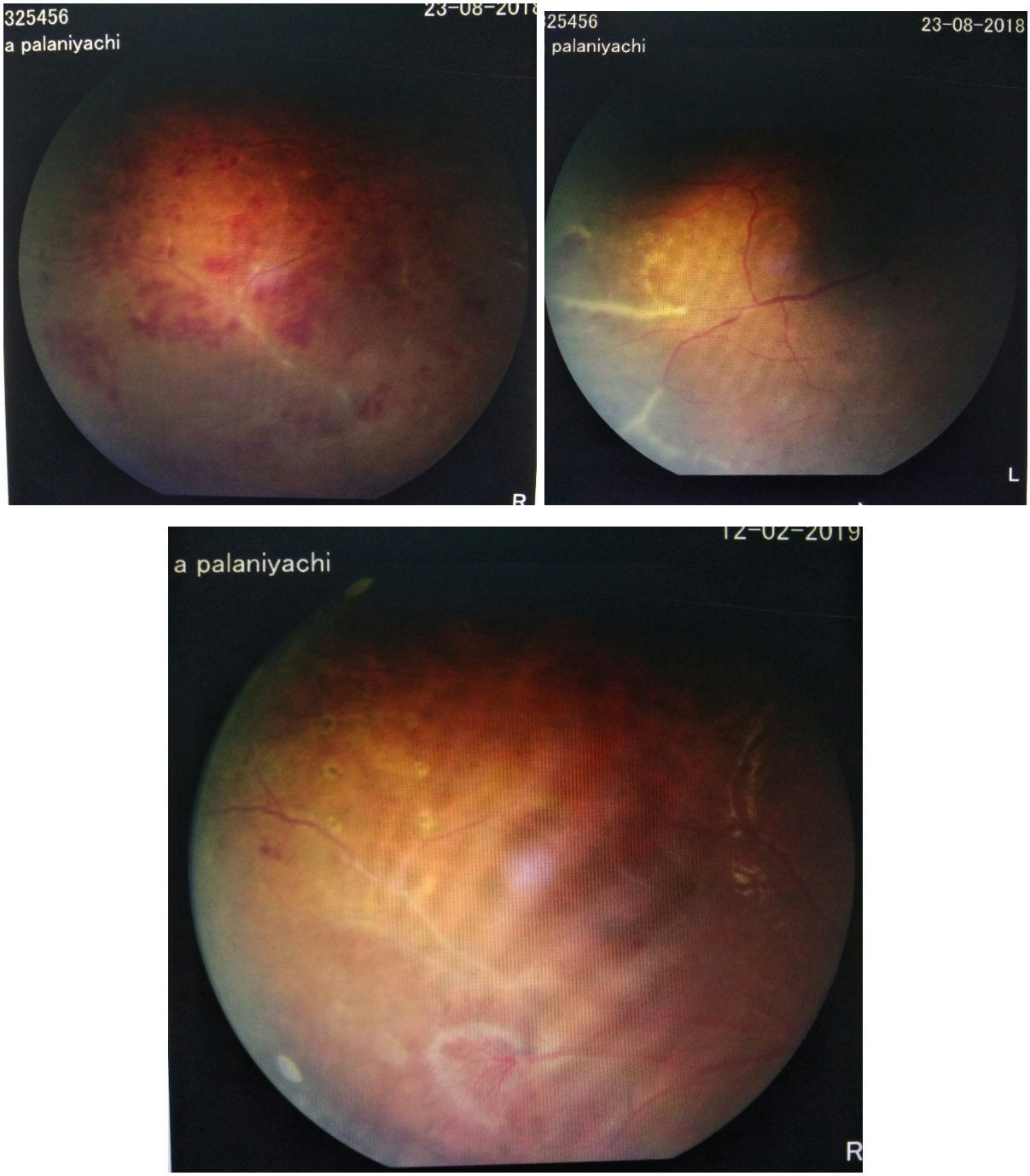


FIG 9. FUNDUS IMAGE OF TB PAN UVEITIS PATIENTS

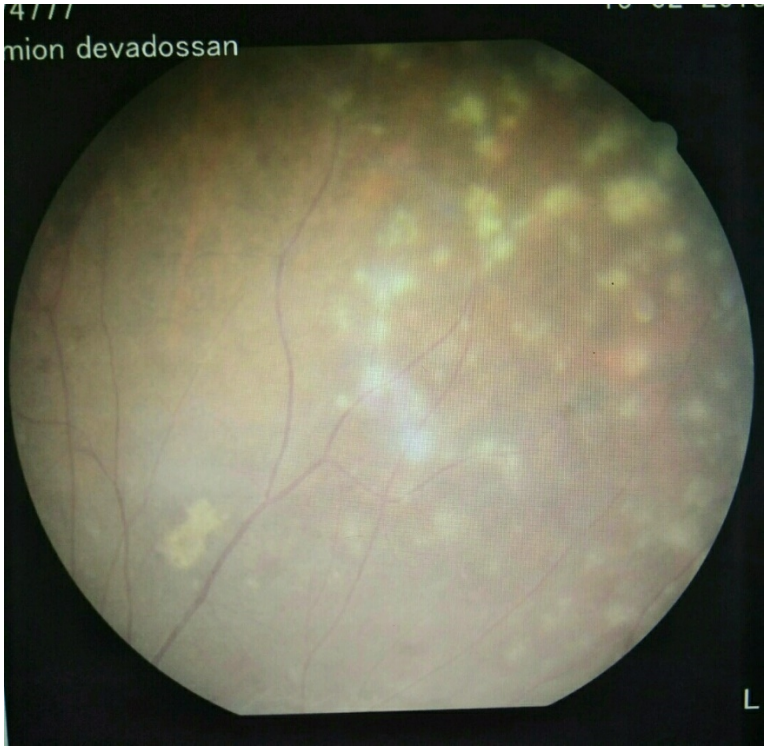
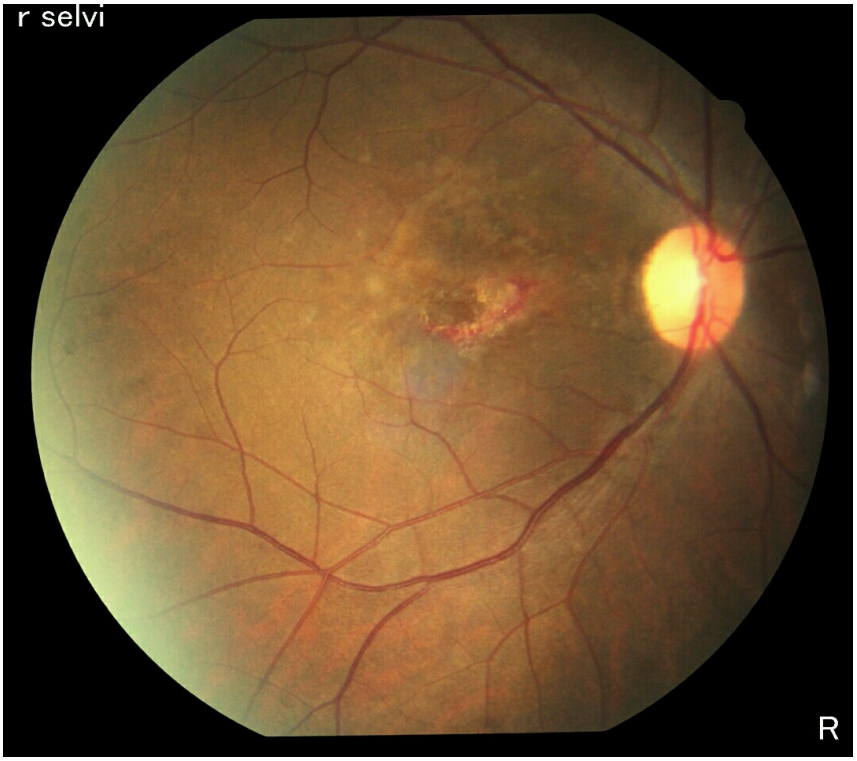


FIG 10.TB CHOROIDITIS IN A RVD POSITIVE PATIENT



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ETIOLOGICAL PROFILE AND CLINICAL PATTERN OF UVEITIS

Patient Name: Serial No: _____

Sex: 1. Male 2. Female ☐ ☐

Age: 1. Child (16 years)

2. Young Adult (17-30 yrs)

3. Adult (31-60 yrs)

4. Elderly (>60 yrs)

Occupation:

Residence:

Any injury to the eye?	1.Yes	2.No
Any history of anemia / Diabetes/SHTN/TB/leprosy/STDs/chickenpox/herpes/arthritis?	1.YEs	2.No
Have you ever had unpasteurised milk?	1.Yes	2.No
Have you ever been exposed to sick animals?	1.Yes	2.No
Do you drink untreated water?	1.Yes	2.No
Have you ever noticed rodents in and around the residence	1.Yes	2.No
Do you smoke cigarettes?	1.Yes	2.No
Have you ever used iv drugs?	1.Yes	2.No
Do you have any allergies to medication?	1.Yes	2.No
If yes, what medication?	1.Yes	2.No
Any medication that you are currently taking?	1.Yes	2.No
Any eye surgeries you had?	1.Yes	2.No

Have you owned a dog or cat?	1.Yes	2.No
Have you ever eaten raw meat?	1.Yes	2.No
Have you ever had any of the following symptoms?	1.Yes	2.No
General examination		
Chills	1.Yes	2.No
Fever (Persistent / recurrent)	1.Yes	2.No
Lymphadenopathy	1.Yes	2.No
Night sweats	1.Yes	2.No
Fatigue	1.Yes	2.No
Poor appetite	1.Yes	2.No
Unexplained weight loss	1.Yes	2.No
Head		
Herd ache	1.Yes	2.No
Numbness / Tingling in your body	1.Yes	2.No
Paralysis in parts of your body	1.Yes	2.No
Seizures / convulsions	1.Yes	2.No
Any ear / nose or throat infecitions		
SKIN	1.Yes	2.No
Rashes	1.Yes	2.No
Sunburn easily (photosensitivity)	1.Yes	2.No
White patches of skin or hair	1.Yes	2.No
Loss of hair	1.Yes	2.No
Severe itching	1.Yes	2.No
Painfully cold fingers	1.Yes	2.No

Respiratory		
Constant coughing	1.Yes	2.No
Coughing up blood	1.Yes	2.No
Wheezing	1.Yes	2.No
CVS		
Chest pain	1.Yes	2.No
Shortness of breath	1.Yes	2.No
BLOOD		
Frequent or easy bleeding	1.Yes	2.No
GI		
Trouble swallowing	1.Yes	2.No
Diarrhoea	1.Yes	2.No
Blood stools	1.Yes	2.No
Jaundice	1.Yes	2.No
BONES AND JOINTS		
Stiff joints	1.Yes	2.No
Stiff lower back	1.Yes	2.No
Muscle aches	1.Yes	2.No
GENITOURINRINARY		
Genital sores or ulcers	1.Yes	2.No
Blood in urine	1.Yes	2.No
Urinary discharge	1.Yes	2.No

Anatomical	1. Anterior		☐
	2. Intermediate		
	3. Posterior		
	4. Panuveitis		
Chronology	1. Acute	2. Chronic	☐
Laterality	1. Unilateral		☐
	2. Bilateral		
	3. Alternating		
Pathology	1. Granulomatous		☐
	2. Non-Granulomatous		
	3. Not-Determined		
Pattern	1. Focal		☐
	2. Diffuse		
	3. Disseminated		

	RE	LE
BCVA		
Ocular examination		
Conjunctiva		
Cornea		
If Kps present	☐	☐
1. Fresh		
2. Old		
3. Mutton fat		

AC

If cells present

(grading ☐ ☐

1. 1-5 -> 0.5 +
2. 0-15-> 1+
3. 16-25->2+
4. 26-50->3+
5. 50+->4+)

If flare present, ☐ ☐

(Grade 1. Faint -> 1+

2. Moderate-> 2+

(iris / lens details can be made out)

3. Marked (iris / lens hazy) 3+

4. intense (fibrin / plastic aqueous) 4+

IRIS

PUPIL

LENS

FUNDUS

AT

GONIO

FFA

COMPLICATIONS

1. Glaucoma
    - Uveitic Yes No
    - 2^0 ACG Yes No
    - Chronic Yes No
    - Corico Steroid induced Yes No
    - 2^0 OAG Yes No
2. Hypotony Yes No
3. Cystoid macular edema Yes No
4. Vitreours opacities Yes No
5. Retinaldetachment Yes No
6. Retinal and choroidal neovascularisation Yes No
7. Complicaed cataract Yes No
8. Band shaped keratopathy Yes No
9. Vitreous haemorrhage Yes No

INVESTIGATIONS

CBC

EST

CRP

RBS

ICTC

MANTOUX

VDRL

SERUM CALCIUM

CXR

CT CHEST

TESTS IN NEEDED

RF

ANA

HLA TYPING

CT / MRI BRAIN

AQUEOUS / VITREOUS TAP PCR

ELISA (TOXO, HSV, CMV)

TREATMENT GIVEN

Regular follow up & BCVA during each followup

ABBREVIATIONS USED IN EXCEL SHEET

SEX

1.Male

2.Female

AGE

1.Child(16 years)

2.Young adult(17-30 years)

3.Adult(31-60 years)

4.Elderly(>60 years)

CHRONOLOGY

1.Acute

2.Chronic

3.Recurrent

LATERALITY

1.Unilateral

2.Bilateral

PATHOLOGY

1.Granulomatous

2.Non-granulomatous

3.Not defined

ETIOLOGY

1.Idiopathic

2.Immune related

3.Infective

4.Special type

NAME	AGE	SEX	CHRONOLOG	LATERALITY	PATHOLOGY	ANATOMICAL	ETIOLOGICAL	DIAGNOSIS	HIV +/-
marimuthu	2	1	1	1	2	1	2	HLAB27	2
Esakkiraj	1	1	2	1	3	3	3	toxo	1
Simion	1	1	2	2	1	4	3	TB	1
Ponnusamy	3	1	2	2	1	1	1	Idiopathic	2
Manickkam	3	1	3	1	3	3	3	CMV	1
pechimuthu	3	1	3	2	2	1	2	RA	2
singaravelavan	3	1	3	2	2	1	2	HLAB27	2
selvi	3	2	1	1	1	3	3	TB	1
dhanalakshmi	3	2	2	2	2	1	1	Idiopathic	2
balamurugan	2	1	2	2	2	1	2	JRA	2
selvi	3	2	1	1	1	1	1	Idiopathic	2
swetha	1	2	3	2	2	1	3	HIV	1
shanmugavel	2	1	1	2	2	1	2	Behcet	2
parameswari	1	2	2	1	1	4	1	Idiopathic	2
uma	3	2	1	2	3	2	1	Idiopathic	2
esakkiammal	3	2	2	1	1	1	1	Idiopathic	2
madar	4	1	2	1	1	1	1	Idiopathic	2
esakkimuthu	3	1	2	1	3	3	3	TB	2
palaniyammal	2	2	3	1	3	3	3	TB	2
vembu	4	2	2	1	2	1	1	Idiopathic	2
ramalakshmi	4	2	3	1	1	4	3	TB	2
petchimuthu	3	1	2	1	2	1	3	leprosy	2
muppidathy	3	2	2	2	1	4	2	VKH	2
rajagopal	3	1	1	1	3	3	3	TOXO	2
balamurugan	3	1	2	1	1	4	2	VKH	2
ponthangam	3	2	2	1	2	1	1	Idiopathic	2
iyyanar	4	1	2	2	1	1	3	TB	2
mydeen fathima	4	2	2	1	2	1	1	Idiopathic	2
pechipandi	3	1	1	1	1	1	1	Idiopathic	2
chinnathambi	4	2	2	1	1	1	1	Idiopathic	2
chanrasekar	3	1	1	1	2	1	2	HLAB27	2
velammal	3	2	1	1	2	1	3	herpes zoster	2

NAME	AGE	SEX	CHRONOLOG	LATERALITY	PATHOLOGY	ANATOMICAL	ETIOLOGICAL	DIAGNOSIS	HIV +/-
shanthi	3	2	2	2	1	4	2	VKH	2
ponnusamy	3	1	2	2	2	1	1	Idiopathic	2
john	3	1	2	1	3	3	3	CMV	1
syed rabiya	3	2	1	2	1	1	2	RA	2
parvathy	3	2	2	1	2	1	1	Idiopathic	2
kalirajan	3	1	1	1	1	1	1	TB	2
selvi	3	2	2	1	2	1	4	fuchs	2
krishnammal	4	2	1	1	2	1	1	Idiopathic	2
murugan	3	1	2	2	2	1	2	HLAB27	2
fathima	3	2	1	1	2	1	4	fuchs	2
pitchumani	3	1	2	1	2	1	2	HLAB27	2
muthuselvam	3	2	1	1	2	1	3	herpes zoster	2
kowsalya	3	2	2	1	3	2	1	Idiopathic	2
murugan	3	1	1	1	2	1	2	HLAB27	2
subbulakshmi	3	2	2	1	1	4	2	SARCOID	2
chinnaraj	3	1	2	1	1	4	3	TB pan	2
esakkiappan	3	1	2	1	2	1	3	syphilis	2
sulochana	3	2	1	1	3	2	3	TB	2

நோயாளிகளுக்கு அறிவிப்பு மற்றும் ஒப்புதல் படிவம்
(மருத்துவ ஆய்வில் பங்கேற்பதற்கு)

ஆய்வு செய்யப்படும் தலைப்பு:
பங்கு பெறுவரின் பெயர்:
பங்கு பெறுவரின் வயது:

		பங்கு பெறுவர் இதனை ✓ குறிக்கவும்
1.	நான் மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்களை படித்து புரிந்து கொண்டேன். என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டுள்ளது என அறிந்து கொண்டேன்.	☐
2.	நான் இவ்வாய்வில் தன்னிச்சையாக தான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும், எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.	☐
3.	இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்து மேலும் ஆய்வு மேற்காள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன்.	☐
4.	இந்த ஆய்வின் மூலம் கிடைக்கும் தகவலையோ, முடிவையோ பயன்படுத்திக் கொள்ள மறுக்க மாட்டேன்.	☐
5.	இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக் கொள்கிறேன் எனக்கு கொடுக்கப்பட்டஅறிவுரைகளின் படி நடந்து கொள்வதுடன், ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிக்கிறேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ, அல்லது எதிர்பாராத, வழக்கத்திற்கு மாறான நோய்குறி தென்பட்டாலோ உடனே இதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்றேன்.	☐

பங்கேற்பவரின் கையொப்பம் / ..... இடம் .....
கட்டைவிரல் ரேகை
பங்கேற்பவரின் பெயர் மற்றும் விலாசம் .....
ஆய்வாளரின் கையொப்பம் /..... இடம் .....
ஆய்வாளரின் பெயர் .....
மையம் .....
கல்வியறிவு இல்லாதவற்கு (கைரேகை வைத்தவர்களுக்கு) இது அவசியம் தேவை
சாட்சியின் கையொப்பம் /..... இடம் .....
பெயர் மற்றும் விலாசம் ....