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# A Case Series of Ocular Manifestations in Tuberculosis

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**Abstract:-**
**Objective : To evaluate and understand the clinical manifestation and prevalence of ocular morbidity in Pulmonary tuberculosis patients. Lungs are primarily affected by Tuberculosis. Secondary involvement may occur in any organ including eye. Any part of the eye could potentially be affected by TB and its clinical manifestations can vary.**
**Materials & Methods : A hospital based observational study was conducted in government general hospital, Ananthapuramu for a period of 6 months from December 2022 to May 2023.Patients who were diagnosed as systemic tuberculosis on ATT were evaluated for ophthalmic involvement. These patients were examined by testing visual acuity, slit lamp examination to rule out anterior segment involvement, fundus examination to rule out choroiditis & optic neuritis and colour vision to rule out drug toxicity.**
**Results: Out of 20 patients who were diagnosed as active tuberculosis,10(50%) had granulomatous iridocyclitis, 4(20%) had Phlyctenular conjunctivitis, 4(20%) had nodular scleritis and 2(10%) had diffuse scleritis.**
**Conclusion: Granulomatous iridocyclitis is most common ocular manifestation encountered in our study and these patients responded with anti-tubercular treatment, steroid therapy and cycloplegic treatment with periodic follow up.**

***Keywords***:- *Tuberculosis, Presumed Ocular Tuberculosis, Uveitis, Scleritis.*

## I. INTRODUCTION

The development of granulomas is a hallmark of Tuberculosis, a persistent illness brought on by the Mycobacterium tuberculosis. Ocular symptoms might be primary or secondary. Primary ocular TB occurs when the illness is isolated and/or when the eye serves as the bacilli's first point of entry. secondary ocular tuberculosis, which spreads hematogenously from main locations such lymph nodes and the lungs.

Approximately 2 million people, or roughly onethird of the global population, have Tuberculosis, yet only 10% of t hem have clinical symptoms. Being an obligate aerobe, Mycobacterium Tuberculosis prefers to develop in environments with high oxygen tension, such as the choroid and ciliary body of the eye. Any area of the eye or its adnexal tissues, including the retina, choroid, optic nerve, uvea, sclera, and eyelids, can be impacted by tuberculosis. The involvement of Tuberculosis bacilli in the eyelid might lead to persistent blepharitis, lid abscesses, or lupus vulgaris. Although the rate of ocular involvement varies among research, there has been widespread reporting of the link between systemic Tuberculosis illness and ocular dissemination.

Adolescents are usually affected by a progressive condi tion referred to as tuberculous conjunctivitis, that may event ually lead to scarring of the affected tissue.

Mycobacterium tuberculosis (TB) also causes phlyctenular keratoconjunctivitis, a type IV hypersensitivity response towards tuberculous protein. An indication of the involvement of the sclera by the tuberculosis bacteria is focal necrotizing scleritis. A tuberculosis infection generally manifests as acute or chronic granulomatous anterior uveitis with mutton fat keratic precipitates, often with hypopyon or posterior synechiae.

In addition, it may result in pars planitis, an intermediate type of uveitis that presents with vascular sheathing, snowballs, snow banks, vitritis, and peripheral granulomas. A common complication of this condition is cystoid macular oedema. The most common posterior segment involvement seen with M. tuberculosis is choroiditis, which can be either widespread or localized. Tuberculosis-related involvement of the choroid could potentially manifest as tuberculoma, choroidal tubercles, or subretinal abscess. Retinal involvement frequently occurs from Tuberculosis bacilli causing choroidal involvement. Primary retinal involvement manifests as Eale's disease or vasculitis. Optic neuropathy can be caused on by inflammation or infection anywhere along the optic nerve's length, which can lead to disc oedema, optic neuritis, or retrobulbar neuritis. An endogenous endophthalmitis occurs when the infection and inflammation spread through the choroid and retina to affect the vitreous if the effects are widespread enough to affect these posterior tissues.

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## II. MATERIALS AND METHODS

Our study was a hospital based observational study conducted for a period of 6 months in our ophthalmology OPD, at GGH Anantapur on 20 patients of clinically diagnosed tuberculosis. Informed consent was taken from all these patients before the study. All eligible participants were informed about the study in their native tongue, and permission was acquired. General physician assessed patients whose medical histories suggested they may have pulmonary disease first. A clinical examination was completed, and necessary research was then conducted. Together with a posterio-anterior view of the chest X-ray, three morning sputum samples were collected for AFB staining.The diagnosis of pulmonary tuberculosis was confirmed by at least two sputum samples that stained positively for AFB or one sample that stained positively and had suggestive X-ray results.

Smear negativepulmonary tuberculosis was diagnosed based on suggestive X-ray findings, an adequate history, and a positive Mantoux test result that did not improve after a week of appropriate antibiotic therapy. Only patients who were diagnosed as pulmonary tuberculosis and started on Antitubercular treatment with ocular problems were considered in our study. Patients detailed history was taken by ophthalmology department for symptoms such as redness, watering, pain and diminution of vision. we then carried out a thorough visual assessment of the cases. The Snellen Vision Chart and auto refractometer were used to measure visual acuity. Colour vision testing using Ishihara chart to check for red desaturation. Extra-ocular motility and cover tests were used to assess any signs of ocular misalignment and abnormal extraocular movement. First, a diffuse torchlight examination of the anterior segment and periorbital region was conducted. A slit lamp was utilized with the proper magnification and lighting to examine the anterior and posterior segments in more detail. Volk aspheric lenses with 90 dioptres and 20 dioptres were used to examine the posterior vitreous and fundus examination under dilatation. The necessary gonioscopy was performed. In addition to examining the type and location of keratic precipitates, Posterior synechiae, anterior chamber reaction, and iris nodules, cases with uveitis were examined for signs of granulomatous or non-granulomatous inflammation.

Cells and exudates were checked in the vitreous. We also examined for snow banks, snow balls, and peripheral sheathing. Peripheral blood count, ESR, CRP, RA Factor to rule out other causes of granulomatous uveitis. Any indication of posterior uveitis, such as endophthalmitis, choroidal tubercles, tuberculoma, subretinal abscess, or choroiditis resembling serpiginous tissue, was seen. The presence of any retinal vasculitis symptoms as well as anomalies of the optic nerve, such as optic neuropathy or papilledema, were assessed.

## III. RESULTS

20 patients who were diagnosed as active tuberculosis and on Anti tubercular treatment with ophthalmic complaints among which 14 male patients and 6 female patients showing male predominance with 10 patients having Smoking history were taken into study.

- Table 1 shows sex distribution of patients having ocular complaints with active pulmonary tuberculosis.
- Columnar chart showing percentage of patients affected with different ocular diseases related to tuberculosis such as granulomatous uveitis, phlyctenular conjunctivitis, nodular scleritis and diffuse choroiditis.
- Table 2 showing the visual acuity status of patients with ocular complaints.

**Table 1 Sex distribution with ocular involvement in pulmonary tuberculosis patients**

| | Male | female | total |
|---|---|---|---|
| **Active Pulmonary tuberculosis** | 14 | 06 | 20 |

In our study, out of 20 patients 50 % (10 patients) had granulomatous iridocyclitis who were above 40 years, 20% (4 patients) had phlyctenular conjuctivitis who were below 20 years, 20% (4 patients) had nodular scleritis who were between 30-50 years & 10% (2 patients) had diffuse choroiditis (>40 years)

Fig 1 Ocular Disease

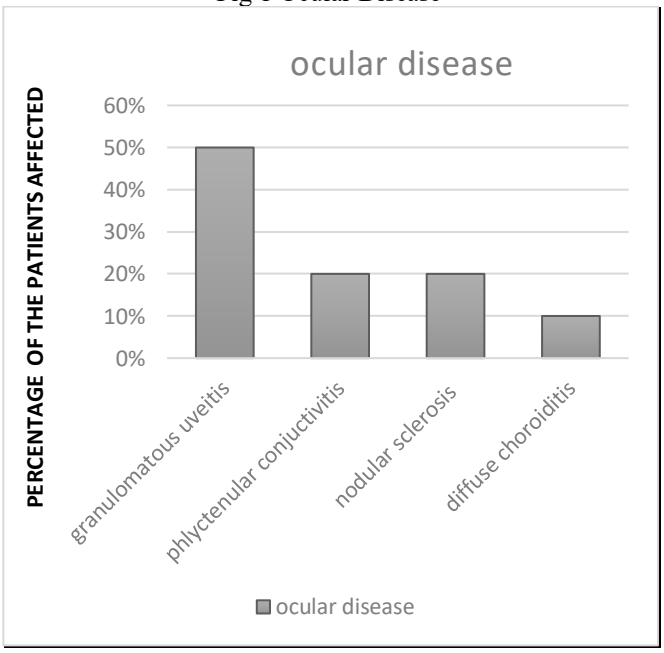


**Table 2. Visual acuity status of the patients**

| Visual acuity using snellen's chart | Number(total 20) |
|---|---|
| **6/6-6/18** | 17 |
| **< 6/18 - 6/60** | 2 |
| **< 6/60 – 3/60** | 0 |
| **< 3/60** | 1 |

Granulomatous uveitis is the most common presentation found in patients with ocular complaints with active pulmonary tuberculosis on ATT followed by phlyctenular conjunctivitis, nodular sclerosis and diffuse choroiditis

The vision was markedly affected in diffuse choroiditis patients (1patient) with vision < 3/60, 2 patients with granulomatous uveitis had vision <6/18-6/60 and remaining patients had vision between 6/6-6/18.

Patients were started on oral (TAB PREDNISOLONE 1mg/kg/body weight for 3 days followed by tapering) and topical corticosteroids such as prednisolone eye drops and cycloplegic eye drops (atropine 1% eye drops) along with ATT drugs (standard regimen provided by general physician)

**ATT (**anti tubercular treatment) treatment – TAB ISONIAZID, TAB RIFAMPICIN, TAB PYRAZINAMIDE, TAB ETHAMBUTOL – 2months (intensive phase)
- TAB ISONIAZID, TAB RIFAMPICIN – 4 months (continuous phase)
Patients were followed up initially for weekly once for 1 month followed by monthly for 3 months to check for relief of signs and symptoms and then were asked to visit whenever necessary

## IV. DISCUSSION

One of the pandemic diseases that is currently affecting worldwide populations is tuberculosis, which may damage almost any organ in the body. The conjunctiva and anterior segment of the eye are mostly affected by primary tuberculosis leading to keratitis, scleritis, ulceration, or phlyctenulosis on the cornea. Choroiditis is the most typical intraocular presentation in tuberculosis, followed by phlyctenular conjunctivitis, scleritis, keratitis, retinal vasculitis, vitritis, and posterior uveitis. Acute anterior uveitis (21.8%) and choroiditis (10.9%) were the most prevalent ocular findings in another study (Sahu et al.) (13) from India that investigated 55 patients with ocular Tuberculosis.

Another study looked at papers from different countries and found that the second most commonly observed cause of uveitis was tuberculosis (16). Ocular morbidity from tuberculosis remains important because of the high incidence of tuberculosis among individuals in developing nations, even if the percentage of ocular manifestation in tuberculosis is low. Diagnosing ocular TB can be made easier by more advanced diagnostic techniques such as PCR, which demonstrates the mycobacterial burden in intraocular fluids in conjunction with ocular symptoms of the disease. Since most developing countries still lack access to advanced diagnostic technologies, it is impossible for them to reach a conclusive diagnosis on their own. When diagnosing ocular tuberculosis, clinical characteristics remain the most crucial factor. Our study helps in describing a few of the typical symptoms that individuals with ocular TB may exhibit. It is crucial that medical professionals have information about the many signs and symptoms of Tuberculosis in the eyes in order to diagnose patients early and begin treatment before the patients experience irreversible blindness.

The most typical sign of tuberculous uveitis is posterior uveitis with diffuse choroiditis, which is frequently bilateral. In the posterior pole, there may be multiple distinct yellow lesions that range in size from a pinpoint to several disc diameters, either unilaterally or bilaterally. Lesions may have more pronounced borders with a black pigment ring around them as they grow, and the core may get paler or become yellow, resulting in an atrophic scar. Later on, subretinal neovascularization may occur. There may be vitritis, periphlebitis, vasculitis, and disc oedema. It is possible to see large solitary tuberculomas with or without macular star development and corresponding retinal detachment. Subretinal abscesses may result from caseous liquefaction of choroidal granulomas, and infections can also manifest as multifocal choroiditis or serpiginous-like choroiditis.

## V. CONCLUSION

Hematogenous spread is the most common form of ocular infection caused by tuberculosis. Any area of the eye may be affected by ocular Tuberculosis, either with or without systemic involvement. The gold standard investigation required to confirm the diagnosis is presence of M. tuberculosis in culture. Ocular fluid PCR is now available as an innovative substitute for culture.

But "presumed ocular tuberculosis" is the diagnosis in the majority of cases. The results of eye exams need to be supported by the history, chest X-ray, and TST or IGRA tests. Negative results may not rule out tuberculosis of the eyes.Treatment of ocular Tuberculosis is the same as for pulmonary Tuberculosis, timely intervention, steroid therapy and cycloplegic therapy with regular follow up is often required to prevent irreversible ocular damage.

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