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Choroidal Tubercles, an Ocular Presentation in Tuberculosis- a Retrospective Observational Hospital-based Study

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: To find the prevalence of choroidal tubercles in tuberculosis patients.

Introduction: Tuberculosis is the most common cause of infectious cause of death especially in endemic countries. Tuberculosis infection spreads hematogenously from primary infection site to rest of the body. Ocular presentation manifests in the form of choroidal tubercles being the most common fundus change.

Materials and Methods: It was a retrospective, observational hospital-based study. Total 100 tuberculosis patients were studied and their data were collected from Hospital record system from February 2020 to March 2021. Fundus examinations were reviewed and most common ocular presentation was found to be choroidal tubercles.

Observations and Results: During the study period, out of 100 patients, 60% were females and 40% were males. Fundus changes were present in 14% patients and these were choroidal tubercles in 12% patients and papillitis in 2%. Choroidal tubercles were present in 7 females and 5 males.

Conclusion: We concluded that choroidal tubercles is one of the most common form of ocular tuberculosis. Detection of choroidal inflammation can prevent visual loss as the ocular lesion resolves fully with timely management.

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Keywords: Choroidal tubercles; ocular tuberculosis; fundus examination.

1. INTRODUCTION

Tuberculosis (TB) remains the world’s leading infectious cause of death especially in endemic areas and can cause various systemic features including ocular presentation [1]. Tuberculosis infection can spread hematogenously in body and the manifestations in ocular tuberculosis could be the result of direct infection or indirect immune-mediated hypersensitivity. Increased incidence is observed in immunocompromised patients and people living in endemic countries like India [2]. Choroidal tubercles are reported in 1.4% to 60% of patients with different forms of tuberculosis [3]. Fundus examination revealed choroidal tubercles as 0.5 mm to 3 mm in diameter and greyish white or yellowish in colour, discrete with indistinct borders. They are unilateral or bilateral and are present as multiply scattered all over the fundus usually the posterior pole and less commonly the mid periphery. More advanced cases present as multiple hemorrhages or overlying serous detachment. Healed tubercles appear as pale atrophic, sharply demarcated area with variable pigmentation. Histologically the choroidal tubercles are similar to the tubercles elsewhere in the body [4-6].

2. MATERIALS AND METHODS

A retrospective, observational hospital-based study was done in a tertiary care hospital where 100 patients were studied and their data were collected from hospital record system where the Chest and TB physician and ophthalmologist opinions for bedside examination and OPD patients for fundus examination were reviewed. Information regarding age, gender, socio-economic condition, history of contact and BCG vaccination was collected. Complete systemic evaluation, investigations like chest x-ray (CXR), erythrocyte sedimentation rate, Mantoux test and

sputum for Acid Fast Bacilli was recorded. Chest X-ray was done to look for findings like mottling of lung fields. Fundus examination was done after full dilatation of pupil with direct and indirect ophthalmoscope. The diagnosis of intraocular tuberculosis was presumed to be based on suggestive ocular lesion in context of evidence of systemic infection. The triple therapy for TB that is antitubercular treatment (ATT) was started when patient confirmed as having tuberculosis. A record of 100 patients was analyzed who came in Chest & TB hospital of tertiary care centre and sent to Eye OPD for fundus examination to look for choroidal tubercles from February 2020 to March 2021.

3. RESULTS

Out of 100 patients studied where 60 % were females and 40 % were males. Fundus changes were present in 14 patients (14%) and these were choroidal tubercles in 12% patients and papillitis in 2% in latent stage of TB. Choroidal tubercles were present in 7 females (out of which 6 were from rural areas and 1 from urban area) and 5 males (out of which 2 were from rural areas and 3 from urban areas) [Fig 1]. Females are affected more especially in rural areas as the neglected part of Indian society and the socioeconomic conditions affecting their health. Most common age group manifesting ocular TB is between 21 to 40 years, corresponding to 8 out of 12, out of which 5 were from rural areas and 3 from urban areas [Table 1]. Fundus picture showing choroidal tubercles with or without associated vitritis are in shown in Fig 2 and 3 respectively. Patients presenting with papillitis also showed relative afferent pupillary defect (RAPD) while examining pupillary reactions that helped to confirm papillitis in ocular tuberculosis [Fig 4]. The statistical analysis was done using the Chi square test and analysed by using the SPSS software version 15.

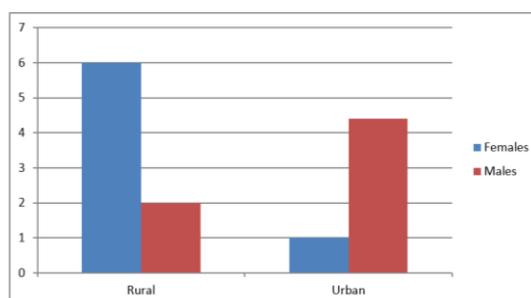


Fig. 1. Sex wise distribution of choroidal tubercles

Table 1. Age wise distribution of choroidal tubercles

Age group (years)	Rural	Urban
0-20	2	1
21-40	5	3
41-60	1	0



Fig. 2. Fundus picture showing choroidal tubercles (in the presence of vitritis thus media appears to be hazy)

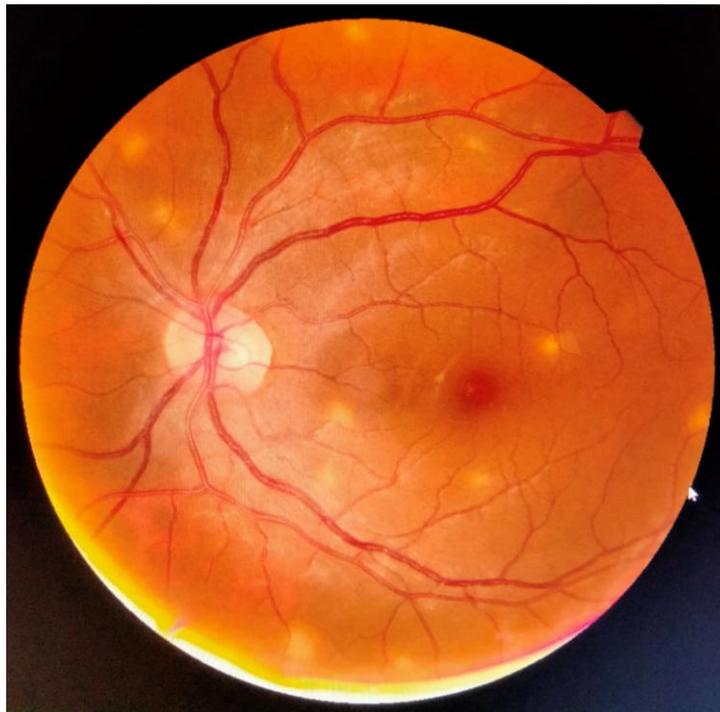


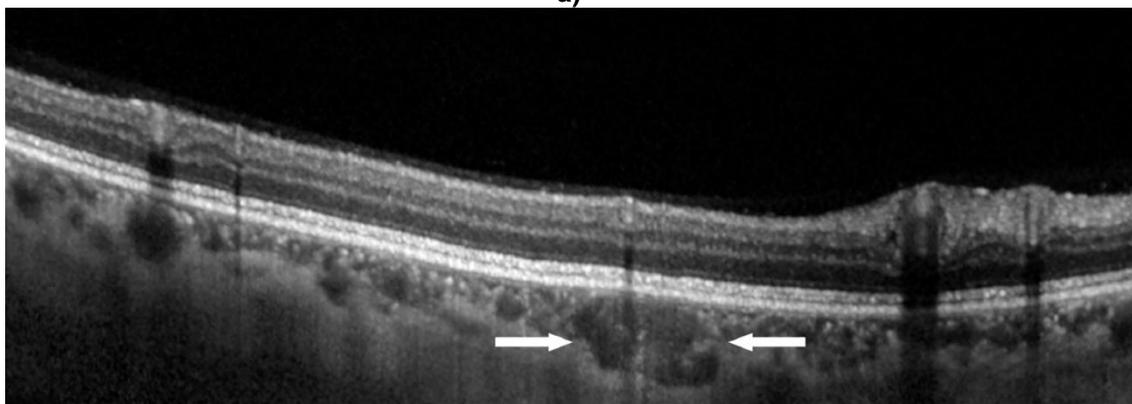
Fig. 3. Fundus picture showing choroidal tubercles (vitritis absent and media appears to be clear)



Fig. 4. Fundus picture showing papillitis in ocular tuberculosis patient



a)



b)

Fig. 5. OCT images showing choroidal tubercle (white arrows) Increased reflectivity in the deeper retinal layers over the granuloma

4. DISCUSSION

Tubercular uveitis is classically a chronic granulomatous uveitis. Choroid is most commonly involved in ocular TB patients that occur with or without associated vitritis as shown by Fig. 2 and 3 respectively. Choroidal tubercles are its most common manifestation. Choroidal tubercles develop as a result of hematogenous spread and due to immune mediated hypersensitivity reaction to tubercular antigens [7-10]. Jabbour et al. noted an early hyper fluorescence within the lesion that increased in intensity and size on fluorescein angiography due to dye leakage into the surrounding serous detachment and late leakage from the lesion [11]. A variation was observed by Milea et al. who described early prolonged blockage and late moderate hyper fluorescence of the tuberculoma [12]. Tayanc et al. reported hypo fluorescence of the choroidal tuberculoma in all phases on indocyanine green angiography and demonstrated that tubercles are more in number on ICG angiography [13]. Choroidal tuberculomas can be present in latent tuberculosis that should be treated with anti-tubercular treatment (ATT). OCT findings shows an area of localized adhesion between the choriocapillaris-RPE layer and overlying the neurosensory retina as tubercles. There is increased reflectivity in the deeper retinal layers over the granuloma [Fig-5a,b] [14]. PCR, vitreous or fine needle aspiration biopsy can be done to confirm the difficult cases to differentiate it from other possible diagnosis [15]. Nowadays, polymerase chain reaction is being increasingly used for diagnosis [16]. Apart from angiography, RT-PCR can be done to detect mycobacterial load in ocular TB patients [17].

5. CONCLUSION

A choroidal tuberculoma is one of the most common forms of ocular tuberculosis. Early diagnosis of choroidal tubercles during fundus examination can prevent visual loss as the ocular lesion resolves fully with timely management [18]. Moreover, latent tuberculosis can be incidentally found on fundus findings and thus, early treatment can be instituted in such patients.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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