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OPHTHALMOLOGY | RESEARCH ARTICLE

Pattern of presumed tuberculous uveitis in a tertiary eye care centre of Nepal

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Abstract: Purpose: To evaluate the pattern of presumed tuberculous uveitis and its various clinical presentation. Methods: This hospital based, cross-sectional descriptive study was conducted in B.P. Koirala Lions Centre for Ophthalmic Studies, Kathmandu, Nepal from January 2013 to June 2014. All uveitis patients presenting to uveitis clinic were included in the study. A complete ophthalmic examination, systemic evaluation and tailored investigations were done for each individual patient and the findings were recorded. Results: Out of 1140 uveitis patients evaluated, 12 patients (1.05%) had presumed tuberculous uveitis. Panuveitis (five patients, 41.7%) was the most common form of uveitis, followed by posterior (four patients, 33.3%) and anterior uveitis (three patients, 25%). All patients showed signs of clinical resolution after the institution of anti-tuberculous therapy along with drugs for the control of intraocular inflammation. Conclusion: Panuveitis and posterior uveitis were the common forms of clinical presentation of presumed tuberculous uveitis in this study. Treatment with anti-tuberculous therapy along with drugs to control intraocular inflammation resolves presumed tuberculous uveitis.

Subjects: Immunology; Infectious Diseases; Ophthalmology

Keywords: anti-tuberculous therapy; intraocular inflammation; panuveitis; posterior uveitis; presumed tuberculous uveitis

ABOUT THE AUTHORS

The authors involved in this article are working on the field of uveitis and TB. More specifically, they are interested to determine and identify the tubercular uveitis at earlier stage in order to reduce the burden and morbidity of the condition.

The research work in this paper addresses the various pattern in which tuberculous uveitis can present. Every minute detail of the clinical presentation and laboratory investigations are vital for the diagnosis and appropriate treatment of tuberculous uveitis.

PUBLIC INTEREST STATEMENT

Tuberculosis (TB) remains a major global health problem and it was estimated that 10.4 million people fell ill from TB in 2015 alone. TB can affect many organ systems including eye causing inflammation that can lead to various disease state. It can cause blindness if not diagnosed in time or if there is delay in the appropriate treatment. This can add financial burden as well as can affect mental health of the patients due to the detrimental effects on patients' vision. However, scientific data regarding the scale of the disease are varying and not uniform throughout the world. Understanding the scale of distribution of the disease can help explore the issues to reach broader number of suffering patients and to provide with proper treatment, which can reduce the burden of the disease and can save patients' sight.

1. Introduction

Tuberculosis (TB) remains a major global health problem, responsible for ill health among millions of people each year and it is estimated that 10.4 million people fell ill from TB (World Health Organization Global TB report, 2016). TB is commonly described as a systemic disease of protean manifestations that involves many organ systems including eye, although ocular TB has always been considered rare. General consensus regarding the incidence of ocular TB has varied widely among the authors with reports varying across the time, distribution of population, and geography. In 1941, Guyton and Woods reported TB as a cause to 80% of granulomatous uveitis cases with subsequent decline in number over the years. By 1960, only 20% of uveitis cases were reported to be secondary to TB (Woods, 1960). Currently, tuberculous uveitis accounts for a relatively small number of cases in developed countries. Wakabayashi et al. and Mercanti et al. reported that 6.9% and 7% of uveitis cases were secondary to tuberculosis, respectively (Mercanti, Parolini, Bonora, Lequaglie, & Tomazzoli, 2001; Wakabayashi, Morimura, Miyamoto, & Okada, 2003). Singh et al. reported TB as the cause of uveitis in 125 patients (10.1%) out of 1233 patients in India (Singh, Gupta, & Gupta, 2004).

Because of the lack of standardized diagnostic criteria and definition for tuberculous uveitis, and the difficulty of confirming the diagnosis by laboratory methods, epidemiologic data for tuberculous uveitis are considered unreliable. Definite diagnosis relies on demonstration of tubercle bacilli in ocular tissue and fluid but this is fraught with difficulty of obtaining ocular tissue for biopsy in eyes due to the invasive nature of the procedure. Lack of any uniform diagnostic criteria for intraocular TB has made its diagnosis and management difficult and confusing at times. However, a review by Gupta et al. had given an update on intraocular TB and a new approach for establishing the diagnosis and clinical management of ocular TB with emphasis on its clinical spectrum, laboratory investigation, and diagnostic criteria (Gupta, Gupta, & Rao, 2007).

Tuberculous uveitis is classically a chronic granulomatous disease that causes mutton-fat keratic precipitates, iris nodules, posterior synechiae, and secondary glaucoma (Rosen, Spalton, & Graham, 1990). Non-granulomatous uveitis may also occur, and there may be anterior and/or posterior inflammation (Duke-Elder & Perkins, 1967). Making the correct diagnosis has important therapeutic consequences, since tuberculous uveitis should be treated with anti-tuberculous drugs to prevent visual loss instead of immunosuppressive drugs only.

2. Methods

This hospital based, cross-sectional descriptive study was conducted in Department of ophthalmology, B.P. Koirala Lions Centre for Ophthalmic Studies, Institute of Medicine (IOM), Tribhuvan University, Kathmandu, Nepal from 1 January, 2013 to 30 June, 2014. All uveitis patients presenting to uveitis clinic were included in the study.

A complete ophthalmic examination, systemic evaluation and investigations were done for each individual patient and the findings were recorded. Standardization of the Uveitis Nomenclature (SUN) working group classification was used to classify the uveitis and grade the uveitis activity (Jabs, Nussenblatt, & Rosenbaum, 2005).

Among the uveitis patients suspected of tubercular origin were evaluated for the signs of tuberculous uveitis like granulomatous or non-granulomatous anterior uveitis with broad posterior synechiae, iris nodules, ciliary body tuberculoma, granulomatous intermediate uveitis, choroidal tuberculoma, subretinal abscess, serpiginous-like choroiditis, retinitis/vasculitis, and endophthalmitis.

In this study, the diagnostic criteria of Ocular TB proposed by Gupta et al., was used to define the presumed tuberculous uveitis (Supplemental file 1) (Gupta et al., 2007). All positive findings were re-assessed and confirmed by two uveitis specialists (D.N.S. & R.K.S). Patients with evidence of

ocular TB involvement were evaluated for systemic TB and followed-up after 4 weeks of anti-tuberculous and anti-inflammatory drugs and were labelled to have partial response if showing clinical improvement of ocular lesions during this time period. Only those patients who completed and followed up till the completion of full treatment course were included in the study. All patients who were strongly suspected to have a cause for their uveitis other than TB received treatment as clinically indicated and were not further considered for this study.

This study was approved by the local ethics committee of Tribhuvan University and adhered to the tenets of the Declaration of Helsinki. Informed consents were obtained from all the patients prior to the enrollment in the study.

3. Statistical methods

The patients' data were recorded and analysed using SPSS (Statistical Package for Social Sciences) program software version 20.

4. Results

Of the 1140 uveitis patients evaluated during the study, 12 (1.05%) patients had presumed tubercular uveitis. The mean age of presentation was 33.83 years (range 12–57 years) and the patients between 21 and 40 years of age constituted 66.6% of the study group. The male to female ratio was 1:2. Only three patients (25%) at some stage have been in close contact with a family member treated for TB in the past 2 years.

Among the patients with presumed tuberculous uveitis, four (33.3%) had bilateral involvement and eight (66.6%) had unilateral involvement (Table 1).

One patient (8.3%) had pulmonary TB and five patients (41.7%) had extrapulmonary TB at non-ocular site. However, in six patients (50%), there was no evidence of active systemic TB and they showed 10 mm or more of induration after undergoing Mantoux skin testing. The other six patients did not require tuberculin skin testing as they were already diagnosed with active TB.

Panuveitis (five cases, 41.7%) was the most common form of uveitis, followed by posterior (four cases, 33.3%) and anterior uveitis (three cases, 25%) in the study. Three patients (25%) had choroidal tubercles (Figures 1 and 2) and one patient (8.3%) had both choroidal tubercles and retinal vasculitis with vitreous hemorrhage. Seven patients (58.3%) had granulomatous keratic precipitates (Figure 3); eight (58.3%) had broad posterior synechiae; four (33.3%) had iris nodules.

The activity of uveitis became quiescent after 2 months of the anti-TB drug therapy and topical/systemic steroid treatment. In 4 patients, systemic steroid was also initiated based on clinical severity of ocular inflammation and was gradually tapered over the following weeks. There was no recurrence at the end of 6 month of follow-up.

Nine patients (75%) had two or more lines of improvement in visual acuity compared to presenting visual acuity, two patients' (16.7%) visual acuity worsened due to complicated cataract and macular

Table 1. Laterality according to anatomical classification

Type of uveitis	Anterior uveitis		Intermediate uveitis		Posterior uveitis		Panuveitis		Total (n)
	(n)	%	(n)	%	(n)	%	(n)	%	
Unilateral	3	25	0	0	2	16.6	3	25	8
Bilateral	0	0	0	0	2	16.6	2	16.6	4
Total	3	0	0	0	4	33.2	5	41.6	12

Figure 1. Fundus photograph of a 23-year-old male patient showing choroidal tubercle.

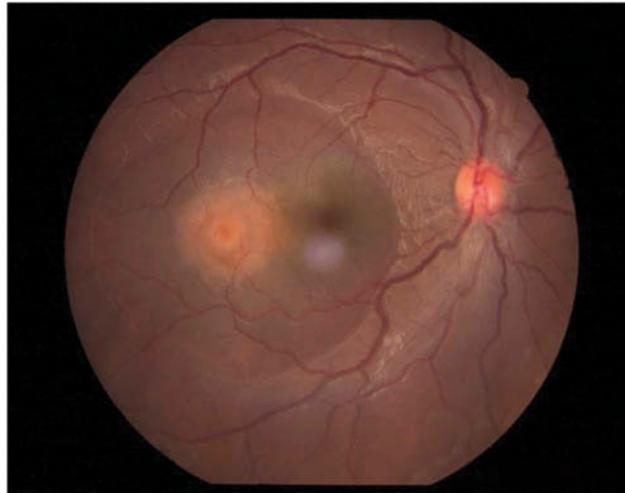


Figure 2. Optical coherence tomography (OCT) image of macular region showing choroidal tubercle of the same patient from Figure 1.

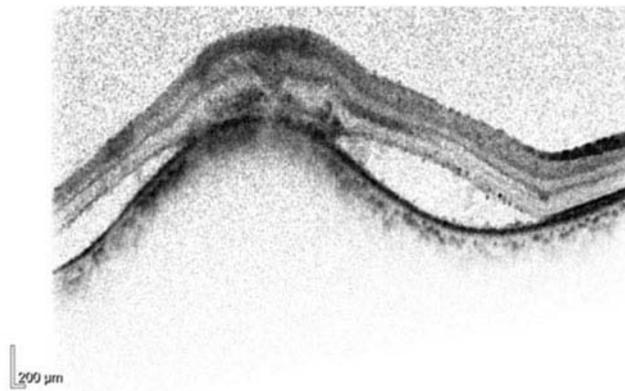
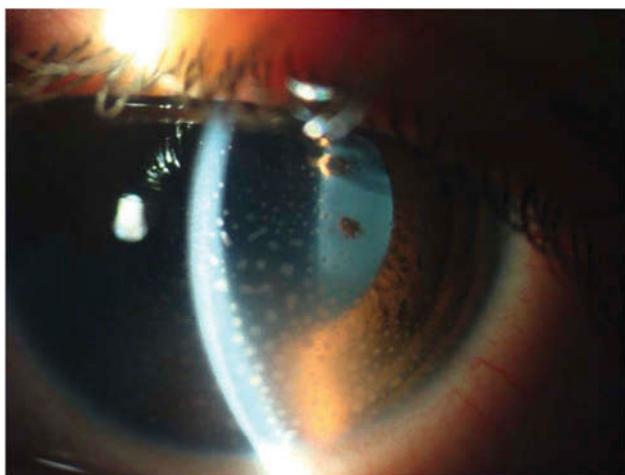


Figure 3. A 43-year-old female patient with granulomatous anterior uveitis with mutton fat keratic precipitates.



scarring, respectively. One patient (8.3%) had no change in their visual acuity despite the evidence of complete resolution of ocular inflammation at the end of completion anti-tuberculous drug treatment course. No patient developed any side effects of anti-tuberculous drug therapy.

5. Discussion

In the present study, 12 patients (1.05%) were diagnosed as presumed tuberculous uveitis. Biswas et al. reported the ocular morbidity of 1.39% among the 2010 eyes of 1005 patients with active TB (Biswas & Badrinath, 1996). Similarly, Donahue et al. reported an incidence of ocular TB of 1.46% in 10,524 patients from a TB sanitarium (Donahue, 1967). A prospective study of Bouza et al. examined 100 randomly chosen patients with proven systemic TB and found ocular involvement in 18 patients (18%) (Bouza et al., 1997). The other recent study conducted in Philippines reported 6.8% incidence of ocular manifestations in 103 pulmonary TB patients (Lara & Ocampo, 2013). As definitive diagnosis of ocular TB is difficult to make, differences in reported incidence of ocular TB could also be due to differences in diagnostic criteria set by the respective studies.

In this study, majority of patients had bilateral eye involvement and females were affected twice more than male. However, in the study by Lara and Ocampo, there was no gender predilection between those with presumed ocular TB and those without, and had only unilateral involvement (Lara & Ocampo, 2013).

The most common form of presentation of presumed ocular TB in this study was panuveitis (five patients, 41.7%) (Table 1). In a series of 37 patients with the clinical diagnosis of presumed tuberculous uveitis followed at Italian and Swiss Centres, 26 patients (70.3%) presented with granulomatous panuveitis (Cimino, Herbort, Aldigeri, Salvarani, & Boiardi, 2009). Biswas et al. reported bilateral healed focal choroiditis (50%) as the most common ocular finding in the study (Biswas & Badrinath, 1996).

All patients showed signs of clinical resolution and the activity of uveitis became quiescent after 2 month of the treatment without any recurrences. In the study by Vos et al., there was clinical improvement in ocular inflammation in seven out of 10 patients of tuberculous uveitis after receiving anti-tuberculous drugs (Vos, Wassenberg, de Hoog, & Oosterheert, 2013). Similarly, Gineys et al. and Sanghvi et al. also found that 60% and 70%, respectively, of the patients showed clinical improvement after receiving anti-tuberculous drugs for presumed tuberculous uveitis (Gineys et al., 2011; Sanghvi, Bell, Woodhead, Hardy, & Jones, 2011). Anti-tuberculous treatment drugs, specifically Ethambutol have been shown to cause ocular toxicity at standard doses, making early recognition of ocular symptoms a priority to prevent unnecessary delay in diagnosis and irreversible visual loss (Garg, Garg, Prasad, & Mishra, 2015). However, no patient developed any side effects of anti-tuberculous drug use in this study.

6. Conclusion

Panuveitis and posterior uveitis are the common forms of clinical presentation of presumed tuberculous uveitis. Treatment with anti-tuberculous therapy along with drugs to control intraocular inflammation resolves presumed tuberculous uveitis.

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Competing interests

The authors declare no competing interests.

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