Original Article

Frequency and Visual Outcome of Choroidal Tubercles with Miliary Tuberculosis

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Pak J Ophthalmol 2014, Vol. 30 No. 4

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Purpose: To determine the frequency and visual outcome of choroidal tubercles in diagnosed cases of Miliary Tuberculosis.

Material and Methods: A prospective study was conducted at Department of Ophthalmology and institute of Chest Disease (OICD) Dow University Hospital (DUH), Dow International Medical College (DIMC) and Dow University Of Health Sciences (DUHS) Karachi, 24th April, 2010 to 23rd November, 2013. Two hundred and seventy two (272) diagnosed cases of Miliary Tuberculosis referred from Ojha Institute Of Chest Disease (OICD) to our department were included in the study. Detailed examination at the first visit was conducted and then after 2 months and 6 months. Complete examination including visual acuity, color vision, refraction, slit lamp examinations, intraocular pressure (IOP), and posterior segment evaluation after pupil dilatation was performed. Fundus photographs were also taken. Data was recorded and analyzed in SPSS version 16. Frequencies and percentages were calculated for age, gender and visual outcome.

Results: Two hundred and seventy two (272) cases were included in the study. Age ranges from 10 to 80 years with mean age being 45 years. There were 140 (51.41%) female and 132 (48.53%) males. Among these two hundred and seventy two (272) cases, 14 (5.14%) had choroidal tubercles. They were all on anti tuberculous treatment. Visual acuity improved from less than 6/60 to 6/9 or 6/6 in majority of cases after completion of treatment and healing of choroidal tubercles was also noted.

Conclusion: The study is unique and done for the first time in Pakistan. Frequency of choroidal tubercles with diagnosed cases of Miliary Tuberculosis is 5.14% with gender distribution female to male was 8:6. Visual outcome is better if the patient is screened early and treated promptly.

Key Words: Choroidal Tubercles, Miliary Tuberculosis, Visual outcome

Tuberculosis (TB) is the leading infectious cause of morbidity and mortality worldwide.[1-2] It is one of the major public health problems in Pakistan and ranks fifth among TB high-burden countries worldwide. The incidence of TB in Pakistan by World health organization is 231 / 100,000. In 2012, The number of TB cases diagnosed increased from 20,707 in 2001 to 26, 7 912 in 2010.[3]

TB is caused by Mycobacterium tuberculosis (MTB). It primarily affects the lungs but can affect other organs including the eye.[4-5] TB in eyes can affect lids, conjunctiva, cornea, iris, choroid and retina. Involvement of TB in choroid appears as choroidal tubercles. . If choroidal tubercles are untreated, it can lead to blindness. Involvement of both lungs with military infiltrates is known as M.T .In Miliary Tuberculosis, whole body is studded with similar infiltrates. The diagnosis of choroidal tubercle is mainly based on clinical findings. Both clinical and histopathological descriptions are available in

Fig. A: Re – Treatment (initial) Fundus Photograph

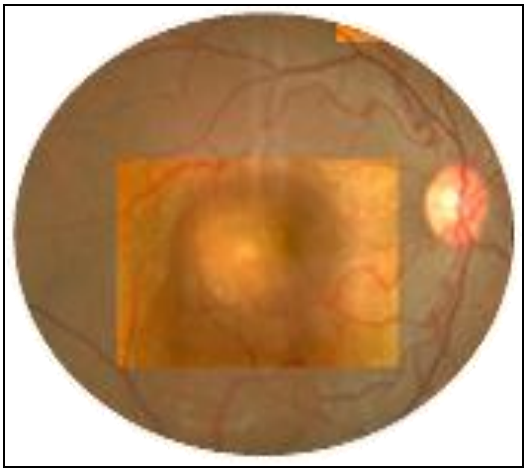

Fig. A1: Right eye: Choroidal tubercle of about 3 disc diameter with exudative retinal detachment at macula

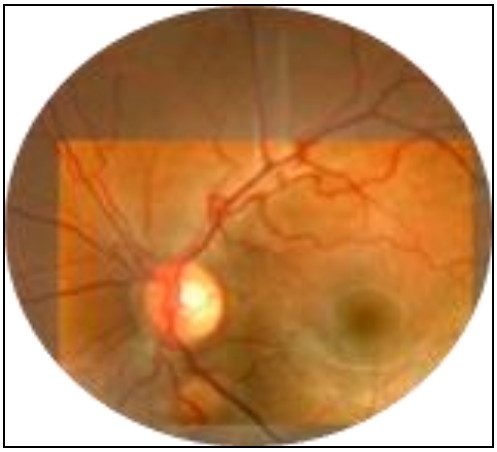

Fig. A2: Left eye pre treatment (initial): Small choroidal lesion inferior to the disc of about 1/2 disc diameter

Fig. B: Post-Treatment Fundus Photograph First Follow up at two months

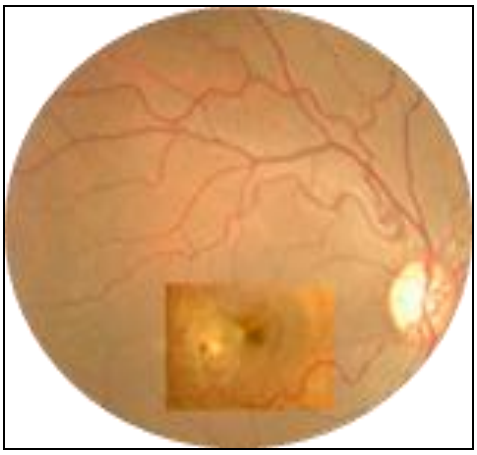

Fig. B1: Right eye: Resolution of choroidal tubercle with exudative retinal detachment

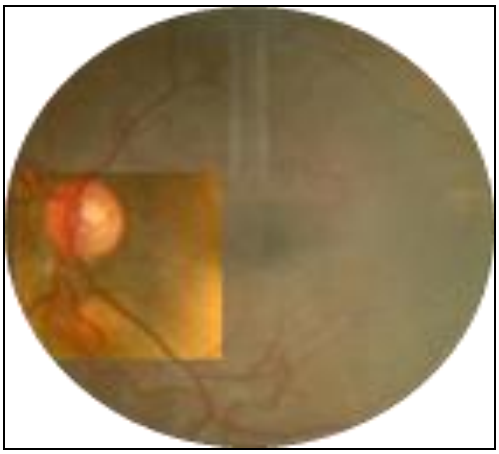

Fig. B2: Left eye: inactive choroidal tubercle below the disc at two months

literature.[13,14-16] Culture or direct histopathological examination of infected tissue can provide definitive proof but it is highly associated with risk of intraocular infection in cases of active ocular inflammation. All our cases were diagnosed clinically, radiologicaly and by laboratory investigation in Ojha Institute of Chest Diseases (OICD). All patients were assigned to standard treatment protocol consisting of two months intensive phase followed by 4 to 6 months of consolidation phase. The first phase drugs were Rifampicin, Isoniazid, Ethambutol and Pyrazinamide. During consolidation phase patients received Rifampicin and Isoniazid. Dose was adjusted according to patients' weight. Patients were followed both by treating physician and eye department. Serum uric acid and liver function test were followed during 1st two months. Visual outcome is better if the patient is screened early and treated promptly. However increase in number of cases of TB worldwide with ocular symptoms needs thorough investigations to rule out choroidal tuberculosis. Visual outcome is better if the patient is screened early and treated promptly.

Due to its effects on eye sight and increase in the incidence rate of Miliary Tuberculosis patients in Pakistan, we conducted this study in our department to find out the frequency and visual outcome.

Fig. C: Post – Treatment Fundus Photograph Second Follow up at six months

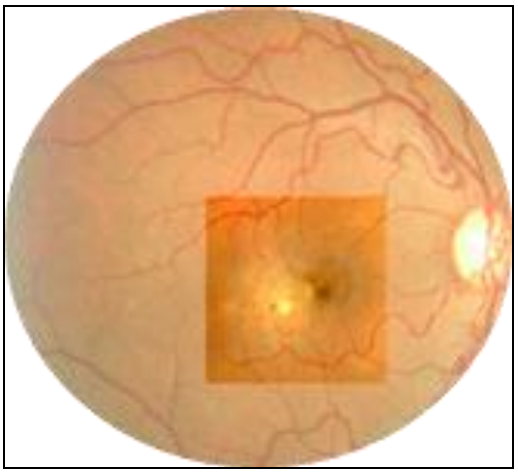

Fig. C1: Right eye: complete regression of choroidal tubercle with pigmentary changes at macula

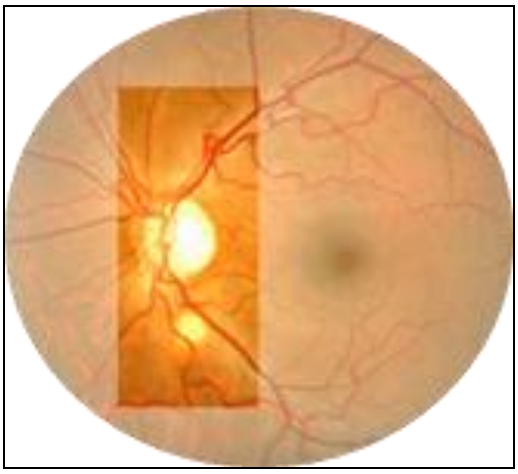

Fig. C2: Left eye: inactive choroidal tubercle below the disc at six months

MATERIAL AND METHODS

Two hundred and seventy two (272) cases were included in the study referred from Ojha Institute of Chest Disease (OICD) Karachi with confirmed diagnosis of Miliary Tuberculosis.

All patients above 10 and below 80 years of age with diagnosis of Miliary Tuberculosis were included in the study.

Patients already taking treatment for over one month excluded. Patients with glaucoma, maculopathy, media opacities (cornea or vitreous) cataract and visual pathway problem, patients with acute anterior uveitis, diabetes with advanced retinopathy, irregular anitubercular treatment, ,poor follow up and patients with previous ocular trauma were excluded from study. Freshly diagnosed cases of MTB were included in the study.

This observational, descriptive study was conducted at department of ophthalmology from 24th April 2010 to 23rd November 2013. Diagnosed cases of miliary tuberculosis referred from OICD were included in the study. A total of 272 cases were enrolled. A careful history was taken from each patient and recorded on a Performa which included: name, age, gender, address, presenting complaints and their duration.

Complete ocular examination was done and findings were recorded on a Performa, which included uncorrected and corrected visual acuity, slit lamp examination, tonometry, fundoscopy and fundus photography.

The diagnosis of choroidal tubercle in our cases is mainly based on clinical finding as both clinical and histopathological descriptions are available in literature.[13,14-16] Also the cases in our study were all diagnosed cases of miliary tuberculosis referred from Ojha Institute of Chest Diseases (OICD). Their diagnosis were made on clinical examination, radiological findings and laboratory investigations.

Choroidal tubercles in number, site and size were noted. Record of visual acuity at the beginning and completion of treatment as mentioned in the introduction, were noted at follow up visits.

RESULTS

Total of 272 patients were included in the study. Among these cases, 14 (5.14%) had choroidal tubercles with male to female ratio was 8:6. They were all on anti tuberculous treatment.

In majority of cases choroidal tubercles were unilateral and ranged in size from 1 to 2 disc diameter (DD). They were mostly localized at the posterior pole. The lesions number ranged from 5 to 10. The appearance initially was yellow and pigmentation occured later on. In one case choroidal tubercles were associated with serous retinal detachments. Pre-treatment Fundus photography of patient with choroidal tubercles given in Figure A. (A1, A2) Post

treatment fundus photography of patient with choroidal tubercles in first and second follow up visit given in Figure B (B1, B2) and Figure C (C1, C2).

All cases had a best corrected visual acuity of 6/9 or better after six months treatment with anti tubercular therapy.

DISCUSSION

Tuberculosis is one of the leading infectious causes of morbidility and mortality worldwide. Miliary tuberculosis is a complication of pulmonary tuberculosis. Unfortunately Pakistan is also facing this major health problem and stand among the five high burdened countries in the world. According to world health organization the incidence of TB is increasing day by day.

The recognized association of TB with eye complications dates back to the 17th century, when iris lesions in TB patients were described.[6] Recognition of choroidal tubercles in the medical literature was first noted between 1830 and 1844.[7] It is estimated that 1.4% of persons with Pulmonary TB (PTB) develop ocular manifestations[8,9] but many patients with ocular TB have no evidence of PTB.[10–12] The diagnosis of ocular TB is important because prompt treatment may improve the individual patient's outcome. Delayed diagnosis can lead to pain, vision loss, and systemic complications of the infection.

Extensive literature and studies are available on Miliary Tuberculosis and its ocular involvement. However, to our knowledge, there is no study in Pakistan so far to determine frequency of choroidal tubercles and visual out-come in diagnosed cases of Miliary Tuberculosis. In our study all 272 patients were diagnosed cases of Miliary TB and referred from Ojha Institute of Chest Disease (OICD) Karachi. They were all taking standard anti Tuberculous treatment regularly. We only confined our study on frequency of choroidal tubercles and their visual outcome. Among 272 cases only 14 (5.4%) patients were found to have choroidal tubercles. All patients having choroidal tubercles had decreased vision improved on completion of treatment as shown in Table 2.

Choroidal tubercles are seen in 1.4% to 60% of patients with different forms of TB reported in many studies.[18,19] In Malawi, Africa, a 2.8% incidence of choroidal granuloma in 109 patients with fever and tuberculosis was reported in a prospective study in 2002.[20]

Table 1: Characteristics of Study Population (n = 272)

Variables	No. of Patients n (%)
Age in Years	
10 - 40	130 (47.79)
41 - 60	111 (40.81)
61 - 80	31 (11.40)
Gender	
Female	140 (51.47)
Male	132 (48.81)

Table 2: Cases of Miliary Tuberculosis having choroidal tubercle

Variables	No.
Presenting Complaints	
Decrease Vision	13
Watering and Itching	1
Systemic Disease	
Patients on Anti Tuberculous Treatment (ATT)	
Five (5) Days	2
One (1) Month	3
Three (3) Months	3
Six (6) Months	6
Color Vision	
Normal Color Vision	13
Decreased Color Vision	1
Cause of Low Vision	
Macular Involvement with choroidal tubercles	8
Early Cataract	4
Serous Retinal Detachment	2

Table 3: Visual Acuity before and after treatment

No. of Patients	Visual Acuity Prior to Treatment	Visual Acuity After Treatment
2	Less than 6/60	6/36
4	6/60 to 6/12	6/12 to 6/9
8	6/12 to 6/6	6/9 to 6/6

Table 4: Frequency of cases with researchers and years in which choroid tubercles were found

Researcher's	Year	No. of Cases	No. of Cases in which Choroid Tubercles were Found
Mirza Shafiq Ali Baig et al.	2014	272	14
Debre et al[22]	1974	84	22
Moore[23]	1922	33	10
Groenouw[24]	1920	225	54
Marple[25]	1913	13	13
Carpenter and Stephenson[26]	1905	42	21
Litten[27]	1877	53	39

The frequency with which various investigators[21] found choroidal tubercle is given in the Table 4. Our study correlates with the above mentioned studies. However our study is from a single center and city. Therefore we suggest that the scope of the study in future must be multi center and involves various parts of the country.

Choroidal tubercles are the most recognized lesions in intraocular TB, with both clinical and histopathologic descriptions available in the literature[13,14–16]. The tubercles are located deep in the choroid, presenting unilaterally (more commonly) or bilaterally as yellowish lesions, discrete with ill-defined borders and typically elevated centrally. Most commonly situated in the posterior pole, these are solitary or few in number. Inflammatory cells may be present in the anterior chamber or vitreous cavity. Subretinal fluid may be present. Histological examination reveals granulomatous inflammation, caseation necrosis and Acid fast Bacilli (AFB). Varying degrees of marginal pigmentation and scar formation occured with their healing.[17]

If untreated, a choroidal tubercle may grow into a large tumor-like mass called tuberculoma. It is seen as a yellowish, elevated mass-like lesion mimicking an abscess that is subretinal, with surrounding retinal detachment. Choroidal tubercles are localized in the choroid, but may rarely rupture the Bruch's membrane, and invade the subretinal space and the vitreous cavity, causing widespread intraocular inflammation, necessitating vitrectomy.[16] Poor vision at presentation may be due to tubercles located in and around the macula with surrounding subretinal fluid. Peripheral tubercles are usually asymptomatic unless associated with anterior segment inflammation.

CONCLUSION

The study is unique and done for the first time in Pakistan. Frequency of choroidal tubercles with diagnosed cases of Mliary Tuberculosis is 5.14%, with gender distribution female to male was 8:6. Visual outcome is better if the patient is screened early and treated promptly

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