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Ocular Toxoplasmosis: Clinical Characteristics and Management

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ABSTRACT

***Introduction**: Ocular toxoplasmosis is a major cause of infectious posterior uveitis worldwide. There was no exact number of ocular toxoplasmosis prevalence in Indonesia, but Indonesia was considered to have high seroprevalence in Southeast Asian. This study is conducted to determine clinical characteristics and management of ocular toxoplasmosis at outpatient clinic of Dr. Saiful Anwar General Hospital in Malang, East Java.*

***Methods**: This was retrospective study. We reviewed the medical records of patients with ocular toxoplasmosis and collected the data associated with age, sex, laterality, visual outcome, type of lesions, serum serological titers, therapeutic regimens, and complications.*

***Result**: There were 48 eyes from 38 patients included in this study, mostly were female (66%) with mean age was 33,5 years. Unilateral infection (71%) was more frequent than bilateral cases (39%). Active lesions were found more than cicatrical lesions (56,25%). Most patients with active diseases had unilateral lesion (87,5%). The most common presenting complain was blurred vision (73%). Most of lesions (22 eyes; 81,4%) were located on macular region. All of patients have positive IgG antitoxoplasma serum. There were 22 patients received oral Trimethoprim-Sulfamethoxazole and steroid. Visual acuity improved in 6 patients at the end of follow-up period. Complications of retinal detachment and choroidal neovascularization were found in 3 patients.*

***Conclusion**: Active ocular toxoplasmosis is more likely to be unilateral infection with main presenting complain is blurred vision. Most of our patients show good responses to oral trimethoprim-sulfamethoxazole and steroid.*

Keywords: Ocular toxoplasmosis, retinochoroiditis toxoplasmosis, headlight in the fog, infectious uveitis, toxoplasma gondii

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INTRODUCTION

Ocular toxoplasmosis is considered as the major cause of infectious retinochoroiditis worldwide, eventhough the prevalences may varies among countries.1 In United States, the seroprevalence of T.gondii infection is 22.5%, but the prevalence of ocular toxoplasmosis is estimated to be only 2%. In Southern Brazil, the seroprevalence is 85% of the population and 18% manifest evidence of retinochoroiditis.2,3 There was no exact number of ocular toxoplasmosis prevalence in Indonesia, but Indonesia was considered to have high seroprevalence, has been reported from 43 to 88% in some regions.[4,5]

The duration of active retinal infection (i.e., proliferation of tachyzoites) and the intensity of the associated inflammatory reaction appear to be the major factors accounting for variations in the characteristics of ocular toxoplasmosis. T. gondii is rarely identified in ocular tissues other than the retina. Therefore, typical clinical finding of ocular toxoplasmosis gives the features of 'headlight in the fog', focal necrotizing chorioretinitis on the macular area

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with overlying dense vitritis, usually next to or near the previous chorioretinal scar. Significant visual deterioration may results from marked vitritis and macular or optic nerve involvement. Atrophic macular scar or optic nerve atrophy may contributes to permanent blindness. [3,6,7]

Due to the limited data of the incidence of ocular toxoplasmsis in Indonesia, we conducted a retrospective study to determine clinical characteristics and management of ocular toxoplasmosis in Malang, East Java. The data from our study may bring new perspectives regarding ocular toxoplasmosis in Indonesia.

METHODS

Medical records review of patients with ocular toxoplasmosis from the outpatient clinic of Dr. Saiful Anwar General Hospital, from January 2013 to December 2015, was conducted. Ethical clearance was approved by hospital medical ethics committee. Diagnosis was made based on characteristic clinical findings, active retinochoroiditis toxoplasmosis featured focal retinitis with overlying dense vitritis with or without presence of adjacent pigmented retinochoroidal scar, and latent lesion was described as pigmented retinochoroidal scar without active inflammation. Location of lesions were also recorded. Serological serum examination was performed to confimed the exposure. The data collected were age at the time of diagnosis, gender, laterality, visual acuity, disease activity, serological serum titers, regiment of treatment, and complications. Visual acuity were converted into LogMAR. Follow-up data were taken from final visit when the medications were completed or the last visit if patients were lost to follow-up. Patients with incomplete medical records were excluded. Categorical data were tabulated in numbers and percentages then presented by tables and graphics.

RESULTS

There were 48 eyes from 38 patients included in this study. Demographic data for all patients were showed in table 1. Ophthalmic data for all eyes at initial presentation were showed in table 2.

Table 1. **Demographic data at initial presentation.**

Female gender	25 (66%)
Age (years)	
Mean ± SD	33.5 ± 16.2
Median (range)	31 (9 to 70)
Occupation	
Farmer	16 (42.1%)
Student	9 (23.7%)
Civil servant	4 (10.5%)
Army	2 (5.3%)
Other	7 (18.4%)

Table 2. **Ophthalmic data at initial presentation**

Presenting symptoms	
Blurred vision	29 (76.3%)
Floaters	5 (13.2%)
Both	4 (10.5%)
Laterality (patients)	
Unilateral	27 (71.1%)
Bilateral	11 (28.9%)
Disease activity (eyes)	
Active lesion	27 (56.3%)
Retinochoroidal scar	21 (43.7%)
Serological serum titer	
Positive IgG	34 (89.5%)
Positive IgM and IgG	3 (7.9%)
No data	1 (2.6%)
Systemic medications[a]	
Antimicrobial	24 (100%)
Corticosteroid	23 (95.8%)

[a]Number of patients with active lesions

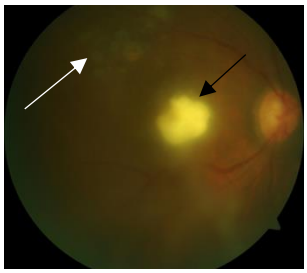
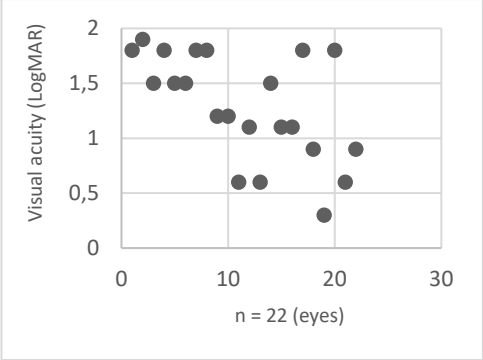
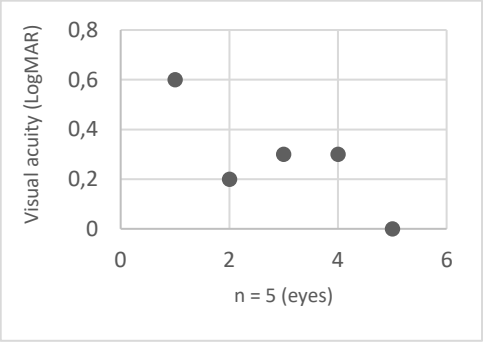


Figure 1. **Classic presentation of ocular toxoplasmosis in a 50-year-old female. Focal necrotizing retinitis on macular region (black arrow) was noted with adjacent chorioretinal scar (white arrow) and overlying vitritis, represented 'headlight in the fog' appearance.**

Patients with active lesions were divided into 2 categories, based on the location of lesion. We found 22 eyes with macular lesions and 5 eyes with extramacular lesions. Initial visual acuity (LogMar) for each groups were shown in figure 1.



(a)



(b)

Figure 2. **Initial visual acuity of patients with (a) macular lesion and (b) extramacular lesions.**

All patients with active lesion received medications. Besides one patient who received oral antibiotic only, all patients received oral antibiotic and steroid. Antibiotics was given either as single therapy or as combination with other antibiotics. Oral steroid was started 48-72 hours after antibiotics initiation at the dose of 0.5-1 mg/kgBW/day on tapered dose. The different regimens that had been given in this study were described in table 3.

Table 3. **Regimen of treatment**

Regimen	No. of pts
Trimethoprim-sulfametoxazole, steroid	10
Clindamycin, steroid	6
Spiramycin, steroid	5
Azithromycin, steroid	2
Clindamycin	1

Follow-up period ranged from 2 to 4 months, with mean 2.8 month. Seven patients were lost to follow-up. Resolution of lesions noted in 17 patients who received antibiotics and steroid.

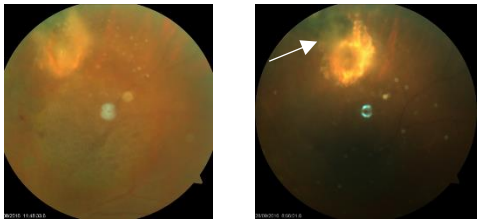
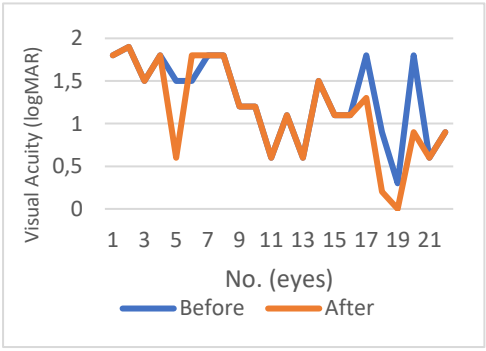


Figure 3. **Extramacular lesion in a 27-year-old female. Resolution was noted at 1-month follow-up (white arrow) after 3-weeks course of azithromycin along with steroid.**

Improvement of visual acuity were achieved in 5 patients with macular lesions (22.7%) compared to 2 patients with extramacular lesions (40%). Visual acuity at presentation and follow-up were shown in figure 4.



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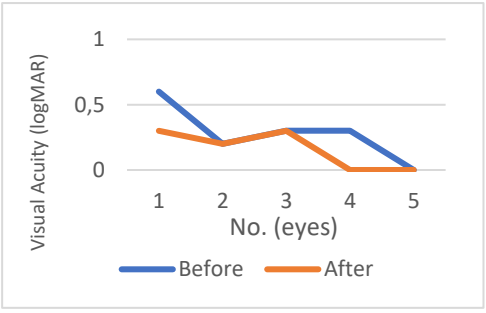

(b)

Figure 4. **Visual acuity improvement in patients with (a) macular lesion and (b) extramacular lesion.**

Three patients experienced complications at the final follow-up, 2 patients had choroidal neovascularization and 1 patient had retinal detachment.

DISCUSSION

The most common presenting symptom in our study was blurred vision (76.3%), similar with previous study done in Central Java.5 This result may due to macular involvement and/or dense vitritis. Most active lesions were unilateral, nonetheless 3 patients had bilateral presentation, that may suggest congenital infection. The unilateral case tends to occur more common in acquired infection, while bilateral central lesions with large atrophic scar are more frequent in congenital toxoplasmosis. But differentiating congenital and acquired ocular toxoplasmosis in adult is challenging, except there are proof of other signs of congenital infection.8,9 In our study, 21 eyes presented with retinochoroidal scar that inadvertently found during routine ophthalmoscopy examination.

Diagnosis of typical ocular toxoplasmosis is mainly based on clinical findings. There is no laboratory test that can differentiate the route of infection. Serological serum examination is useful to confirm the exposure. Negative titer may not exclude the diagnosis.1,3,7 All of our patients had increased serum IgG antitoxoplasma, and 3 patients had positive IgM antitoxoplasma. IgG titer may increase 2-3 weeks after acute infection, reaching the peak at 6-8 weeks and remain positive for long period. IgM antitoxoplasma reach the peak at first week of the onset of infection, and decreased 1 month after.1,6,9 All patients with ocular toxoplasmosis may have positive serum IgG antitoxoplasma, but so are all individuals with seroprevalence. Another laboratory tests, such as Goldmann-Witmer coefficient and polymerase chain reaction, are very useful to make diagnosis in atypical lesions.[10,11]

There are controversies regarding whether ocular toxoplasmosis should be treated, the duration of treatment, and what agent(s) should be used.12 There is lack of international guideline or consensus regarding the treatment regimen of ocular toxoplasmosis. The standard therapy has been "classic treatment" with triple drugs, sulfadiazine, pyrimethamine, and prednisone. Many comparative studies have been conducted to investigate different treatment regimens for ocular toxoplasmosis. A study involving 79 uveitis specialist responders represented 9 antibiotics used in 24 different regimens. A prospective clinical trial found no significant differences between classic treatment and trimethoprim-sulfamethoxazole. Trimethoprim-sulfamethoxazole is widely used as alternative treatment, due to low price, drug availability, and similar action as classic treatment. Trimethoprim-Sulfamethoxazole had also proven to be effective in reducing the recurrence rate of recurrent retinochoroiditis.[3,7,13,14]

Eventhough the use is still controversial, oral steroid may beneficial to limit the tissue destruction due to inflammation. However, the use of oral steroid without antibiotics coverage must be avoided, as that may cause further damage to retina. Oral steroid should be commenced 72 hours after initiating antibiotics.[3,7,13]

From 27 patients in our study who receiving treatments, 10 patients were lost to follow-up. The mean follow-up was 2.8 months. Clinical improvements that were evaluated included decreased level of vitritis, decreased size of retinal exudates, and cicatrization of active lesion. Resolution of lesions were achieved in all patients receiving treatments until the end of follow-up. In group of patients with active lesions, 5 out of 22 eyes experienced visual acuity improvements, and 1 eye had decreased visual acuity due to optic nerve involvement. Improvement of visual acuity were noted more in patients with extramacular lesion. This is consistent with the fact that macular lesion has poorer visual prognosis due to retinochoroidal scar formation as the final result.

Complications of retinal detachment and choroidal neovascularization may occur during resolution of lesion. Choroidal neovascularization may arise from the edge of the retinochoroidal scar. The most common retinal detachment is rhegmatogenous type, that may due to the traction of atrophic scar to the surrounding tissues.[3,7]

Our study has some limitations, due to the retrospective nature, limited time of data collections, and short period of follow-up. Further randomized clinical study that involving larger number of patients and longer follow-up period may provide bigger perspective of ocular toxoplasmosis in Indonesia.

CONCLUSION

Our study showed that ocular toxoplasmosis occurs more common in woman. Most patients presented with blurred vision. Unilateral typical lesion is the commonest cases. Trimethoprim-Sulfamethoxazole was most frequent antibiotics used in our study, either as single therapy or combination with other agent, and oral steroid used in coverage of antibiotics. Most of our patients show good responses to the treatment regimens.

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