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CLINICAL CHARACTERISTICS OF OCULAR TOXOPLASMOSIS PATIENTS

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ABSTRACT

Ocular toxoplasmosis is the main cause of posterior uveitis caused by infection of *Toxoplasma gondii* and can cause blindness. The diagnosis of ocular toxoplasmosis is based on typical clinical findings accompanied by positive anti-Toxoplasma serology. This study aimed to see the clinical characteristics of ocular toxoplasmosis patients at RSUP Dr. Mohammad Hoesin in 2019-2021. The research conducted is observational descriptive research with a cross-sectional design. This study used secondary data in the form of medical records of patients at RSUP Dr. Mohammad Hoesin Palembang in 2019-2021. The highest incidence of ocular toxoplasmosis at RSUP Dr. Mohammad Hoesin Palembang in 2019-2021 occurred in 2021 (54.5%). The most common age range found in this case is the age group of 0-19 years (45.5%), and the majority are women (72.7%). The majority of patients are out of work (45.5%) and live outside Palembang (81.8%). The most lateralization was found in the right eye (63.6%). The most commonly complained clinical symptom is blurred vision (90.9%). Clinical signs were found lesions of retinochoroiditis in the macular (45.5%), in the extramacular (18.2%), chorioretinal scar (90.9%), vitritis (54.5%), decreased visual acuity (100%), and increased IOP (36.4%). Anti-Toxoplasma IgG was found positive in all patients. The highest incidence of ocular toxoplasmosis was found in 2021. The most commonly complained clinical symptom is blurred vision, and the most common clinical sign is decreased visual acuity.

Keywords: Ocular toxoplasmosis, incidence, clinical characteristics.

АБСТРАКТ

Глазной токсоплазмоз является основной причиной заднего увеита, вызванного инфекцией *Toxoplasma gondii*, и может привести к слепоте. Диагноз глазного токсоплазмоза основывается на типичных клинических проявлениях, сопровождающихся положительной антитоксоплазменной серологией. Целью данного исследования является изучение клинических характеристик пациентов с глазным токсоплазмозом в РГУП им. доктора Мохаммада Хёсина в 2019-2021 гг. Проведенное исследование является обсервационным описательным исследованием с дизайном поперечного сечения. В данном исследовании использовались вторичные данные в виде медицинских карт пациентов в RSUP Dr. Mohammad Hoesin Palembang в 2019-2021 годах. Самая высокая заболеваемость глазным токсоплазмозом в RSUP Dr. Mohammad Hoesin Palembang в 2019-2021 годах наблюдалась в 2021 году (54,5%). Чаще всего встречается возрастная группа 0-19 лет (45,5%), большинство составляют женщины (72,7%). Большинство пациентов не работают (45,5%) и живут за пределами Палембанга (81,8%). Наибольшая латерализация была обнаружена в правом глазу (63,6%). Наиболее распространенным клиническим симптомом является затуманенное зрение (90,9%). Из клинических признаков были выявлены поражения ретинохороидита в макуле (45,5%), в экстремакуле (18,2%), хориоретинальный рубец (90,9%), витрит (54,5%), снижение остроты зрения (100%) и повышение ВГД (36,4%). Антитоксоплазменный IgG был выявлен положительным у всех пациентов. Наибольшая частота глазного токсоплазмоза была выявлена в 2021 году. Наиболее частым клиническим симптомом является затуманенное зрение, а наиболее частым клиническим признаком - снижение остроты зрения.

Ключевые слова: Глазной токсоплазмоз, заболеваемость, клинические характеристики

INTRODUCTION

Ocular toxoplasmosis (TO) or toxoplasma retinochoroiditis is the main cause of posterior uveitis due to infection in some regions of the world caused by the intracellular obligate parasite *Toxoplasma gondii* (*T. gondii*).^{1,2} Sources of infection in humans include oocysts present in the soil or airborne dust, undercooked meat that contains tissue cysts (encysted forms of parasites), and tachyzoites (proliferative forms) transmitted through the placenta.³

Ocular toxoplasmosis is a progressive, recurrent, and incurable disease that can cause blindness.⁴ Although there are no accurate figures for the prevalence of ocular toxoplasmosis in Indonesia, Indonesia is considered to have a high seroprevalence, with reports ranging from 43 to 88% in some regions.⁵

Patients with active toxoplasmosis can have symptoms in the form of blurred vision or the presence of floaters as a secondary result of vitritis, red eyes caused by inflammation of the anterior uvea in the form of iridocyclitis and, if severe, may be accompanied by pain and photophobia. The clinical sign that usually appears is in the form of an active retinochoroidal lesion that looks like a whitish or yellowish exudate involving the inner retina. Usually, the lesion appears adjacent to a pre-existing retinochoroidal scar but can also appear as an isolated focal lesion. Active lesions associated with more severe vitreous fog can usually display a "headlight-in-the-fog" aspect on fundus examination. Intraocular pressure increases in 10%-30% of these cases.⁶

The diagnosis of ocular toxoplasmosis is established on the basis of typical clinical findings, that is the area of active retinochoroiditis lesions adjacent to the old hyperpigmentation scar accompanied by vitreous inflammation.⁷ If an acute infection is suspected, the patient's serum should be tested for *T. gondii*-specific IgG and IgM antibodies.⁸

The classic regimen for the treatment of ocular toxoplasmosis consists of 4-8 weeks of pyrimethamine and sulfadiazine. Folinic acid is added to prevent myelosuppression that can occur as a result of pyrimethamine therapy. Routine blood tests can be performed approximately every two weeks during therapy. Clindamycin can be added to the above regimen or as a substitute for sulfadiazine in case of sulfa allergy.⁹ The prognosis of the disease is generally good if the macula and optic nerve are not involved, but when it affects the macula and optic nerve, it can lead to more severe outcomes such as blindness.¹⁰

Because data on the clinical characteristics of ocular toxoplasmosis is still rarely found in Indonesia. Therefore, researchers conducted research related to the clinical characteristics of ocular toxoplasmosis patients at RSUP Dr. Mohammad Hoesin Palembang in 2019-2021.

MATERIAL AND METHODS

The research conducted is observational descriptive research with a cross-sectional design. This study used secondary data in the form of patient medical records at RSUP Dr. Mohammad Hoesin Palembang in 2019-2021. The research was conducted from June to November 2022 at the medical record installation of RSUP Dr. Mohammad Hoesin Palembang.

The sample of this study was ocular toxoplasmosis patients at RSUP Dr. Mohammad Hoesin Palembang in 2019-2021, who were taken using *the total sampling* technique. Incomplete or damaged medical record data was not included in the study. After being collected, univariate analysis was carried out using IBM SPSS Statistics 26 (IBM, Armonk, United States). The results of the analysis are presented in the form of distribution tables and described in the form of narratives.

RESULT

From the results of the study, there were 11 medical records of ocular toxoplasmosis patients from January 1, 2019, to December 31, 2021, which were used as research samples. The incidence of ocular toxoplasmosis by year is presented in Table 1.

Ocular toxoplasmosis was most prevalent in 2021 (54.5%), followed by 2019 (36.4%), and the least discovered in 2020 (9.1%).

Table 1. Incidence Rate of Ocular Toxoplasmosis By Year

Year	n (%)
2019	4 (36,4)
2020	1 (9,1)
2021	6 (54,5)
Total	11 (100)

Demographic data of all patients are presented in Table 2. The age category most occurs in the age category 0-19 years (45.5 %), followed by the age of 20-39 years (36.4 %) and 40-59 years (18.2 %). By gender, the majority of patients were female (72.7%). Patients were out of work (45.5 %), followed by students (27.3 %),

farmers (9.1 %), drivers (9.1 %), and housewives (9.1 %). This data shows that the majority of research subjects, as many as 9 were outside Palembang (81.8%), and in Palembang, as many as two research subjects (18.2%). It was found that two patients consumed raw vegetables (18.2%).

Table 2. Demographic Data of Ocular Toxoplasmosis Patients

Variable	n (%)
Age	
0-19 years	5 (45,5)
20-39 years	4 (36,4)
40-59 years	2 (18,2)
Total	11 (100)
Gender	
Man	3 (27,3)
Woman	8 (72,7)
Total	11 (100)
Work	
Farmer	1 (9,1)
Students	3 (27,3)
Driver	1 (9,1)
Housewife	1 (9,1)
Not working	5 (45,5)
Total	11 (100)
Residence	
Palembang	2 (18,2)
Outside Palembang	9 (81,2)
Total	11 (100)
Food Consumption History	
Undercooked meat	0 (0)
Raw vegetables	2 (18,2)
Neither	9 (11)
Total	11 (100)

Data on the clinical characteristics of all patients are presented in Table 3. The majority of patients came with symptoms that occurred in the right eye (63.3%, seven patients), and four other patients showed symptoms on both sides of the eye, of which ten patients (90.9%) complained of blurred vision, followed by seeing flying objects or *floaters* (36.4%, four patients), pain (9.1%, one patient), and glare (9.1%, one patient).

A decrease in visual acuity (100%) is the most commonly found clinical sign of ocular toxoplasmosis. This is a little confusing considering that in this study, the most complained clinical symptom was a blurred vision which occurred in almost

the entire sample (90.9%). This difference in results may occur as a result of anamnesis of patients with ocular toxoplasmosis whose unilateral vision of the patient is helped by healthy eye vision so that the patient's vision still feels normal.

The chorioretinal scar was found in almost all patients (90.9%), found in six patients with vitritis (54.5%) when examined, and intraocular pressure (IOP) increased in 4 patients (36%). Lesions of retinokoroiditis were found in 7 patients (63.7%), and of these seven patients, there were five patients with macular involvement (45.5%) and two patients with lesions located in the extramacula (18.2%) that would eventually lead to scarring.

Table 3. Clinical characteristics of ocular toxoplasmosis patients

Variable	n (%)
Lateralisasi	
Oculi Dextra	7 (63,6)
Oculi Dextra Left	4 (36,4)
Clinical Symptoms	
Seeing flying objects	4 (36,4)
Blurred vision	10 (90,9)
Pain	1 (9,1)
Glare	1 (9,1)
Clinical Signs	
Retinokoroiditis lesions	7 (63,7)
Macula	5 (45,5)
Extramacula	2 (18,2)
<i>Chorioretinal scar</i>	10 (90,9)
Vitritis	6 (54,5)
Decrease in visual acuity	11 (100)
Increased IOP	4 (36,4)

Supporting examinations carried out in the form of serological examinations IgM and IgG anti-Toxoplasma are carried out to help diagnose ocular toxoplasmosis after the clinical picture. Only one patient (9.1%)

was positive for IgM, while all patients were positive for IgG (except for three missing data) (table 4).

Table 4. Supporting Examination Data for Ocular Toxoplasmosis Patients

Variable	n (%)
IgM anti-Toxoplasma	
Negative	7 (63,6)
Positive	1 (9,1)
Missing data	3 (27,3)
IgG anti-Toxoplasma	
Negative	0 (0)
Positive	8 (72,7)
Missing data	3 (27,3)

DISCUSSION

Ocular toxoplasmosis was most prevalent in 2021 (54.5%) and the least discovered in 2020 (9.1%). Previous research conducted by Retmanasari *et al.* showed that seroprevalence is relatively high, ranging from 43-88% in several regions in Indonesia.⁵

Most of the age category in this study was 0-19 years old. Other studies say that the most affected age category is the 21-50 age.¹¹ This difference in results is because the data obtained in this study is limited, and the number is quite small, so the age variations obtained are also not diverse. However, this condition is very likely to occur because toxoplasmosis infection can occur in individuals of a younger age.¹¹

This study showed that more female populations experienced ocular toxoplasmosis. This is in line with research conducted by Sofia *et al.*, which shows that most ocular toxoplasmosis patients are women.¹² Women more often perform activities that gain exposure to the causative agent of ocular toxoplasmosis, for example, activities involving domestic animals such as cats, processing of poultry animals, and foodstuffs that may be contaminated with *T. gondii* when compared to men who generally work in construction and business.^{11,13}

The most complained symptom in this study was blurred vision (90.9%). This result is in line with previous research conducted in Malang.¹² Visual impairment in the form of blurred eyes and seeing flying objects can be caused by vitritis, while pain and glare occur in severe cases of ocular toxoplasmosis.⁶

The most commonly found clinical sign is a decrease in visual acuity. The clinical signs that appear are due to the dormant characteristics of the cyst, which remains on the retina or nearby tissues' scar. The rupture of the cyst will release bradyzoite into the surrounding tissue, thus triggering an immune response, such as vitritis and retinitis. The combination of lesions and vitritis gives the image of a characteristic "headlight in the fog," pathognomonic ocular toxoplasmosis. It is this situation that can lead to a decrease in visual acuity in the patient.¹¹

This study found that the positive Toxoplasma IgM had only one subject (9.1%), while all subjects had a positive Toxoplasma IgG except for three non-existent data. This is also in line with other studies conducted by Sofia and Hariyono in 2019 found that positive anti-Toxoplasma IgM had only 3 subjects (7.9%), while all subjects had positive anti-Toxoplasma IgG except for 1 data that did not exist.¹² IgG titers in patients usually increase 2-3 weeks after acute infection, peak at 6-8 weeks, and remain positive over time. An increase in IgG in patients indicates that the infection has passed the acute period. In contrast, anti-Toxoplasma IgM peaks in the first week after infection and decreases one month after. This means that in this study, one patient was found who had an acute infection, and seven patients had a recurrent infection or had passed the acute infection period.^{12,14,15}

CONCLUSION

The incidence of ocular toxoplasmosis was found to be the most in 2021. Ocular toxoplasmosis is more commonly found unilaterally in the right eye. The symptom that patients most often complain about is blurred vision. A clinical sign in the form of a decrease in visual acuity occurs in all patients.

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DECLARATIONS

No conflict of interest was declared by the authors.

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