Sriwijaya Journal of Ophthalmology
Journal Homepage: https://sriwijayaopthalmology.com/index.php/sjo

Evaluation of Chronic Central Serous Chorioretinopathy Treatment at Dr. Cipto Mangunkusumo National General Hospital, Jakarta, Indonesia

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ARTICLE INFO

Keywords:
Anti-inflammatory drugs
Chorioretinopathy
Fundus
Hypertension
Visual acuity

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All authors have reviewed and approved the final version of the manuscript.

https://doi.org/10.37275/sjo.v6i1.105

A B S T R A C T

Introduction: Central serous chorioretinopathy (CSC) is a condition characterized by the accumulation of transparent fluid in the posterior pole of the fundus. Currently, there are several therapeutic options that can be used to treat chronic CSC. This study aimed to describe the clinical characteristics and results of the management of chronic CSC. **Methods:** The design of this study was a descriptive study. This research was conducted at the division of vitreoretina, department of ophthalmology, Faculty of Medicine, Universitas Indonesia, Dr. Cipto Mangunkusumo National General Hospital (RSCM), Jakarta, Indonesia, from April to June 2022. The inclusion criteria were newly diagnosed patients with chronic CSC in the specified period. Data analysis in this study was carried out using descriptive statistics. Snellen vision in patients is converted into logMar vision with the formula-log (decimal vision). **Results:** There were 17 patients who were included in this study. Among them, 76.4% were men, 52.94% were in the left eye, and there were risk factors for hypertension, as much as 29.41%. Five patients received non-steroidal anti-inflammatory drugs (NSAID) therapy, with 2 of them experiencing increased visual acuity and 3 of them complete resolution. Five patients received anti-VEGF therapy, with 3 of them experiencing increased visual acuity and also complete resolution. Seven patients received subthreshold laser therapy, with all experiencing increased visual acuity, and 4 of them complete resolution. There were 15 patients with subretinal fluid and 2 patients with subretinal fluid combined with retinal pigment epithelial detachment. **Conclusion:** Most of the patients were male, with an average age of 45.8 years. Most CSC patients affect one eye and still have fairly good vision. The treatments received by patients consisted of non-steroidal anti-inflammatory drugs (NSAID) therapy, anti-VEGF therapy, and subthreshold laser therapy.

1. Introduction

Central serous chorioretinopathy (CSC) is a condition characterized by the accumulation of transparent fluid in the posterior pole of the fundus.[1] This disorder is one of the macular abnormalities that are often encountered in daily practice.[2] Tsai et al. reported that the incidence of idiopathic CSC in Taiwan is 0.2% per year, and the number is relatively stable every year.[3] The pathophysiological mechanism of this disorder is still not known with certainty and continues to develop in accordance with the development of existing imaging examination methods. It is suspected that impaired barrier and pump function in the retinal epithelial pigment layer has a role in the mechanism of fluid accumulation in the sub-retina.[4] The current theory states that there is a role for blood vessels in the choroid in the pathophysiological mechanism of CSC.

Hyperpermeability of the choroidal vessels causes an increase in hydrostatic pressure and interference with the function of the RPE pump, which causes the release of the retinal pigment epithelium and causes disruption of the retinal blood barrier, and this causes accumulation of fluid between the retinal layer and the retinal pigment epithelium layer.[1]

Currently, there are several therapeutic options that can be used to treat chronic CSC.[5] Laser photocoagulation performed on the leaky area is the most frequently performed therapy. This therapy is expected to patch the leak that occurs in the retinal pigment epithelium layer, which can be seen through the FFA. The expected additional effect of the laser is the repair of the retinal epithelial pigment pump nearby with the stimulation provided by the laser. However, this therapy should be considered with caution if the leak is close to the macular area. Subtreshold retinal laser (SRL) is a laser therapy that uses a diode laser with a wavelength of 810 nm, which was developed with a smaller laser power. This therapy aims to prevent the occurrence of side effects caused by conventional laser therapy, such as the emergence of choroidal neovascularization, scar tissue formation, and scotoma. Photodynamic therapy (PDT) using verteporfin using angiography indocyanine as a target. It is suspected that PDT can affect the structure of the choroidal vessels, perfusion, and reduce choroidal permeability. This mechanism is expected to reduce or eliminate the subretinal fluid that occurs, which causes CSC. However, diffuse PDT application can cause side effects such as choroidal pigmentation, retinal pigment layer atrophy, choriocapillary non-perfusion, and the possibility of choroidal neovascularization. The administration of anti-vascular endothelial growth factor (anti-VEGF) in CSC patients is based on the possibility of the VEGF effect, which increases choroidal permeability. Several small retrospective studies have shown that anti-VGF administration in chronic and recurrent CSC patients has shown a decrease in central retinal thickness associated with an increase in visual acuity.[6,7] Anti-VEGF administration has been enforced in chronic CSC patients accompanied by the presence of choroidal neovascular membranes. This study aimed to describe the clinical characteristics and results of the management of chronic CSC.

2. Methods

The design of this study was a descriptive study. This research was conducted at the division of vitreoretina, department of ophthalmology, Faculty of Medicine, Universitas Indonesia, Dr. Cipto Mangunkusumo National General Hospital (RSCM), Jakarta, Indonesia, from April to June 2022. The population of this study was all patients with a diagnosis of chronic CSC in the period January 1st, 2020, to December 31st, 2021. The subjects of this study were reachable populations who met the inclusion criteria. The inclusion criteria were newly diagnosed patients with chronic CSC in the specified period. Exclusion criteria for this study included patients with incomplete or missing medical records, patients with a history of panuveitis, refractive media opacities, and pediatric patients under 17 years old. This research has received ethical approval from the research ethics committee of the Faculty of Medicine, Universitas Indonesia-RSCM (KET-645/UN2.F1/ETIK/PPM.00.02/2022).

Data collection in this study was carried out by tracing patient registers at the vitreoretinal polyclinic with a diagnosis of chronic CSC from January 1st, 2020, to December 31st, 2021, evaluation of periodic monitoring of patient management was followed and recorded up to 2 months after diagnosis, and all research variables were listed in the master table processed and presented in a research report. Data analysis in this study was carried out using descriptive statistics. Categorical data are presented in amounts and percentages. Snellen vision in patients is converted into logMar vision with the formula-log (decimal vision).

3. Results

A total of 17 patients participated in this study. In this study, it was found that the age of the patients was 30-64 years. Most of the patients were male (Table

1). There was 1 patient who had bilateral CSC. The onset of symptoms was 3 months to 5 years, and all patients had never had cataract surgery. Five patients have central scotoma as their chief complaint, 5 patients have metamorphopsia, and the rests have sudden blurring. Most of the patients could not identify their risk factors (Table 2).

Table 1. Demographic characteristics of patients.

Demographic parameter	Total patients (n=17)
Mean age	45,8 (36-60)
Gender	
Male	13 (76.4%)
Female	4 (23.5%)
Laterality	
Right eye	7 (41.17%)
Left eye	9 (52.94%)
Bilateral	1 (5,88%)
Systemic risk factor	
Hypertension	5 (29.41%)
Steroid drugs	2 (11.76%)
Gastritis	1 (5.88%)
N/A	9 (52.94%)

Table 2. Clinical characteristics of chronic CSC patients.

Characteristics	Eyes total (n=17)
Main complaint	
Central scotoma	5(29,41%)
Metamorphopsia	5(29,41%)
Sudden blur	7(41,17%)
BCVA (logMar)	
0-1,00	16 (94,1%)
>1,00	1(5,9%)
Lens status	
Phakic	17 (100%)
Pseudophakic	0
Complaint characteristics	
Repeated	4(23,52%)
First time	13(76,47%)

Based on disease treatment, 7 patients received focal laser therapy, 5 patients received anti-VEGF injections, 5 patients received oral medication with NSAID eye drops. Furthermore, an analysis of the type of patient management was carried out on visual acuity and resolution. Tables 3 and 4 show visual acuity and subretinal fluid resolution based on the type of patient treatment. Table 5 shows visual acuity based on clinical conditions. Subretinal fluid and retinal pigment epithelial detachment are presented in Figure 1.

Table 3. Visual acuity based on treatment.

Treatments	Visual acuity		
	Increase	Stable	Decrease
NSAID	2	3	0
Anti-VEGF injection	3	2	0
Subthreshold laser	7	0	0

Table 4. Subretinal fluid resolution based on treatment.

Treatment type	Complete resolution	Incomplete resolution
NSAID	3	2
Anti-VEGF injection	3	2
Subthreshold laser	4	3

Table 5. Visual acuity based on the clinical condition.

Condition	Visual acuity		
	Increase	Stable	Decrease
Subretinal fluid	13	2	0
Subretinal fluid and retinal pigment epithelium detachment	2	0	0

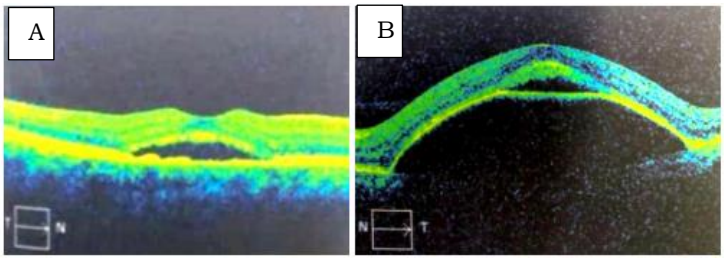

Figure 1. (A) There was subretinal fluid under neurosensory retinal detachment in the macular area; (B) There were shallow subretinal fluid and retinal pigment epithelium detachment under the macular area.

4. Discussion

Based on study results, it was found that men suffer from this disorder more often than women. A previous study stated that men are six times more likely to suffer from CSC than women.[8] Another study found male gender is an independent factor in the occurrence of CSC.[9] In general, the incidence of CSC affects unilaterally but can also occur bilaterally. This is in accordance with the results of another study. A previous study found that unilateral CSC abnormalities were as much as 93% and bilateral as many as 4-6%.[10]

In this study, as many as fifteen patients were exposed to this disorder for the first time, and two patients experienced recurrent events. This is consistent with a study conducted by Yu et al., which stated that men and old age are independent factors in the occurrence of recurrence and persistence of CSC cases in the Chinese population.[11]

Hypertension is suspected as a risk factor for the occurrence of CSC, which is still controversial. Various studies have provided different results. From the data of this study, it was known that 29.4% of patients had hypertension. Similar results were found in hypertension as a risk factor in male CSC patients aged 35-50 years.[3,12] The mechanism for the occurrence of CSC with steroid levels is still a hypothesis that states that high levels of steroids will affect the choroidal blood vessels causing increased hyperpermeability and decompensation of the choroidal circulation, disruption of Bruch's membrane and retinal pigment layer. Steroids can also induce platelet aggregation and vasoconstriction by suppressing vasodilators such as nitric oxide and prostaglandins.[13]

The administration of topical NSAIDs to CSC patients is based on an opinion that states the possible involvement of prostaglandins in the mechanism of CSC occurrence, which is supported by the results of previous studies. A study found no significant difference in the vision of patients who were given topical NSAIDs but provided more anatomical changes

in the retinal layer with a reduction in SRF and a faster reduction in SRF.[12,13] The effects of oral and topical NSAIDs vary greatly depending on the health condition of the retinal pigment epithelium layer.

5. Conclusion

Most of the patients were male, with an average age of 45.8 years. Most CSC patients affect one eye and still have fairly good vision. The treatments received by patients consisted of non-steroidal anti-inflammatory drugs (NSAID) therapy, anti-VEGF therapy, and subthreshold laser therapy.

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