***Original Article***

# Prevalence and Profile of Central Serous Chorioretinopathy in an Indian Cohort

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## Abstract

**Aims**: To determine the profile of CSCR patients from a tertiary health care set-up in India.

**Methods and Material:** A total of 2780 (2447 males and 333 females) patients with a diagnosis of CSCR were included. Data regarding the demographics, profile of CSCR and systemic diseases, if any, were collected from a tertiary eye care network in South India from January 2012 to December 2016.

**Results:** The prevalence of CSCR was found to be 1.7% (A total 2780 patients, with mean age of 42.3±10.1 years). A total of 2031 patients had a unilateral and 749 had bilateral involvement. Acute and chronic CSCR was seen in 1932 (69.5%) and 848 (30.5%) eyes respectively. The mean uncorrected visual acuity of the patients was 0.51±0.45 logMAR (Snellen equivalent 20/60) while the mean best corrected visual acuity was 0.32±0.40 logMAR (Snellen equivalent 20/40). History of smoking and steroid use was present in 214 (7.7%) and 758 (27.3%) individuals respectively. Hypertension and diabetes mellitus was present in 106 (3.8%) and 51 (1.8%) patients respectively. Most of patients {824 (29.6%) patients} were shift-workers. Laser was done in 336 (12.1%) acute and 223 (8%) chronic CSCR patients. Photodynamic therapy was used in 12 acute and 12 chronic cases.

**Conclusion:** Prevalence of CSCR was 1.7%. The study provides an overview of patient profile among Indian subjects.

**Key words:** Central serous chorioretinopathy; CSCR; clinical profile; India

## Introduction

Central serous chorioretinopathy (CSCR) is characterized by neurosensory detachment, with or without detachment of retinal pigment epithelium (RPE) at the posterior pole. There's limited data regarding the incidence of CSCR. A population-based study, conducted in Olmsted County, Minnesota, provides an estimate of around 5.8 per 100,000.(Kitzmann et al., 2008) A similar study from Taiwan reported an annual incidence of around 0.21%.(Tsai et al., 2013) However, there is paucity of data from the Indian sub-continent.(Kitzmann et al., 2008) Also, the preferred practice patterns for CSCR differ from country to country.(Mehta et al., 2017) In this study, we aim to describe the

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clinical profile of CSCR from a tertiary health care centre in India.

## Subjects and Methods

Records of all the patients seen at retina clinic were reviewed retrospectively from electronic medical record database from four campuses of a tertiary eye care network in South India from January 2012 to December 2016. Electronic medical records (EMR) database was screened for patients having a clinical diagnosis of CSCR or Central Serous Chorioretinopathy documented in their records. In an attempt to capture all probable cases of misdiagnosed CSCR, search keywords also included terms such as pigment epithelial detachment, Vogt Koyanagi Harada disease. These files were again screened for a correct final diagnosis of CSCR and included in study sample.

### Definitions

- Acute CSCR was defined as the presence of neurosensory retinal detachment involving the posterior pole associated with a focal leak or leaks confirmed by fundus fluorescein angiography (FFA) after ruling out other causes of exudation presenting within 4 months of onset of symptoms.
- Chronic CSCR or diffuse retinal epitheliopathy was defined as widespread RPE decompensation with or without neurosensory retinal detachment; or active leakage sites presenting with symptoms lasting for 4 months or more.

Detailed personal information of each patient was recorded such as age, gender, occupation, duration of symptoms, smoking, steroid use, and history of any ocular disease or systemic illness. The definition of shift workers were individuals whose working hours fell outside the standard daylight hours (07:00- 18:00/19:00), including evening, night, morning, rotating and irregular shifts.(Bousquet et al., 2016) All patients underwent comprehensive eye examination like FFA, Optical coherence tomography (OCT) as per physician's discretion. Only baseline data was used for all the patients.

### Statistical analysis

Statistical analysis and graphs were prepared using Excel (version 2016, Microsoft, Corp. Redmond, WA).

## Results

Out of a total of 161931 patients that visited the retina services of a tertiary eye care network in South India between January 2012 to December 2016, 3271 records were found having the clinical diagnosis of CSCR. Out of the 3271 records, 491 records were excluded due to lack of documentation of visual acuity/ misdiagnosis. The remaining 2780 (1.7%) patients were included for the study.

### Patient profile

Out of the 2780 patients, 2447 (88%) were males while the remaining 333 (12%) were females. The mean age of the patients was 42.3±10.1 years (ranging from 15-85 years). The age-wise distribution of patients is shown in Figure.1. The most common age group to be affected was 35-45 years for both males and females.

### Disease profile

Out of 2780, 2031 (73.1%) patients had a unilateral involvement, while 749 (26.9%) had bilateral involvement. 1932 (69.5%) eyes had acute whereas 848 (30.5%) eyes had a chronic from of CSCR. Males dominated with both acute and chronic forms of CSCR, with 1685 (60.6%) and 762 (27.4%) eyes respectively. The mean duration of symptoms was 4±4.7 months (Median= 0.7 months). A summary of the patient profile is shown in Figure 1.

The mean uncorrected visual acuity of the patients was 0.51±0.45 logMAR (Snellen equivalent 20/60) while the mean best corrected visual acuity (BCVA) was 0.32±0.40 logMAR (Snellen equivalent 20/40). Mean BCVA in

patients with acute CSCR was 0.30±0.37 logMAR (Snellen equivalent 20/40) whereas those with chronic presentation had a BCVA of 0.40±0.46 logMAR (Snellen equivalent 20/50).

### Smoking, Steroid use, Systemic diseases

A total of 214 patients had a history of smoking (170 acute/ 44 chronic) while 59 others had an addiction to one or more of tobacco products. History of steroid use was seen in 758 (27.3%) individuals, among which 573 (75.6%) were acute while the remaining 175 (23.1%) patients were chronic. Systemic hypertension was present in 106 patients and 51 patients had a history of diabetes mellitus, and were on medications.

### Occupation

The occupation having the most number of cases of CSCR was shift workers, with 824 (29.6%) eyes (556 eyes had acute while the remaining 268 presented with chronic). This was followed by patients who were manual labourers (696 eyes (25%)) and office workers (573 eyes (20.6%)).

### Treatment

A total of 336 (247 (73.5%) conventional and 89 (26.5%) micropulse) cases of acute CSCR and 223 [179 (80.3%) conventional and 44 micropulse (19.7%)] chronic CSCR patients were treated with laser. PDT was used in 12 acute and 12 chronic cases.

Chart 1: Age wise distribution of patients

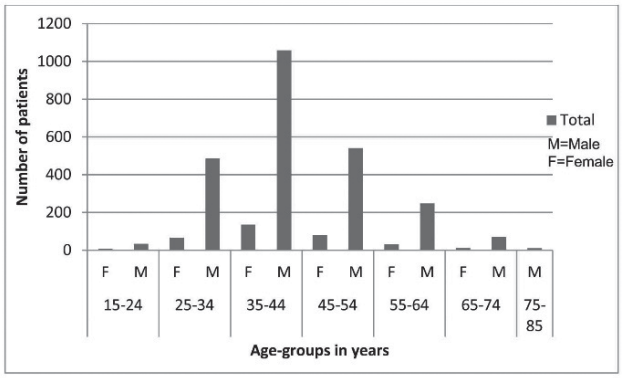


Chart 2: Gender wise distribution of patients

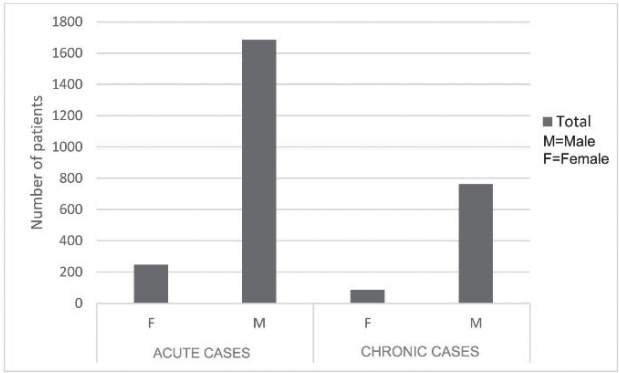


Chart 3: Occupation-wise distribution of patients

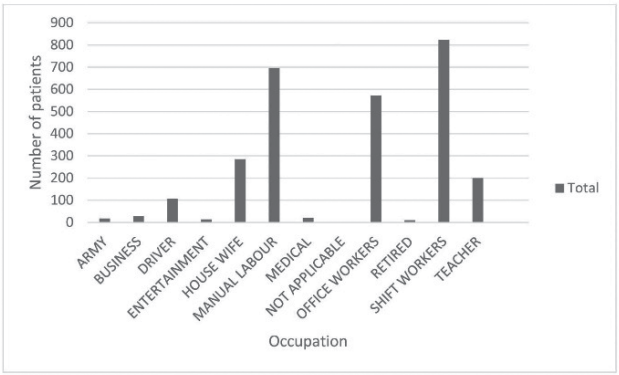


Chart 4: Mean age of patients

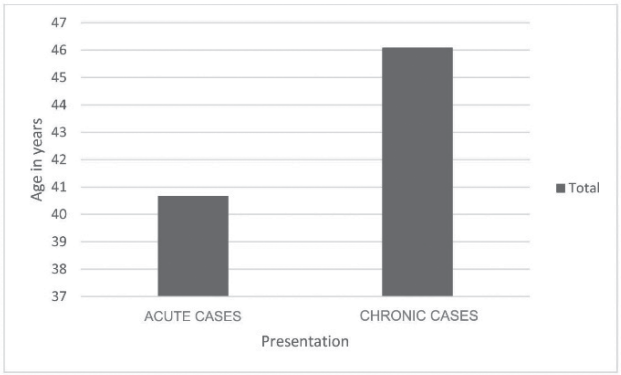


**Figure 1:** Summary of patient profile among acute and chronic central serous chorio-retinopathy groups.

## Discussion

CSCR typically affects the young active age group. Although most cases resolve by itself with minimal loss in visual function, around 5% of individuals can develop persistent defects in quality of vision.(Gass, 1997) The decrease in quality of vision can not only impair the quality of life but also have a huge psychological impact in these patients.(Şahin et al., 2014) Thus it becomes important to identify the disease burden in the community. Furthermore, there is paucity of data about the profile of the disease in the Indian sub-continent. In this study, we analysed the profile of patients presenting with CSCR from a tertiary health care centre. To the best of our knowledge, this is the first hospital-based analysis from Indian subjects evaluating the prevalence and profile of patients with CSCR.

During the four years of duration, prevalence of CSCR in our study was 1.7% among other retinal diseases. The value was found to be higher than similar previous studies.(Tsai et al., 2013, Kitzmann et al., 2008) The higher prevalence seen in our study could be due to the inclusion of both new as well as referred cases that visited the tertiary eye care centre. Also, the study was based on an urban population where the number of patients seeking medical attention is higher. While the disease has been described to occur in any age group, the most common age is around 35-39 years.(Tsai et al., 2013) In our study, we noticed similar results with the most common age group to be affected being 35-45 years and a mean of 42.3±10.1 years. We did not find any significant increase in incidence among females of higher age group as reported by previous studies.(Perkins et al., 2002, Kitzmann et al., 2008) The incidence of the disease was significantly greater in males (88%) than females (12%), with a ratio of 7.3:1. The values were slightly higher than that of a previous study by Kitzmann et al., where they found a six times higher risk in males. (Kitzmann et al., 2008)

In our study, the mean duration of symptoms was found to be 4±4.7 months with a median of 0.7 months. The duration of symptoms plays a major role in prognosticating the disease and in determining the final visual acuity. A longer duration of the disease is associated with a poorer outcome due to various structural changes like RPE and foveal atrophy or cystoid macular degeneration.(Yannuzzi et al., 1984, Iida et al., 2003, Piccolino et al., 2008, Kim and Flaxel, 2011) A total of 1932 (69.5%) eyes had acute whereas 848 (30.5%) eyes had chronic CSCR. Males were affected more commonly in both acute and chronic CSCR, with 1685 (60.6%) and 762 (27.4%) eyes respectively. As our study aimed to report the prevalence and profile, we are unable to comment on the outcome of our study subjects.

Various studies have shown the importance of life-style and occupation in the pathogenesis of CSCR.(Bousquet et al., 2016, Yannuzzi, 2012, Conrad et al., 2000) We divided the patients into different working groups to analyse the effect of occupation on the disease. We found an increased incidence of CSCR in patients having shift work (29.6% of patients), although lesser than a previous study (42.5%),(Bousquet et al., 2016) This was followed by manual laborers, constituting 25% of patients. Also, the proportion of acute cases was significantly higher than the chronic cases in all occupation groups. The occurrence of CSCR in these occupation groups is related to the associated stress and alteration in the circadian rhythm. Disturbance in this mechanism has been shown to affect the hypothalamic-pituitary axis and autonomic sympatho-adrenal system, thereby altering the secretion of cortisol and catecholamines hormones.(Meerlo et al., 2008)

Although CSCR most commonly manifests unilaterally, it is a bilateral disease. The fellow eye has been seen to be involved either

simultaneously or may follow the involvement of the primary eye.(Kitzmann et al., 2008) Angiographic evidence of an old episode of CSCR has also been seen in the fellow eye in as many as 32% of patients.(Bujarborua et al., 2005) In our study, a total of 2031 (73.1%) patients had a unilateral involvement, while 749 (26.9%) had bilateral involvement. This trend follows closely to that seen in several previous studies.(Gäckle et al., 1998, Kitzmann et al., 2008)

Cigarette Smoking has been known to contribute to the development of CSCR by affecting the choriocapillary blood flow.(Haimovici et al., 2004, Scheider et al., 1993, Ross et al., 2011) It is implicated not only in the pathogenesis of CSCR but also associate with a poor visual outcome following treatment.(Türkcü et al., 2014) We found a total of 214 (7.7%) patients with a positive history of smoking.

The role of steroids in the pathogenesis of CSCR is still unclear. However, it is believed to be due to increase in the cAMP in RPE cells and changing the pump function or disruption of the outer blood retinal barrier.(Zamir, 1997) In our study, 758 patients had a history of some form of steroid use. Among these patients, a total of 573 eyes were acute while the remaining 185 were chronic.

There are several limitations to the study. The study population comprised of only those who visited a tertiary health care centre and thus cannot be representative of the whole population. The retrospective and cross-sectional nature is another limitation. As FFA was not available for all patients, the cases taken in our study could not be confirmed to be CSCR. Therefore, some masquerades of CSCR may have been included in the study population. Lastly, the study was EMR based and could have had bias related to big data due to wrong entries.

In conclusion, this is the first hospital-based study, which reports prevalence and profile of CSCR in Indian population. This data could be useful for further studies and establishing the management strategy in Indian population.

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