

Angiographic Characteristics of Acute Central Serous Chorioretinopathy in an Asian Population

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Abstract

Introduction: Acute central serous chorioretinopathy (CSCR) afflicts young middle-aged males in the Western population. We aimed to analyse patient demographics and to determine the angiographic characteristics of acute CSCR in an Asian population. **Materials and Methods:** This is a retrospective study of all patients presenting with acute CSCR who had fundal fluorescein angiograms performed within a 4-year period (between 1 January 1998 and 31 December 2001). **Results:** The fluorescein angiograms of 128 patients were analysed. The majority were male (109/128) with a male-to-female ratio of 5.7:1. The age range of patients was 26 to 60 years, with a mean age of 41 years. The majority of patients (84%) were aged 30 to 50 years. With regard to racial distribution, 83% were Chinese, 6% were Malays and 11% were Indians or of other races. Unilateral disease was found in 74 patients (58%) and 52 had bilateral disease. The macula was the most common site of fluorescein leakage and was found in 97 patients (76%). Almost half the patients (44%) had more than one site of disease involvement (i.e., multifocal). The inkblot leakage pattern was found in 103 patients (80%). **Conclusions:** The patient demographics of acute CSCR in our population were compared to that reported in the West. The gender ratio was similar, with males being afflicted 6 to 10 times more compared to females. There was no racial predilection found for acute CSCR in the local population. We also found a significant proportion of patients with bilateral and multifocal disease compared to the West. The inkblot pattern of leakage was the most common pattern seen on angiography. There were a significant number of cases with bilateral and multifocal involvement, exceeding those reported in non-Asian populations.

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Introduction

Acute central serous chorioretinopathy (CSCR) is a condition of unknown origin characterised by a serous detachment of the macula. It afflicts young healthy adults, mostly men, between the ages of 20 and 50 years.¹ It is usually unilateral and patients present with the complaints of metamorphopsia, blurring of vision, relative scotoma and colour desaturation.² CSCR has also been documented to be associated with Type A personalities, corticosteroid use and hypertension among other systemic conditions.³⁻⁵ It is postulated to occur secondary to a leak from the choriocapillaris through the retinal pigment epithelium (RPE).⁶ A recent study of choroidal perfusion suggests that choroidal ischaemia might play a role in its pathogenesis.⁷

Fundal fluorescein angiography (FFA) of acute CSCR typically shows focal leaks at the level of the RPE in 2 main

patterns: “smokestack” (Fig. 1a) or “inkblot” (Fig. 1b).⁸ RPE dysfunction is also often demonstrable on FFA and indocyanine green (ICG) angiography.⁸⁻¹¹

The objectives of this study were to analyse patient demographics and to determine the angiographic characteristics of acute CSCR in a Singaporean population.

Materials and Methods

Acute CSCR is angiographically defined as the presence of inkblot and/or smokestack leakage pattern. A smokestack leakage is the leakage of fluorescein that spreads vertically in a linear configuration evocative of a plume of smoke as the angiogram progresses. An inkblot leakage refers to a small focal hyperfluorescent leak that appears early and increases in size and intensity as the angiogram progresses. “Unifocal” is used to describe a solitary site of either

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inkblot or smokestack leakage with the absence of RPE disturbances, as compared to “multifocal”, which is used when there is more than one site of leakage, and/or if there is RPE dysfunction or atrophy (Fig. 1c). This was determined by the presence of focal granular hyperfluorescence indicating window defects.

The site of leakage was classified into 3 groups, namely, the macula, the peripapillary and the periphery. The macula was defined as the region bounded by the temporal vascular arcades, whereas the peripapillary was the area within 1 disc diameter of the optic nerve, excluding the macula region, and the periphery was the area outside the macula and peripapillary region.

A series of all patients presenting with acute CSCR to the Singapore National Eye Centre who had FFA performed within a 4-year period (between 1 January 1998 and 31 December 2001) was retrospectively studied. The angiograms were retrieved from the digital database. All angiograms were digitally acquired using the Topcon Imagenet® system (TRC EX50IA). The site of leakage was documented as either in the macula, the peripapillary or in the periphery. FFA of the fellow eye was analysed to determine if there was bilateral disease involvement. Patients who had other ocular or macular conditions were excluded. Only patients who met the definition criteria of CSCR were included.

Results

In this 4-year period, 128 patients satisfied the selection criteria. Their FFAs were analysed. The majority were male (109/128) with a male-to-female ratio of 6:1. The age range of patients was 26 to 60 years, with the majority of patients (84%) aged between 30 and 50 years. The racial group of the patients were determined according to that stated in their identity cards. With regard to racial

distribution, 83% were Chinese, 6% were Malays and 11% were Indians or of other races. This is similar to the racial distribution of the Singaporean population. There was angiographic evidence of bilateral disease in 42% (54/128). The macula was the most common site of fluorescein leakage and was found in 97 patients (76%) (Fig. 2). Almost half the patients (44%) had more than one site of disease involvement (i.e., multifocal) (Fig. 3). Three types of angiographic patterns were seen in the patients. The inkblot leakage pattern was most common, and was found in 103 patients (80%), followed by the smokestack pattern of leakage, which was found in 20 patients (16%). There were 4 patients with both patterns of leakage seen (Fig. 4).

Discussion

The patient demographics of acute CSCR in our population were compared to that reported in the West. The gender ratio was similar, with males being afflicted 6 to 10 times more compared to females. The population affected here seemed younger as compared to a similar study done by Spaide et al.¹² The mean age of the patients in that study

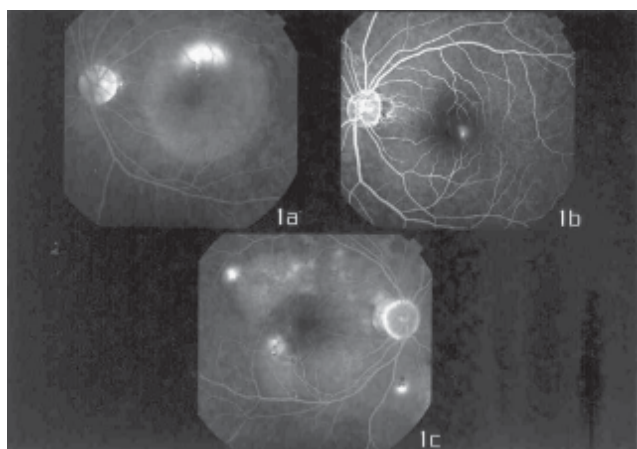


Fig. 1a. Smokestack leakage of fluorescein.
 Fig. 1b. Inkblot leakage of fluorescein.
 Fig. 1c. Multifocal central serous chorioretinopathy.

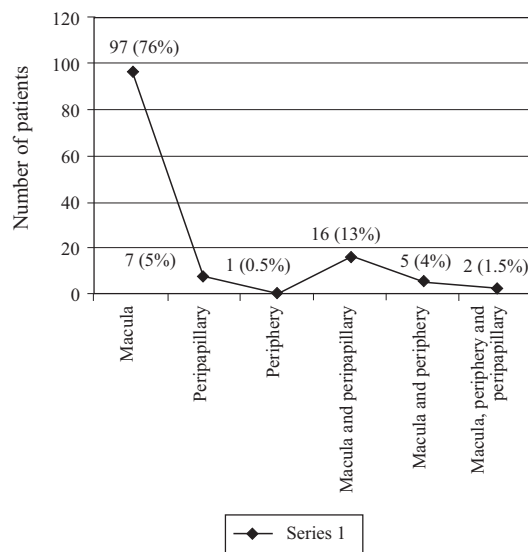


Fig. 2. Location of leakage points.

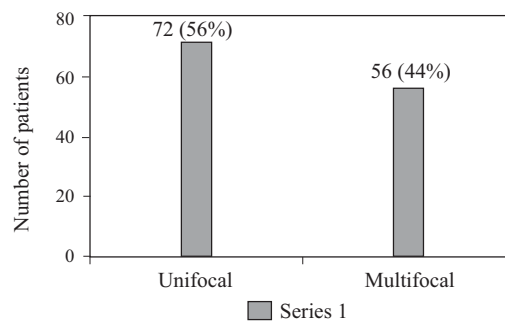


Fig. 3. Unifocal versus multifocal pattern of leakage.

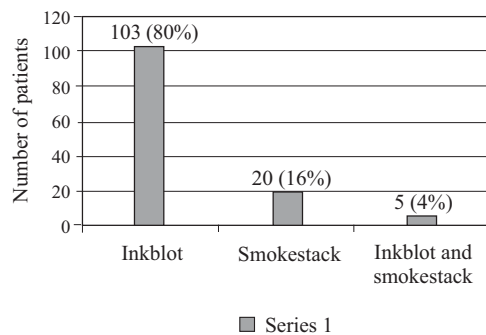


Fig. 4. Comparison of angiographic patterns of leakage.

was 51 years, compared to the mean of 41 years in this series. Their series included patients with chronic CSCR, while our series only looked at patients with at least an acute presentation of CSCR. The former tends to affect patients in an older age group, and the extent of retinal pigment epithelial disturbance is usually much more extensive, rather than focal.

Racially, there was no indication of a predilection for any particular ethnic group. The inkblot pattern of leakage was by far the most common leakage pattern seen on angiography. This was comparable to the findings by Mutlak et al.¹³ There were a significant number of cases with bilateral and multifocal involvement, exceeding those reported in non-Asian populations.¹²⁻¹⁶

Our series did not analyse ICG angiographic features of CSCR as ICG angiography was not available until the latter half of the study. Recent observations on ICG angiography have increased our knowledge and improved our understanding of the pathogenic mechanisms behind CSCR.⁶⁻⁸ It is known that the leakage seen on FFA is secondary to accumulation of fluid in the choroid from choroidal hyperpermeability, resulting in a breakdown in the retinal pigment epithelial pump. This causes a slow leak of fluid from the blood-retina barrier, resulting in the smokestack and inkblot leakage patterns seen on FFA.

There is evidence that the rates of CSCR are comparable in African-Americans and Caucasians.¹⁷ While we have demonstrated that there is a concordance of angiographic characteristics of acute CSCR with those reported in the West, we have a significant proportion of patients with bilateral and multifocal disease (44% vs 23% to 30%).¹³ We speculate that this difference may relate to different susceptibilities of Asians to CSCR, or perhaps reflect different underlying pathogenic mechanisms at play. Further studies would need to be carried out for the reasons behind this, such as investigating for secondary causes of acute CSCR.

There were several limitations to our study. This series involved a retrospective review of only patients in whom fluorescein angiography was performed. Many other

patients who did not have fluorescein angiography were excluded from the analysis. Hence, the angiographic characteristics may not be representative of the entire population group. Nevertheless, we feel that the results of this retrospective series will provide a useful basis for a more comprehensive prospective review of this common condition in Asians.

Competing interests: None identified

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