

Angiographic characteristics of contralateral asymptomatic eyes in acute Central serous chorio-retinopathy in an Asian population



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ABSTRACT

Background: Acute Central serous chorioretinopathy (CSCR) is characterised by an idiopathic circumscribed serous retinal detachment, usually confined to the central macula. **Aims and Objective:** We aimed to analyse the angiographic characteristics of contralateral asymptomatic eyes of patients presenting with acute CSCR in an Asian population. **Materials and Methods:** This is a retrospective study of 70 consecutive patients presenting with acute CSCR who underwent detailed fundus evaluation and fluorescein angiography within one year period. **Results:** Fluorescein angiograms of 70 patients were analysed. Male to female ratio was 10.66: 1. The age range of patients was (24-54) years, median 37 years and mean age 38.37 years with standard deviation 6.78. Active tobacco use was found in 34 (48.6%) eyes and systemic steroid use in 2 (2.8%) eyes. Majority, 48 (34.3%) of symptomatic and all 70 (100%) of contralateral asymptomatic eyes had presenting best corrected visual acuity (BCVA) of $\geq 20/60$. All 70 (100%) of symptomatic eyes had angiographic evidence of leakage in comparison to only 25(35.7%) of contralateral asymptomatic eyes. Multi-focal leakage was seen in 21 (30%) of symptomatic eyes and 6 (8%) of asymptomatic eyes, inkblot leakage pattern being the most common in seen in 57 (81.4%) of symptomatic and 16 (22.8%) of asymptomatic eyes. The most common site of leakage was central seen in 62 (88.5%) of symptomatic eyes and 19 (27.1%) of contralateral asymptomatic eyes. **Conclusion:** The findings in our study were comparable to other Asian studies. A considerable number of patients had angiographic evidence of CSCR in the contralateral asymptomatic eye.

Key words: Central serous chorio-retinopathy; Fluorescein angiography; Visual acuity; Asian

INTRODUCTION

Central serous chorioretinopathy (CSCR) is characterised by an idiopathic circumscribed serous retinal detachment, usually confined to the central macula, caused by leakage of fluid through the retinal pigment epithelium (RPE) as defined by fluorescein angiography (FA).¹ CSCR is mostly unilateral in presentation, but in few cases can have bilateral presentation.²⁻⁴ There are very few studies analysing the fundus and angiographic characteristics in the contralateral asymptomatic eyes in patients with acute unilateral presentation. Bujarborua et al. in their analysis of

229 eyes have observed angiographic evidence of CSCR in 31.52 % of contralateral asymptomatic eyes.⁵ Iida T et al. observed choroidal venous dilation (36%) and choroidal hyper-fluorescence (62%) by FA and Indocyanine green (ICG) angiography in contralateral asymptomatic eyes.⁶ There are various studies regarding the angiographic characteristics of acute CSCR in the Western population,⁷⁻⁹ but very few such studies on Asian eyes.¹⁰⁻¹⁴ Moreover, there are no studies from Asian population which have primarily analysed the angiographic characteristics in the asymptomatic fellow eye. This study aims at analysing the fluorescein angiographic features of CSCR in the

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asymptomatic fellow eyes in patients with acute unilateral symptomatic presentation.

MATERIALS AND METHODS

A series of 70 consecutive patients presenting with acute idiopathic CSCR to Biratnagar Eye Hospital between January 1, 2017 and Dec 31, 2017 was retrospectively studied. The study was approved by hospital review board and was carried out in accordance with the the declaration of Helsinki.

All patients with diagnosis of acute CSCR presenting for the very first time were included in the study.

CSCR was first diagnosed clinically using a binocular indirect ophthalmoscope and by biomicroscopic examination of the retina using a 90 diopter lens. The uncorrected and the best-corrected visual acuity were then recorded for both eyes separately. They were then subjected to a detailed FFA of both eyes. Acute idiopathic CSCR was defined as circumscribed serous detachment, usually confined to the central macula, caused by leakage of fluid through the retinal pigment epithelium (RPE) as defined by fluorescein angiography without other possible cause such as inflammation, exudation or choroidal neovascularisation, and with signs and symptoms lasting not more than 6 months. Cases with coexisting ocular or macular disease were excluded. Patients with prior history of CSCR and allergy to fluorescein were excluded from the study.

Unilateral symptomatic CSCR was defined as patients with signs and or symptoms of CSCR in one eye but who did not report any visual problems in the fellow eye.

All angiograms were retrieved from the digital database using the Topcon Retinal camera system (TRC 50 EX). Fluorescein angiogram (FA) of the symptomatic as well as fellow asymptomatic eye was analysed in regards to the number, location, shape, and topography of the leakage points.

A smokestack leakage first arises superiorly, resembling a smokestack, and then plumes out laterally as the angiogram progresses (Figure 1).

An inkblot leakage is manifested as a small dot leak that appears early and increases in size and intensity as the angiogram progresses (Figure 2).

A nonspecific leakage represents either patches of diffuse or focal granular hyper-fluorescence caused by retinal pigment epithelium (RPE) decompensation (Figure 3).



Figure 1: Single arrow showing smokestack leakage and double arrows showing PED



Figure 2: Multifocal inkblot leakage



Figure 3: Arrows showing non-specific leakage

Pigment epithelial detachment (PED) revealed mostly early, and in few cases delayed, homogenous hyper-fluorescence (Figure 1).

Mixed finding denotes any combination of above findings.

Uni-focal leakage is used to describe a solitary site of leakage while multifocal leakage is used when there is more than one site of leakage. The site of leakage will be classified into 3 groups: 1) the central 2) the peri-papillary and 3) the periphery. The central was defined as the region that coincides with the course of the major temporal blood vessels centred on the fovea with an approximate diameter of 5.5mm, whereas the peri-papillary area is that one within 1 disc diameter of the optic nerve, excluding the macula region, and the periphery is the area outside the macula and peri-papillary region.

Statistical Analysis: Obtained data was analysed using SPSS 16.

RESULTS

A total of 70 patients met the inclusion criteria. The majority of them were male (64/91.4%). Male to female ratio being 10.66: 1. There was an almost equal involvement of right eye (RE) (34/48.6%) and left eye (LE) (36/51.4%). The age range of patients was (24-54) years, median 37 years and mean age 38.37 years and standard deviation 6.78. Active tobacco use was found in 34 (48.6%) eyes and systemic steroid use in 2 (2.8%) eyes. Forty-eight (34.3%) of symptomatic eyes had presenting best corrected visual acuity (BCVA) of $\geq 20/60$, 14 (20%) had BCVA of ($< 20/60 - 20/200$) and 8 (11.4%) had BCVA $< 20/200$. However, all 70 (100%) of contralateral asymptomatic eyes had BCVA of $\geq 20/60$. All 70 (100%) of symptomatic eyes had angiographic evidence of leakage in comparison to only 25(35.7%) of contralateral asymptomatic eyes. Among the symptomatic eyes, 49 (70%) had single leak, 21 (30%) had multiple leaks in fluorescein angiography. In the asymptomatic eyes, 19(27.1%) had single leak and 6(8%) had multiple leaks. Inkblot was the most common type of leakage seen in 57 (81.4%) of symptomatic eyes, followed by mushroom pattern seen in 5(7.1%) of eyes. Even in contralateral asymptomatic eyes, inkblot was the more common type of leakage, seen in 16 (22.8%) eyes, followed by mushroom pattern in 1(1.4%) eyes, mixed pattern in 1(1.4%) eyes and non-specific leakage in 7(10%) eyes. The most common site of leakage was central seen in 62 (88.5%) of symptomatic eyes and 19 (27.1%) of contralateral asymptomatic eyes. Rest of the symptomatic eyes had peri-papillary leakage in 4 (5.7%) eyes and remaining 4(5.7%) had leakage in mixed sites, whereas the remaining of the asymptomatic eyes had peri-papillary leakage in 4(5.7%) eyes and peripheral leakage in 2 (2.8 %) eyes. Very few patients had CSCR associated with PED,

seen in only 5 (7.1%) of symptomatic eyes and 1(1.4%) of contralateral asymptomatic eyes.

DISCUSSION

This prospective study looked at the angiographic characteristics of contralateral asymptomatic eyes of patients presenting with acute unilateral symptomatic CSCR in Asian population. The unique feature of this study is the angiographic features of acute CSCR in the contralateral asymptomatic eye in an entirely new population. Only few studies from Asia have described the angiographic features of acute CSCR.¹⁰⁻¹⁴ Few other studies from Taiwan and China have described the epidemiology, demographics and prevalence of CSCR in Asian population.^{15,16}

The patient demographics of acute CSCR in our population were compared to that reported in other Asian studies. The male-to-female ratio ranged from 3.9: 1 to 5.7:1 in Asian population,¹¹⁻¹³ higher than reported in European and American populations.^{8,17} In the present study it was even higher (10.66:1) which was similar to the finding in an Egyptian population as quoted by MM Shahin⁹ and in a recent study conducted in Indian population.¹⁰ As reported by MM Shahin et al. the higher male incidence might be due to greater stress in male population. The mean age of presentation of (38.37 + 6.78) years in this study group was similar to mean age of 34.30years and 41 years reported in earlier Asian populations.^{10,12}

The inkblot pattern of leakage was by far the most common leakage pattern seen on angiography both in symptomatic 57(81.4%) and contralateral asymptomatic eyes (16/22.8%). This was comparable to the findings in other Asian and Western studies.^{8,10,12} Mushroom pattern of leakage was seen in only 5(7.1%) of symptomatic eyes and 1(1.4%) of asymptomatic eyes which was far less in comparison to other Indian studies 22.51%¹⁰ and 14.4%.¹⁸

In this study, 25(35.7%) of contralateral asymptomatic eyes had angiographic evidence of leakage at presentation, thus bilateral disease was seen in 35.7 % which is slightly lower than reported in a Singaporean study 42% (54/128).¹² Study from Pakistan had similar finding as in our study 22(34.4%).¹³ Our finding is much higher than a recent study from India.¹⁰ Only 38 (10.11%) of patients had bilateral CSCR at initial visit, however the number increased to 128 (34.04%) in subsequent visits. The tendency for bilaterality was found to increase with a longer follow-up in other studies also.^{2,19,20}

Multifocal leakage was seen in 21(30%) of symptomatic and 6(8%) of asymptomatic eyes, slightly lower than reported in

other Asian studies (44%-55.72%),^{12,10} however exceeding those reported in non-Asian populations.^{21,22}

Very few patients had CSCR associated with PED, seen in only 5 (7.1%) of symptomatic eyes and 1(1.4%) of contralateral asymptomatic eyes similar to the finding of Perkis et al.(8 %).²³ However, another the study done in Pakistan reported a very high incidence of PED (45.3%).¹³

In the study done by Bujarborua et al. PED was exclusively found in 17.14% of the asymptomatic eyes much higher than that reported in our study. The difference might be due to the fact that our study was conducted only in acute CSCR cases and PED has been shown to be more common in chronic CSCR¹³

The most common site of leakage was central seen in 62 (88.5%) of symptomatic eyes and 19 (27.1%) of contralateral asymptomatic eyes. A similar high incidence of macular involvement has been reflected both from Asia^{10,12} as well as from the non-Asian population.⁹

Regarding risk factor, active tobacco use in the form of Paan, ghutka, cigarette, bidi was found to be the most common risk factor seen in 34 (48.6%) eyes, this finding was much higher than reported in other studies (9.37 %).¹³ Systemic steroid use was seen in only 2 (2.8%) eyes. We did not assess the personality type and the level of depression/stress level as done in other studies.^{16,17} No association was found with systemic hypertension, sleep disorders or medicinal herbs.

The present study found that all (70/100%) the patients had visual acuity 20/60 or better in the asymptomatic eye highlighting the fact that good visual acuity might be one of the main reasons for asymptomatic presentation despite having an angiographic evidence suggestive of CSCR. Bujarborua et al.in their study also demonstrated visual acuity 20/30 or better in the asymptomatic eye.⁵ On the contrary, only (48/34.3%) of patients had visual acuity better than 20/60 in the affected eye in our study.

Limitations of the study:

There were several limitations to our study. Our study involved only patients with acute CSCR, they could not be followed up and only the initial data was available. Hence the angiographic characteristics may not be representative of the entire disease spectrum, the percentage of bilaterality might have increased with follow up data. In our study, ICG angiography could not be done since it is not available in our setup. The small sample size was another limitation. To the best of our knowledge, this was the first work of its kind in Asian population. Bilateral and multifocal involvement is a common presentation. The results

of this retrospective series will provide a useful basis for a more comprehensive prospective review in future.

CONCLUSION

The main outcome of this study is the categorisation of FA findings in the fellow asymptomatic eyes of cases with acute CSCR in one eye at the initial visit. This study specifically analysed the various types of findings in affected and contralateral asymptomatic eye and found that these eyes are at risk for symptomatic episodes in near future. Moreover, this study indirectly supports the view that CSCR is basically an asymmetrically developed bilateral disease process.

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Authors Contribution:

RLG- Concept and design of the study, data collection, manuscript preparation, statistically analyzed and interpreted, critical revision of the manuscript;
AA- statistical analysis.

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