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RISK FACTORS AFFECTING RESOLUTION OF CENTRAL SEROUS CHORIORETINOPATHY

Ophthalmology

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ABSTRACT

AIM OF THE STUDY: To evaluate the role of ocular and systemic factors on resolusion of acute CSCR episodes. The purpose of the study is also to determine the association between ocular and systemic risk factors of CSCR in relation to resolution of the disease using central macular thickness and visual acuity.

METHODS: This prospective observational case series recruited 65 patients of acute central serous chorioretinopathy (CSCR), who were followed-up for 6 months. Diagnosis and follow-up were attained by dilated fundus examination, digital fundus fluorescein angiography (DFA), ocular comprehensive tomography (OCT) and assessment of best-corrected visual acuity by Snellen's Acuity Chart.

RESULT: Higher reduction of central macular thickness and greater improvement in visual acuity were seen in spontaneous resolution group compared to subjects of delayed resolution of CSCR (p<o.oo4) who were associated with some ocular and systemic factors.

CONCLUSION: Systemic risk factors like persistent stress, hypertension, type A personality and ocular factors i.e. multiple leakages, pigment epithelial detachment (PED) and recurrent attacks influence the resolution process and affect final visual outcome.

KEYWORDS

central serous chorioretinopathy (CSCR), pigment epithelial detachment (PED), retinal pigment epithelium (RPE), central macular thickness (CMT), best corrected visual acuity (BCVA), hypertension, stress.

INTRODUCTION

Acute Central serous chorioretinopathy is characterized by serous detachment of neurosensory retina secondary to one or more focal lesion of the retinal pigment epithelium, chorodal hyperpermeability, and increased choroidal thickness.[1] Choroidal fluid leakes beneath the central macula of retina due to small break in the retinal pigment epithelium resulting in sudden painless central visual deterioration.[1-3] Acute CSCR affects the middle aged working group of male whose working ability is compromised due to vision impairment. Most cases resolved spontaneuously within 3-4 months. Usually CSCR have good visual prognosis.[3,4,5,6] Choroidal vasodilation and leakage through the RPE are mechanism of CSCR and subretinal fluid reabsorption depend on pumping capacity of RPE cells. . Some patients with reduced visual acuity and incomplete resolution are associated with some factors related to persistent epithelial detachment and subretinal fibrosis. [7,8] Observation is the initial management. Ocular factors like ischemia due to recurrent diseases ,stasis due to bullous retinal detachment, inflammation leading to subretinal fibrosis are the important factors influencing the resolution of CSCR. Systemis factors are also responsible for elevated circulatory cortisol and epinephrine in stressful event ,type A personality, hypertension, smoking, corticosteroid intake which affect the auto regulation of the choroidal circulation.[1,2] OCT has been able to find out the track of resolution of chronic CSCR by identifying the choroidal thickness. Visual acuity measurement which is the most favourable visual outcome in patient with acute CSCR is determined by Snellen's BCVA chart and it is converted to Log MAR value for statistical analysis. Now a day's stressfull events are increasing in day to day life. The duration of resolution process of acute CSCR related to stress full events and other systemic and ocular factors need to be monitored to provide the appropriate treatment to reduce the blindness period of middle-aged working individuals.

MATERIALAND METHOD

Design: Prospective, consecutive, observational, clinical study. Study population was patients of CSCR involving 65 eyes of the 65 patients.
Period of study**:** One year, from March 2015 to February 2016.
Study setting: Retina clinic in Regional Institute of Ophthalmology, Kolkata.

Study subjects: Patients who were diagnosed as monocular acute central serous chorioretinopathy at Retina Clinic of Regional Institute of Ophthalmology, Kolkata.

Exclusion criteria: Patients suffering from other serous detachments due to specific causes and patients suffering from chronic central serous chorioretinopathy were excluded from the recruitment of study subjects.

Sample estimation and sampling technique
Sample size was estimated 68 according to previous prospective,clinical study. All patients who attended retinal clinic in the study period with monocular acute CSCR within one month were enrolled in this study.

STUDY VARIABLE

Central macular thickness which may vary due to resolution process. Recovery of best corrected visual acuity may vary depending on the arrangement of photoreceptors.

Ethical considerations: The research proposal was approved by the Ethics Committee of Calcutta Medical College and Hospital, Kolkata. Before the study was conducted, Informed consent was also obtained from each of the study participant.

Outcome : Resolution of serous detachment, elimination of symptom, recovery of visual acuity, changes of central macular thickness within normal limit were considered as outcome of the study.

Materials and Methods: The institutional Ethical Committee of Medical College and Hospital issued ethical clearance certificate. The clinical presentation was assessed by present complain, history of present illness, history of past illness, general survey, general examination and comprehensive ophthalmic examination which included external ocular examination, intraocular pressure measurement by applanation tonometry, slit lamp bio microscopy with + 90 D lens, fundoscopic examination with fundus contact or non contact lens and indirect ophthalmoscope. Acute monocular CSCR diagnosis was confirmed by Optical Coherence Tomography (OCT) and fundus fluorencein angiography findings in the Retina Clinic of Regional Institute of Ophthalmology, Kolkata. Spontaneous resolution was determined in affected eye by comparing the measurement of central macular thickness and BCVA at 3 and 6 months. Resolution also re-evaluated in affected eye at the end of 6 months measuring the changes of CMT and BCVA.

Data collection : Base line data was collected by visual acuity measurement, CMT assessment, evaluation of systemic risk factors

and identification of the ocular factors and the same parameters were assessed at consecutive follow -up visits at 3 and 6 months.

STATISTICALANALYSIS

The descriptive analysis, mean standard error depending on data distribution was done. The statistical analysis was done using the student 't' test and Mann-Whitney test.

RESULT

Demographic and clinical characteristics:

Sixty eight patients who were suffering from acute Central Serous Chorioretinopathy, were followed up in Retina clinic of RIO, Kolkata, during study period. Among them 68 eyes of 68 patients were diagnosed as monocular acute CSCR. Three patients were lost to follow-up visits. Only 65 patients of them come for two consecutive follow up examinations. Demographic data were listed in table I. Among the study participant 85 % male was suffering from acute CSCR. Mean age of the study population was 36.67±5.34 years. Systemic risk factors for CSCR were present in 13 (20%) patients who demonstrated delayed resolution and incomplete recovery of visual acuity.. Only stress factors for CSCR were found in 6 % patients. Eight (12 %) patients were associated with ocular risk factors resulting in delayed resolution of serous detachment and incomplete recovery of visual acuity. Total 21 among 65 patients with CSCR showed delayed resolution and incomplete recovery of visual acuity.

TABLE 1:
DEMOGRAPHIC AND CLINICAL CHARACTERISTICS AT BASELINE

Parameter	Total n=65	Spontaneous resolution n=44(67.69 %)	Delayed resolution n=21(32%)	P Value
Gender Male Female	56(85) 9(15)	36 8	20 1	0.107804
Age, year, mean±SD	35.33±5.818	36.77±6.17	34.42±5.18	
Ocular factors : Large PED Multiple leakage in DFA Sub retinal fibrosis Recurrent disease	8(12 %) 2 2 2 2	1	7	<0.0001 significant
Systemic factors: Stress Hypertension TypeA personality Smoking Corticosteroid	13((20%) 4 3 2 2 2	1	12	<0.001

TABLE 2:
PRESENTATION OF CSCR PATIENTS AND HEALTHY INDIVIDUALS DURING ENROLMENT OF STUDY SUBJECTS.

Variables	CSCR patients(n=65)	Healthy subjects(n=30)
Mean CMT	411.7±29.86	252±7.501
Mean BCVA in logMAR	0.6±0.17	0.1±0.1

Table 3 :
COMPARISON OF CENTRAL MACULAR THICKNESS BETWEEN INCOMPLETE RECOVERY OF CSCR AND NORMAL EYE

Ocular factors	variables	Diseased eye	Normal eye	P Value
Large PEd, multiple leakages, subretinal fibrosis, recurrent disease, bullous RD	Mean CMT	393.5±7.778	253±4.242	P<0.001
Systemic factors				
Hypertension, stress	Mean CMT	300.5±3.535	252±1.414	P=0.004

TABLE 4:
COMPARISON OF BCVA AMONG DIFFERENT GROUPS OF CSCR PATIENTS WITH NORMAL EYE

	Variables	Diseased eye	Normal eye	P value
Spontaneous resolution	Mean BCVA	0.089±0.078	0.0333±0.051	P=0.7418 Not significant
Delayed resolution	Mean BCVA	1.15±0.071	0.1±0.141	P=0.0008 Significant

Clinical course

Among the study participant 95 % patient completed up to 6 months follow up. One patient was lost in follow up at 3 months and 2 patients did not turn up at 6 months visit. Spontaneous resolution was observed among 67.69% (n=44) patients at 3months. 13 (20 %) patients were associated with non-resolving CSCR related to systemic factors that included 4 patients with stress, 3 patients with uncontrolled hypertension, 2 patients of type A personality, 2 patients with habit of smoking and 2 patients using corticosteroid for prolonged period. Eight (12 %) patients of persistent symptoms of CSCR were associated with ocular factors that demonstrated 2 patients with large PED, 2 patients with multiple leakages in DFA, 2 patients with sub retinal fibrosis and 2 subjects of recurrent attacks.

DISCUSSION

Usually visual prognosis for CSCR patients is relatively good.[1] Resolution of neurosensory detachment occurs by 3 to 4 months. Improvement in visual acuity can be seen up to 12 months. Klein and co-workers observed resolution process in 34 eyes prospectively without any treatment and demonstrated that average resolution time was 3 months and all the patients had visual acuity 20/40 or better in 94 % patients having 20 / 30 or better.[3] Another study showed 75 % patients of their series had visual acuity of 20 / 20 at the final follow-up examination.[4] Levin and co-investigators first suggested that visual prognosis is not as benign as previously thought.[7] These investigators followed-up 14 patients of CSCR with fluorescein angiography and concluded that CSCR may be a progressive diffuse RPE disorders in some patients.

This study shows that the acute CSCR usually is a unilateral disease affecting young males who presented with sudden onset of visual impairment. The mean age of study population was 36.67±5.34 years with 88.67 % male mainly belonging to working age- group. Numbers of male patients are more than female patients. Modifiable systemic risk factors mainly stress was persistent in the resolution process of acute CSCR in 6 % patients. Various other studies all over the world reported that CSCR is a multifactorial disease, where median age is from 40-44.7 years and males are more affected.[8] The ocular factors which have been observed in this study to imply incomplete resolution of the disease process are as follows:

Multiple leakages and large multiple PED cause gradual photoreceptor and RPE degeneration with resultant visual impairment. Subretinal fibrin exudation stimulates subretinal fibrosis leading to permanent visual loss. Long-standing and recurrent PEDs present with pigment migration or atrophy.[9] Bullous retinal detachment, subretina fibrosis and RPE track have been described in patients with CSCR and possible pathophysiologic explaination has been suggested in one study.[10]

Systemic factors observed in this study to affect the resolution of the disease are as follows:

Hypertension is usually associated with generalized defect in cell membrane and Na^+ transport system. Two subjects of this study showed incomplete resolution of CSCR. Similarly 4 patients of stress disorder, 2 cases of chronic user of corticosteroid and 2 cases of chronic smoking demonstrated incomplete resolution and recovery of visual acuity in the follow-up of the disease. It is hypothesized that stress, smoking and corticosteroid invite excessive release of norepinephrine from locus cerulus, hippocampus and amygdale of central nervous system, resulting in hypermeability and ischemia of choriocapillaries, the common pathway to the development of serous detachment.[11]

CONCLUSION

In Eastern India,majority of the cases of acute CSCR persists in working young people mainly who suffer from stress as well as are associated with others systemic factors like hypertension, type A personality , corticosteroid intake and smoking. Similarly ocular

factors such as large PED , multiple leakages, sub retinal fibrosis , recurrent disease and bullous RD result in delay of the resolution process and incomplete recovery of visual acuity.

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