

## Effect of Stress on Central Serous Chorioretinopathy & Correlation with type of leak on FFA

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### Abstract:

**Introduction:** Central Serous Chorioretinopathy (CSCR) is an idiopathic disorder with neurosensory detachment primarily affecting the macula.

**Aim:** The aim of this study was to evaluate the stressful events of life within 1 year preceding onset of CSCR and study the correlation with the type of leak.

**Materials and Methods:** A prospective study was done on 30 patients of CSCR in a tertiary care centre. Demographic data and history were noted, a comprehensive ophthalmic examination was done. All cases underwent OCT & fundus fluorescein angiography (FFA). They were given a Social Readjustment Rating Score (SRRS) based on life change units in the past one year based on a questionnaire. 30 patients from normal population formed a control group.

**Results:** 93.3% were males, mean age was 38 yrs. The mean SRRS was 136.73 in the CSCR group compared to 100.5 in the control group. 40% patients in the CSCR group had scores above 150 compared to 30% in the control group. 50% of the patients with multifocal leak had SRRS between 150-299 compared to 36.36% among patients with single leak.

**Conclusion:** Psychological stress plays a significant role in triggering or exacerbating CSCR. Relaxation therapies & stress management programmes may help in preventing recurrences.

**Keywords:** Central Serous Chorioretinopathy (CSCR), Holmes Rahe Scale, Social Readjustment Rating Score (SRRS), Fundus fluorescein angiography (FFA).

### I. Introduction

Central Serous Chorioretinopathy (CSCR) is a disorder characterized by serous retinal detachment and/or retinal pigment epithelial (RPE) detachment in the macula. There is exudation from parafoveal or choroidal capillaries causing oedema limited to the macula. CSCR is the fourth most common retinopathy after ARMD, diabetic retinopathy and retinal vein occlusions.<sup>[1]</sup> The term Central Serous Chorioretinopathy was first used in 1967 by Gass.<sup>[2]</sup> It is a multifactorial disease with complex pathology. It occurs commonly in young adult males<sup>[3]</sup> with type A personality.<sup>[4]</sup> It may be associated with corticosteroid use,<sup>[5-9]</sup> and obstructive sleep apnoea.<sup>[10,11]</sup>

Patients usually present with blurred vision, metamorphopsia, micropsia or a relative central scotoma.<sup>[12,13]</sup>

CSCR has been associated with severe psychosocial stressors.<sup>[14,15]</sup>

Thomas Holmes and Richard Rahe in 1967 designed Social Readjustment Rating Score based on 43 life events to study if stress contributes to an illness.<sup>[16]</sup> Rather than taking an unstructured history they thought it is better to have a list of commonly involved stressors which ranged from death of spouse to change in sleep pattern. Each event called a Life Change Unit has different points allocated to it. (Table 1). The scores are totaled up for the events that have taken place in the last one year. If an event has occurred twice the score for that event is added twice.

A score of less than 150 points implies a relatively low amount of susceptibility to stress-induced health breakdown. 150-299 points indicates about a 50% chance of a major health breakdown. Scores above 300 points increase the odds to about 80%.

### II. Materials & Methods

A prospective study of effect of stress on Central Serous Chorioretinopathy & correlation with the type of leak on fundus fluorescein angiography (FFA) was done at a tertiary care Centre of the Armed Forces catering to serving personnel, ex-servicemen and their families from Jan 2015 to Dec 2015.

30 cases of freshly diagnosed Central Serous Chorioretinopathy were examined in detail. The patients demographic data was noted. A complete ophthalmological examination (Snellen visual acuity, slit lamp,

fundoscopy) and specialized investigations OCT and FFA were done in all cases. The control group (30 patients) were taken from normal general population.

Within 6 weeks of onset of symptoms patients were asked a questionnaire based on Holmes and Rahe Stress Inventory. [Table 1]. The scores for all 43 life events were totaled up.

### III. Results

A total of 30 patients were evaluated. 93.3% (28) were males. ( $P < 0.001$  chi-square test). The mean age was 38 years. 10% (3) patients had bilateral CSCR, 60% (18) had left eye and 30% (9) right eye involvement. The mean score on the Holmes Rahe Scale was 136.73. The maximum score was 235 (individual was staying away from family, changed to a diff line of work, change in working hrs/ conditions, was a case of Duodenal ulcer had change in sleeping pattern and was due for retirement). The minimum score was 46. The distribution of the various scores is shown in Graph 1. 60% (18) patients had scores below 150, they had 30% chance of developing stress. 40% (12) patients had scores between 150-300, they had 50% chance of developing stress related disease. (Graph 2).

In the control group the mean score was 100.5. The maximum score was 202 and minimum was 44. 70% (21) patients had scores below 150, 30% (9) patients had scores between 150-300. (Graph 3).

60% (18 patients) had inkblot leak, 26.6% (8) had multifocal leak and 13.3% (4) had smoke stack leak. 50% of the patients with multifocal leak had SRRS between 150- 299 compared to 36.36% among patients with single leak. (Graph 4)

### IV. Discussion

Psychological factors precipitate, and contribute to, the morbidity of many psychosomatic disorders. Wang et al<sup>[1]</sup>, Spahn et al<sup>[14]</sup> and Conrad et al<sup>[15]</sup> noted that patients with poor coping mechanisms when exposed to a stressful situation like divorce, critical illness developed CSCR. Gelber et al<sup>[17]</sup> found that acute stressors preceded the onset of CSCR by a week. They also observed that removal of the stressor lead to improvement in the visual acuity within weeks. Conrad et al<sup>[15]</sup>, Gelber et al<sup>[17]</sup> and Conrad et al<sup>[18]</sup> found higher incidence of critical life events in patients of CSCR. Tatham et al<sup>[19]</sup> noticed that treatment with beta blockers reduced sympathetic stress and may help in preventing recurrences. Sun et al<sup>[20]</sup> found elevated levels of catecholamines, adrenaline and noradrenaline in patients of CSCR. Tiwari et al<sup>[21]</sup> observed significantly increased sympathetic activity in patients of CSCR.

In our study compared to healthy controls CSCR patients showed a significantly higher degree of emotional stress. The stress scores as measured with the Holmes Rahe Scale was 136.73 in the CSCR group compared to the control group where it was 100.5. A larger number of patients had scores above 150 in the CSCR group (40%) compared to the control group (30%). Patients with multifocal leak had higher stress score compared to patients with single leak. (50% had score above 150 vs 36.6%)

The limitations of this study is the small sample size. The Holmes Rahe Scale may not be ideal for Indian population.

### V. Conclusion

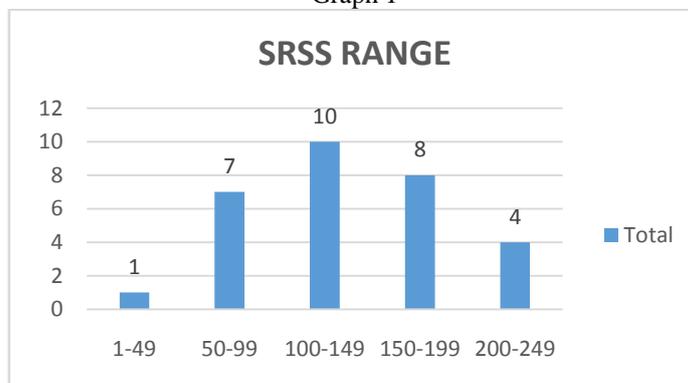
CSCR is an idiopathic disease in which stress plays a role. Relaxation therapies & stress management programmes may help in preventing recurrences which is of paramount importance as 30-50% patients develop recurrences within one year<sup>[22]</sup>.

**Table 1**

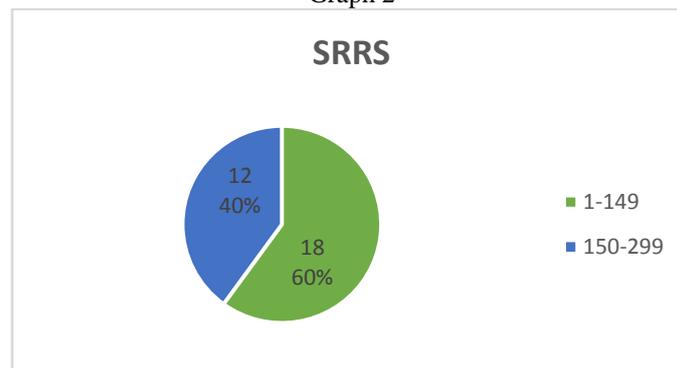
Life event	Life change units
Death of a spouse	100
Divorce	73
Marital separation	65
Imprisonment	63
Death of a close family member	63
Personal injury or illness	53
Marriage	50
Dismissal from work	47
Marital reconciliation	45
Retirement	45
Change in health of family member	44

Life event	Life change units
Pregnancy	40
Sexual difficulties	39
Gain a new family member	39
Business readjustment	39
Change in financial state	38
Death of a close friend	37
Change to different line of work	36
Change in frequency of arguments	35
Major mortgage	32
Foreclosure of mortgage or loan	30
Change in responsibilities at work	29
Child leaving home	29
Trouble with in-laws	29
Outstanding personal achievement	28
Spouse starts or stops work	26
Beginning or end school	26
Change in living conditions	25
Revision of personal habits	24
Trouble with boss	23
Change in working hours or conditions	20
Change in residence	20
Change in schools	20
Change in recreation	19
Change in church activities	19
Change in social activities	18
Minor mortgage or loan	17
Change in sleeping habits	16
Change in number of family reunions	15
Change in eating habits	15
Vacation	13
Christmas	12
Minor violation of law	11

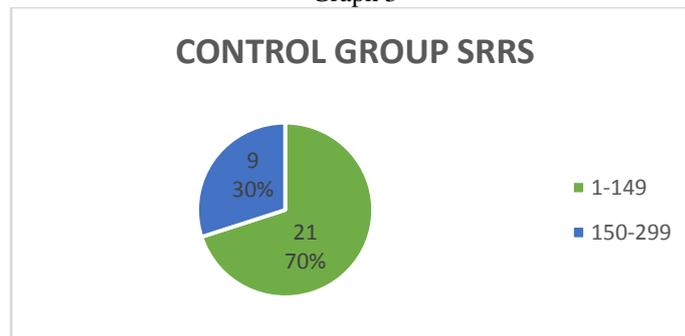
Graph 1



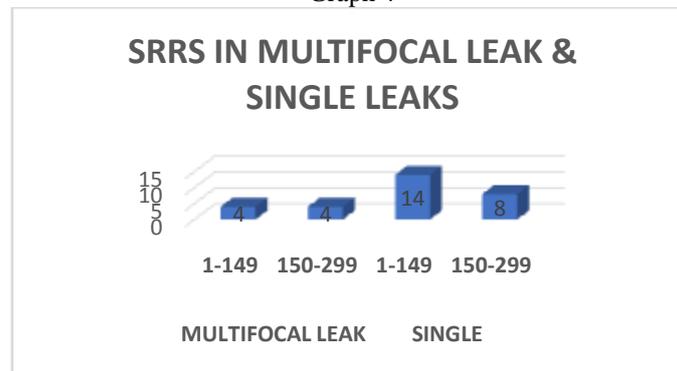
Graph 2



Graph 3



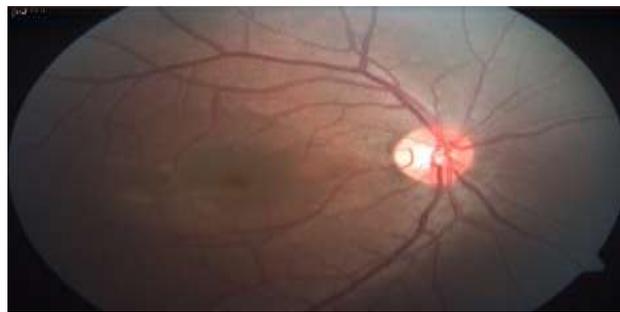
Graph 4



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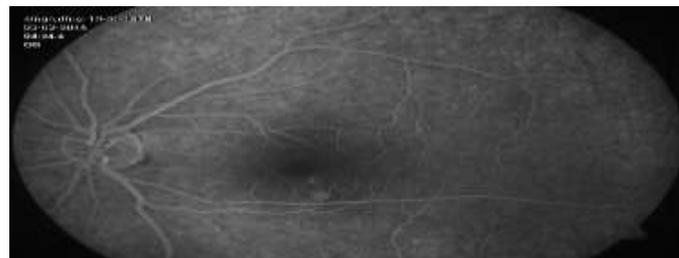
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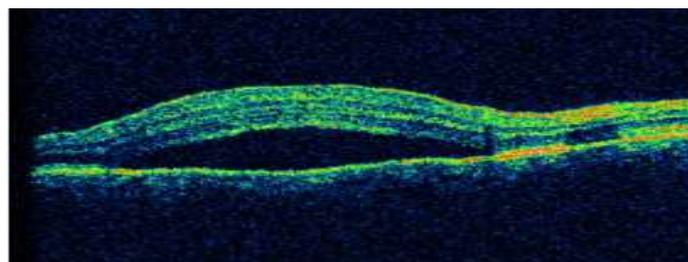
**Figure 1- CSCR RE**



**Figure 2- Inkblot leakage on FFA**



**Figure 3- Multifocal leaks on FFA**



**Figure 4- OCT Neurosensory detachment**