The Incidence of Central Serous Chorioretinopathy in Bank Employees

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ABSTRACT

Purpose: This study aimed to compare the incidence of Central Serous Chorioretinopathy (CSC), which is thought to be associated with stress, in bank employees and the frequency of its detection in routine outpatient clinic examinations.

Material and Methods: In this retrospective study, we reviewed data from 891 active bank employees aged between 26-61 years who presented to our clinic between May 2021 and May 2022. A complete ophthalmological examination including visual acuity, intraocular pressure, anterior and posterior segment examination as well as OCT scan (Spectralis OCT, Heidelberg Engineering, Heidelberg, Germany) and FFA (CANON EOS, CF-1) were performed in all cases diagnosed with CSCR. Equal number for age- and gender-matched cases who presented for routine eye controls were determined as the control group.

Results: We retrospectively screened 891 (401 women, 490 men) bank employee. Active CSCR was diagnosed in 7 patients. In addition, we retrospectively evaluated data from 891 age- and gender-matched subjects (401 women, 490 men) as controls. Active CSCR was diagnosed in only 1 patient in the control group. The CSCR incidence was calculated as 0.008 in bank employees whereas 0.001 in the control group, indicating a significant difference between the groups. ($p<0.001$)

Conclusion: In this study, the rate of CSCR diagnosis was found to be significantly higher in bank sector employees. This study suggests that it is necessary to be very careful in terms of posterior segment findings in the examination of employees from banking sector.

Keywords: Bank employees; visual loss; central serous chorioretinopathy; retina

INTRODUCTION

The central serous chorioretinopathy (CSCR) was first described as "recurrent idiopathic detachment of retina" by Albrecht von Graefe 150 years ago[1]. Although underlying mechanism was unclear, Hroniker proposed the concept of retinitis, suggesting an inflammatory component in the disease[2]. Today, the entity is termed as central serous chorioretinopathy which was proposed by Donald Gass in 1960s[3].

The pathogenesis of CSCR remains to be unclear today and many hypotheses have been proposed to elucidate CSCR pathogenesis. One of the most widely accepted hypotheses has proposed that CSCR is a chorioretinal disease leading idiopathic serous retinal detachment as a result of leakage at one or more areas of choroidal region through a defect in retinal pigment epithelium on blood-retina barrier[4]. CSCR causes impaired quality of life by leading a clinical picture progressing with changes in color perception and decreased visual acuity in majority of patients with CSCR[5, 6].

Although the age range varies from 7 to 83 years in CSCR, mean age was reported as 43 years[7]. Many studies supports the idea that men are affected more commonly than women and female: male ratio can reach up to 1:8[8]. There are several risk factors for development of CSCR; however, the risk factors haven't been fully elucidated. The association of high serum glucocorticoid level with CSCR has long been recognized[9]. It was also reported that, in addition to serum glucocorticoid level, serum catecholamine levels were increased in CSCR patients[10]. This suggests that CSCR results from a stress response.

Bank employees is a group which subjects to physical and mental stress at varying degrees in workplace[11]. In

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previous studies, it was shown that stress level is high in bank employees[12]. In this study, it was aimed to determine the incidence of CSCR, thought to be related to stress, in bank employee and to compare with healthy population.

MATERIAL AND METHODS

This retrospective, cross-sectional study was conducted in accordance to tenets of Helsinki Declaration. The study was approved by Ethics Committee of TO Karatay University (2022/3). All participants gave written informed consent. We retrospectively screened 891 active bank employees (aged 26-61 years) who presented to our clinic between May, 2021 and May, 2022. The subjects who received corticosteroid therapy within prior 6 months, those with systemic disease or history of medication which may affect retina or choroid, those with history of previous ocular surgery (other than uncomplicated cataract and refractive surgery, those with history of ocular trauma or chronic ocular disease and those with choroidal neovascularization or polypoidal choroidal vasculopathy were excluded. A complete ophthalmological examination including visual acuity, intraocular pressure, anterior and posterior segment examination as well as OCT scan (Spectralis OCT, Heidelberg Engineering, Heidelberg, Germany) and FFA (CANON EOS, CF-1) were performed in all cases diagnosed with CSCR. In patients with suspected polypoidal choroidal vasculopathy, ICG imaging was performed to confirm diagnosis and these patients were excluded. The diagnosis of CSCR was made by neurosensory serous detachment on OCT scan (Figure 1) and typical angiographic leakage (Figure 2a, 2b). Equal number for age- and gender-matched cases who presented for routine eye controls were determined as the control group. The control group included subjects employed in sectors other than banking.

Statistical analysis

All data were analyzed using SPSS for Windows version 22.0 (Version 22.0, IBM Co., Chicago, IL, USA). Student's t test was used to analyze outcomes fulfilling parametric measurement criteria.

RESULTS

Table 1 presents demographic characteristics of bank employees and control group. We retrospectively screened 891 (401 women, 490 men) bank employee. Active CSCR was diagnosed in 7 patients including 2 women and 5 men. In addition, we retrospectively evaluated data from 891 age- and gender-matched subjects (401 women, 490 men) as controls. Active CSCR was diagnosed in only 1 patient in the control group. For bank employees, age group was defined as 26-61 years in order to include active banking employees. Similarly, control group also included subjects aged 26-61 years. Mean age was calculated as 44.4 years among bank employees while 43.7 years in the control group ($p<0.001$). Among bank employees, mean age was 45.9 years in male patients diagnosed as 45.9 years and 43.7 years female patients diagnosed as CSCR. Mean visual acuity was 20/25 in CSCR group. Visual acuity as measured by Snellen chart was found as 20/25 in 5 of 7 patients. There was blurred vision and metamorphsia in all patients diagnosed as CSCR. The CSCR incidence was calculated as 0.008 in bank employees whereas 0.001 in the control group, indicating a significant difference between the groups ($p<0.001$)

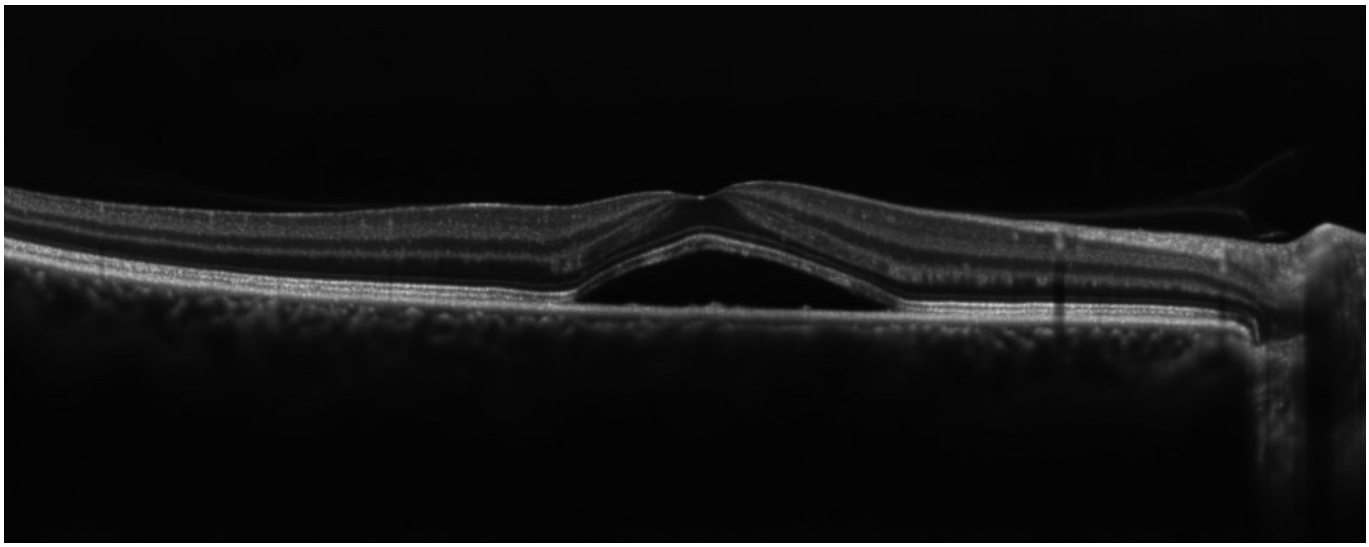

Figure 1: *Typical OCT section in active CSCR case. Neurosensory detachment was seen at early period during active phase.*

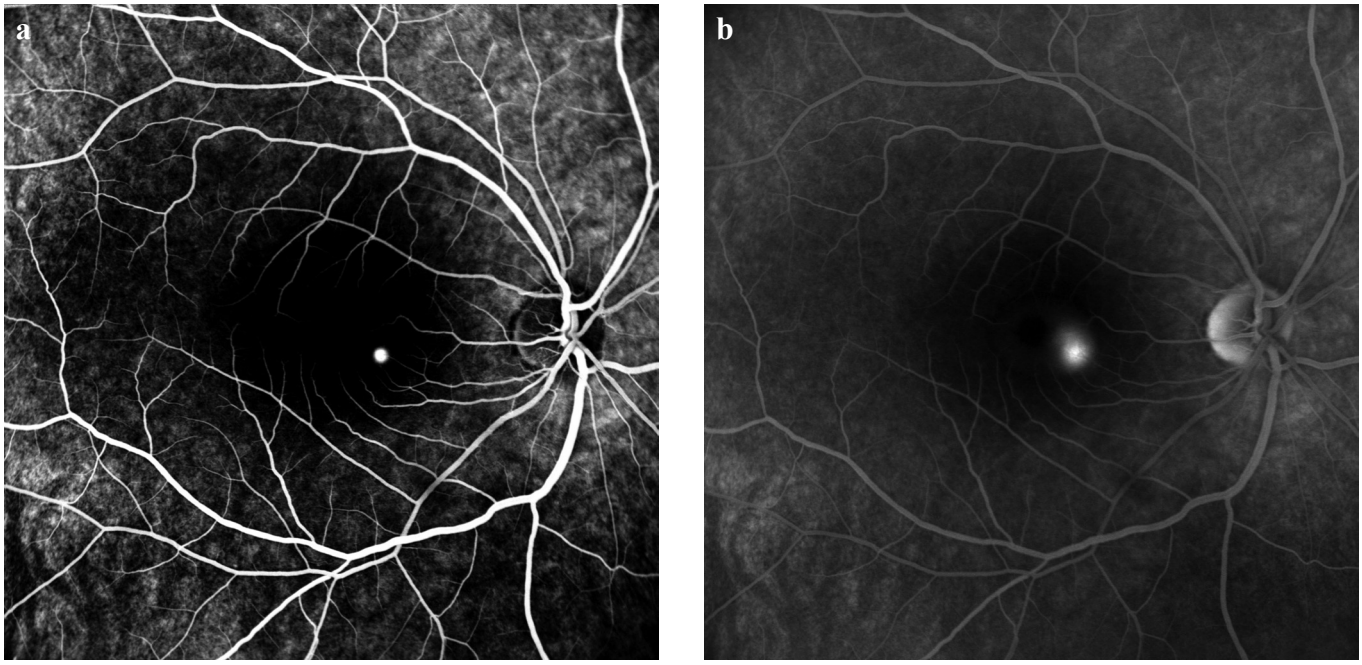

Figure 2.a. *In the same case, leakage with ink-blot appearance at lower nasal region of fovea was observed at early phase on FFA;* **b.** *Enlarged leakage was seen at late phase.*

Table 1: *Demographic characteristics of bank employees and controls*

		N	Age (year)	F	M	VA (Snellen chart)
Bank Employee	Patient	7	46.4	2 / 5		20/25
	Healthy	884	44.3	399/484		20/20
Control group	Patient	1	29	0 / 1		20/30
	Healthy	890	43.7	401/489		20/20

DISCUSSION

After it has become possible to examine choroid by OCT in 2012, investigators has defined a disease group with common features including choroidal thickening, dilatation in choroidal vessels in Haller layer, thinned choriocapillaris in Sattler layer and RPE anomalies over pachychoroid[13-16]. Subsequently, Freund et al. termed this group of disease as pachychoroid spectrum and classified CCR, pachychoroid pigment epitheliopathy[13], pachychoroid neovasculopathy (PNV)[14], polypoidal choroidal vasculopathy (PKV)[15] and peripapillary pachychoroid syndrome in this group[16]. The CSCR in this group is the fourth most common retinopathy after age-related macular degeneration, diabetic retinopathy and venous branch occlusion.

Currently, there are 4 population-based study about CSCR: studies from Minnesota, USA[17], Taiwan[18], South Korea[19] and Japan[20]. The CSCR incidence varied from 5.8: 100000 to 34: 100000 in these studies. In all studies, it was seen that annual incidence was higher in male subjects and peak age was 40-44 years in male subjects and 50-55 years in female subjects[20]. The largest study using case-control method was conducted by Ersöz et al.[21]. In this study including 811 cases with CSCR, it was found that female: male ratio was 1: 2.7 and that mean age was 46.8±9.7 years. Although number of patients was highly limited in our study when compared to population-based studies, the estimated incidence was 8: 1000 and significantly higher than general population. Although mean age was higher in male patients with CSCR in the literature, it was found to be comparable between male and female subjects in our study. In our study, CSCR was more frequently observed among male subjects in agreement with literature.

Significant changes have been observed in the working conditions of banking sector, particularly after financial crisis in 2018[22], resulting in decreased employment possibility and increased workload. Alterations during reorganization period with attempt to improve productivity had direct influence on health of bank employees as a result of increased suppression, constraint and stress[23]. In general, work-related stress resulting from many risk factors such as working condition, postural disorder, work safety, responsibility, work duration lead depressive

symptoms, cognitive anxiety, exhaustion, psychiatric disorders and visual abnormalities[24]. When demographic characteristics are reviewed more closely, it was seen that cases aged >40 years felt more unhealthy and showed depressive symptoms more commonly[25]. It was reported that exhaustion was more common in the age group of 46-54 years when compared to other age groups[26]. These findings seemed to be in agreement with our results.

The stress-related hormones, corticosteroid and catecholamines, have well-known roles in the pathophysiology of CSCR[27]. It is thought that such hormones can play role in CSCR by altering choroidal blood flow[28]. The conditions comprising risk for CSCR development include therapeutic corticosteroid use, psychological stress, type A personality and pregnancy by leading alteration in glucocorticoid metabolism[29]. The CSCR may develop in 5% of cases with endogenous Cushing disease[30]. Gelber and Yanuzzi demonstrated that CSCR incidence was increased in type A personality and unfavorable psychological events[31, 32].

Melatonin is one of the major determinant in the regulation circadian rhythm and it is released during dark phase of light-dark cycle. Light exposure including low-energy (LED) lights used in current screens reduces melatonin secretion[33]. As known, employees working in finance sector spend almost all time in front of PC during work hours. The desynchronization in the circadian rhythm due to decreased melatonin secretion resulting from excessive light exposure can lead chronic fatigue, sleep disorders, appetite disorders and depression[34]. The desynchronization in the circadian rhythm can influence on other physiological rhythmic variables. Cortisol is the one of the hormones with circadian rhythm and it may be thought that changes in cortisol level can be associated with CSCR in this group.

In a study, Spahn et al. investigated psychosomatic symptoms, personality profiles and social support at the onset of disease in patients with CSCR[35]. When sociodemographic data were reviewed in this study, it was concluded that CSCR primarily affects middle-aged men with strong social integration. Majority of patients were white collar workers with university degree who were married or had stable relationship. This profile is compatible with bank employees.

Although there are many studies on work-related stress ad diseases, the number of studies on banking sector is highly limited. It should be emphasized that one must be careful for posterior segment findings in employees in banking sector where stress burden is excessively high and should not hesitate to use imaging modalities in case of suspicion. Larger series will help to definitely establish association between work and CSCR. There is need for further epidemiological, genetic, and clinical studies in order to clarify CSCR pathogenesis and underlying mechanisms.

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