

**Association of ABO Blood Groups with Central Serous Retinopathy**Praveen CP<sup>1\*</sup>, Padmaja Krishnan<sup>2</sup>, Jyothi PT<sup>3</sup><sup>1</sup>Additional Professor, Department of Ophthalmology, Government Medical College, Kozhikode, Kerala, India<sup>2</sup>Professor, Department of Ophthalmology, MES Medical College, Perinthalmanna, Malappuram (dt), Kerala, India<sup>3</sup>Professor, Department of Ophthalmology, KMCT Medical College, Mukkam, Kozhikode, Kerala, India

Received: 18-11-2023 / Revised: 21-12-2023 / Accepted: 28-02-2024

Corresponding author: Dr. Praveen CP

Conflict of interest: Nil

**Abstract:**

**Background and Objectives:** Central serous retinopathy (CSR) is an idiopathic condition characterized by accumulation of transparent fluid with acute serous detachment of neural retina at the macula. CSR mainly affects adults in the age group of 20 to 50 years with a male predominance. It usually present as acute onset of unilateral defective vision or metamorphopsia producing significant visual morbidity in young productive adults. As the CSR is still considered idiopathic and have no genetic relations, but it is a well-known fact that duodenal ulcer has a predilection to 'O' group persons and carcinoma stomach to 'A' group.

Since the duodenal ulcer is one of the consequences of stress, which is also a predisposing factor for CSR, it is logical to search for any blood group predilection to CSR. This study was an attempt to study any individual predilection for CSR in terms of blood groups.

**Material and Methods:** The study was done inside the setting of a hospital. Patients with clinical features of CSR were chosen from the Outpatient Department (OPD) at the Ophthalmology department of the Government Medical College and Hospital, Calicut, Kerala, India using a convenient sampling method. This was accomplished subsequent to receiving authorization from the Scientific Review Committee and Institutional Ethics Committee, as well as obtaining written consent from the patients. A detailed history was taken in each case to find the association of different risk factors. Routine investigations have been done in all patients. After narrating the facts of the study, to each patient, blood group examination was also done in all patients.

**Results:** The main victims of the disease were young people between 25 to 45 years. Among them also, the peak incidence was between 36 to 40 years of age. The male to female ratio was 2.9:1. In the context of ABO system in Indian population, this study shows a most common incidence of B positive blood group in CSR patients.

**Conclusion:** Present study reflects a tendency of earlier occurrence of CSR in Indian people than Western people and does not affect the adolescents in the age group between 15-20 years. In present research, CSR is found to have a higher incidence among individuals with Blood group 'B'.

**Keywords:** ABO blood groups; Central serous retinopathy; Vision.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

**Introduction**

Central serous retinopathy (CSR) is an idiopathic condition characterized by accumulation of transparent fluid with acute serous detachment of neural retina at the macula. CSR mainly affects adults in the age group of 20 to 50 years with a male predominance.

The male to female ratio is about 8:1 to 10:1. The diagnosis of CSR is clinical. It usually present as acute onset of unilateral defective vision or metamorphopsia producing significant visual morbidity in young productive adults. The etiology of CSR is still remains as an enigma and is mostly

hypothetical. However several systemic conditions are described as predisposing conditions to CSR. This includes stress, Type A personality, pregnancy, migraine and steroid therapy.

Usually CSR is seen to be resolving spontaneously within 3-4 months. However it often recurred and complications compromising vision may sometimes occur. As the CSR is still considered idiopathic and have no genetic relations, it is justified to know whether there are any individual peculiarities in the causation of CSR, like the blood group of the individual. It is a well-known fact that

duodenal ulcer has a predilection to 'O' group persons and carcinoma stomach to 'A' group. Since the duodenal ulcer is one of the consequences of stress, which is also a predisposing factor for CSR, it is logical to search for any blood group predilection to CSR.

**Aim and Objectives:** This study was an attempt to study any individual predilection for CSR in terms of blood groups.

#### Material and Methods:

The study was done inside the setting of a hospital. Patients with clinical features of CSR were chosen from the Outpatient Department (OPD) at the Ophthalmology department of the Government Medical College and Hospital, Calicut, Kerala, India using a convenient sampling method. This was accomplished subsequent to receiving authorization from the Scientific Review Committee and Institutional Ethics Committee, as well as obtaining written consent from the patients.

**Inclusion criteria:** There were 35 patients and 37 eyes (2 bilateral cases) available as confirmed cases of CSR in 15-50 years age group in both sexes and without co morbidities.

#### Exclusion criteria:

- Age <15 years or >50 years
- Patients with history of ocular injury and other ocular pathology
- Patients having history of systemic conditions like hypertension, diabetes and others which can cause macular edema

**Sample selection:** To start with, there were 41 patients having features of CSR. Out of these 28 patients had typical features of CSR and were diagnosed clinically; 7 doubtful or atypical cases were confirmed by FFA. But 6 cases of doubtful or atypical

CSR were excluded either because of the evidence of other ocular disease or due to the noncompliance of the patients to confirm the diagnosis by FFA and to follow up. Except for 2 inpatients, all other cases were out patients. As there were 2 bilateral cases of CSR, total 37 eyes were included in the present study.

**Methodology:** A detailed history was taken in each case with special emphasis on points like the mode of onset of the symptom, the time of its first appearance and the duration. The incidences of similar illness in the same eye or in the fellow eye in the past were also elicited with its duration, course and the treatment taken for the same. Apart from the clinical symptoms, a detailed history of the personal habits, occupation, past history, and treatment history were also observed. An elaborated questionnaire regarding the occurrence of any concurrent history along with the appearance of the first symptom was put forward. This included details of sleep, food habit, physical stress, emotional stress, alcoholism, smoking, any kind of drug intake related to any other systems of medicine, work pattern, hours of work per day etc. Similarly, a detailed past history of migraine, epilepsy, hysteria, acid peptic disease, COPD and ischaemic heart disease were also enquired into. Physician's opinion was sought in relevant cases regarding the systemic diseases. Apart from the tests described earlier to identify type – A behavior, psychiatrist's opinion was also sought whenever indicated.

Routine investigations have been done in all patients. After narrating the facts of the study, to each patient, blood group examination was also done in all patients.

**Statistical Analysis:** Data was entered in Microsoft Excel and analyzed using STATA version 14. Categorical variables were summarized as proportions. Duration of follow up was summarized as median with inter-quartile range. Association between categorical variables was done using chi square test of Fischer exact test. Statistical significance was defined as a P value of 0.05 or below.

#### Results

Total 35 patients were included in the present study. The demographic profile of study population was as shown in [Table 1]. The main victims of the disease were young people between 25 to 45 years. Among them also, the peak incidence was between 36 to 40 years of age. The male to female ratio was 2.9:1.

**Table 1: Demographic variables (Total N=35)**

Variables		N	%
<b>Age groups</b> Mean age: 35.31 years	20-25 years	01	2.86
	26-30 years	07	20.00
	31-35 years	09	25.71
	36-40 years	12	34.29
	41-45 years	05	14.28
	46-50 years	01	2.86
<b>Gender</b>	Male	26	74.30
	Female	09	25.70
<b>Laterality</b>	Right eye	14	40.00

	Left eye	19	54.30
	Both eyes	02	5.70
<b>Presenting symptom</b>	Defective vision	28	75.70
	Central scotoma	12	32.40
	Metamorphopsia	10	27.00
	Micropsia	02	5.40
	Photopsia	01	2.70
<b>Recurrences</b>	Recurrent cases	07	20.00
	Non-recurrent cases	28	80.00
<b>Range of visual acuity at the time of presentation (Total 37 eyes)</b>	6/6-6/12	19	51.40
	6/18-6/36	15	40.50
	6/60-5/60	03	8.10
	<5/60	00	00

Out of the 35 cases, 9 patients gave more than one specific concurrent history (one case had 3 and eight had 2) 18 patients gave single concurrent history; 8 patients had no concurrent history. [Table 2]

**Table 2: Concurrent risk factors and systemic associations**

Risk factors		N	%
1.	Insufficient sleep	20	54.0
2.	Insufficient food	01	2.7
3.	Physical stress	04	10.8
4.	Mental stress	04	10.8
5.	Alcohol	04	10.8
6.	Steroids	03	8.1
7.	Pregnancy	01	2.7
8.	NSAIDS	01	2.7
9.	Dapson	01	2.7
10.	B-Complex	01	2.7
11.	No specific history	08	21.6
12.	Acid peptic disease	13	37.0
13.	Migraine	04	11.4
14.	Type A behaviour	07	20.0
15.	Pregnancy	01	2.9
16.	Aphthous ulcer	03	8.6

In the present series of 35 patients, blood group testing was done in all patients. But 5 of them did not bring the proper records for the same at the time of review. Hence these patients are not considered for blood group analysis. Out of the 30 known cases of blood group, except for 2 cases, all other have positive Rh system.

The 2 cases of Rh negative system, (one O-ve and one A-ve) were included in the respective positive ABO system. The observations are as follows: [Table 3]

**Table 3: Distribution of ABO blood groups in study groups**

ABO blood groups	Number of eyes (N)	Percentage (%)
O	09	30.0
A	06	20.0
B	13	43.3
AB	02	6.7
Total	30	100

In the context of ABO system in Indian population, this study shows a most common incidence of B positive blood group in CSR patients. [Table 4]

**Table 4: Distribution of ABO blood groups in Indian population**

ABO blood groups	Percentage (%)
O	40.0
A	22.0
B	33.0
AB	05.0
Total	100

## Discussion

CSR usually occurs in the age group 20-50 years and is most common in males and manifest unilaterally. The pathogenesis of this disease is considered to be due to an abnormal hyper permeable state of the choroid which leads to the transudation of fluid producing a retinal and /RPE detachment.

In this study, the peak incidence of CSR was in the age group of 36-40 years; the mean age was 35.31 years. According to Yannuzzi et al, [1] Zweng et al, [2] Spaide RF et al [3], the mean age were 42, 41.6 and 51 respectively. Hence the present study shows the disease tends to occur earlier in Indians than in Japanese and Western people.

Bennett [4] and others from B and S Mehkri [5], Gilbert CM et al [6] showed a very high male to female ratio which varied largely from 4:5 to 10:1. But in a study conducted by Spaide RF, [3] Haas A et al [7] in 1996 reported that in recent years, the female proportions affected are much higher than in the past. In the present study, even though males are more seen to be affected than females, the male to female ratio is very much decreased to 2.9:1.

Even though many predisposing conditions and systemic associations of CSR like stress, Type A personality Migraine were described in the literature, what exactly trigger the occurrence of CSR; which is mostly acute in onset, is not enunciated. Among these precipitating conditions, the importance of physical and mental stress in the causation of CSR was emphasized by Bennett, [4] Gass [8] and Lipowski ZJ. [9] Its psychosomatic aspect was also supported by Fastenberg [10] and Yannuzzi LA. [1] There are reports of increased catecholamine level in the blood which have a role in the causation of CSR. This was shown by Yoshioka H et al [11] and Yasuzumi T [12] by creating animal models of CSR with intravenous epinephrine.

As there are specific blood group relations with certain systemic conditions like duodenal ulcer and carcinoma stomach, an attempt is made to search for any such constitutional relations exists among the patients of CSR. This is particularly because, CSR is considered to be an idiopathic condition without any known definite cause and because both CSR and duodenal ulcers are predisposed by the conditions of stress.

In this study out of the 35 patients, 30 cases had records to prove their blood groups. On analysis (Table 3), the most common incidence of blood group noticed in CSR patients was 'B' group which constituted 43.3% of the 30 cases. The incidence of 'B' group in general Indian population is only 33%. The 'O' group incidence in this study was 30%

where as that of Indian population comes about 40%.

At the same time, 'A' group and 'AB' group in this study does not reflect any significant difference with those of Indian general population.

Even though there is no data available from similar studies in this regard in the past, the above findings which showed a marked difference of 'B' group and 'O' group in CSR patients against that of Indian population, strongly suggests speculating that the incidence of CSR is high among individuals with blood group 'B'.

## Conclusion

Present study reflects a tendency of earlier occurrence of CSR in Indian people than Western people and does not affect the adolescents in the age group between 15-20 years. In present research, CSR is found to have a higher incidence among individuals with Blood group 'B'.

## References:

1. Yannuzzi LA, Shakin J, Fisher Y, et al: Peripheral retinal detachment and retinal pigment epithelial atrophic tracts secondary to central serous pigment epitheliopathy. *Ophthalmology* 91: 1554-1572., 1984.
2. Yap EY, Robertson DM. The long term outcome of central serous chorioretinopathy. *Arch Ophthalmol.* 1996; 114: 689-92.
3. Spaide RF, Campeas L: Hass A, et al: central serous chorioretinopathy in younger and older adults. *Ophthalmology* 103: 2070-2080, 1996.
4. Bennet G: Central serous retinopathy. *Br J Ophthalmol* 39:605-618, 1955.
5. Miki T, Sunada I, Higaki T: Studies on chorioretinitis induced in rabbits by stress (repeated administration of epinephrine). *Acta Soc Ophthalmol Jpn* 75:1037-1045, 1972.
6. Gilbert CM, Owens SL, Smith PD, Fine SL. Long term followup of central serous chorioretinopathy. *Br J Ophthalmol* 68:815-820, 1984.
7. Hirose I: Therapy of central serous retinopathy. *Folia Ophthalmol Jpn* 20: 1003-1034, 1969.
8. Gass JDM, Slamovits TL, Fuller DG, et al. Posterior chorioretinopathy and retinal detachment after organ transplantation *Arch Ophthalmol.* 1992; 110:1717-22.
9. Lipowski ZJ, Kiriakos RZ: Psychosomatic aspects of central serous retinopathy: A review and case report. *Psychosomatics* 12: 398-401, 1971.
10. Fastenberg DM, Ober RR: Central serous choriodopathy in pregnancy. *Arch Ophthalmol* 101: 1055-1058, 1983.
11. Yoshioka H, Katsume Y, Akune H: Experimental central serous chorio retinopathy

- in monkey eyes II: Fluorescein angiographic findings. *Ophthalmologica* 185: 168-178, 1982.
12. Yasuzumi T, Miki. T, Sugimoto K: electron microscopic studies of epinephrine choroiditis in rabbits. I: pigment epithelium and Bruch's membrane in the healed stage. *Acta Soc Ophthalmol Jpn* 78: 588-598, 1974.