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Original Research Paper

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DIAGNOSIS AND MANAGEMENT OF CENTRAL CEROUS RETINOPATHY BASED ON OPTICAL COHRENCE TOMOGRAPHY (OCT) FINDING

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ABSTRACT

Purpose: Diagnosis and Management of central Serous retinopathy Based On Optical Cohrence Tomography (Oct) Finding **Methods:** This was Prospective Interventional Study conducted in patients visiting the outdoor unit of Department of Ophthalmology, Maharani Laxmi Bai Medical College Jhansi, during the period of 12 months from January 2021 to January 2022. This study included patients with age above 21 years ,and those who were physically fit to undergo a dilated fundus examination and OCT evaluation. The study included 30 males (60%) and 20females (40%) that is there was male preponderance. 2. Majority of the patients were 31-50 years of age. 3. In this study the mean baseline Best corrected visual acuity eye affected with CSR is 0.95+0.351. 4. The follow up mean visual acuity BCVA as per log MAR eye affected with CSR at 1 month is 0.27+0.153 and The p value was less than 0.05 that is significant.5.The CMT assessed by SD-OCT for the comparison of mean central macular thickness and analysed the CMT thickness after treatment in 1 month, 3 months and 6 months follow up, the difference of mean CMT comes out to be statistically significant in mean central maculr thickness (μm). In our study baseline mean central macular thickness in affected eye with DME are 664.6+31.63 (μm) aand, At 1 month the follow up mean central macular thickness (CMT) thickness affected eye with CSR are 467.4+51.41(μm). After 3 months, CMT is 376.4±55.63 (μm), After 6 months of follow up the CMT is 299.3±47.20 (μm). The p value was significant **Conclusion:** Central serous retinopathy after treatment was assessed by improvement in mean CMT and mean BCVA, which correlated with each other. In this study intravitreal ranibizumab or bevacizumab treatment provides superior visual outcomes compared to conventional laser treatment. NSAIDS (NEPAFENAC and eyedrop brinzolamide) was effective .

KEYWORDS : central serous retinopsathy,anti VEGF.

INTRODUCTION

Central serous chorioretinopathy (CSCR) is a retinal disorder characterized by localized serous detachment of the macula with or without focal serous pigment epithelial detachment (PED). It is mostly seen in young men aged 20–45 years.[1] Albert V Graefe first described this condition as central recurrent retinitis in 1866. Bennet coined the term "central serous retinopathy," and Gass described the pathogenesis.[2] The patient complains of distorted images, the apparent small size of objects, and blurred vision. Most of the cases resolve spontaneously in 3-6 months.[3] For non-resolving cases, treatment includes laser photocoagulation and photodynamic therapy.[4-5] AntiVEGF and mineralocorticoid receptor antagonists have also been tried

Etiology

- Yannuzzi suggested a relationship between CSCR and type A personality[6]. These persons are aggressive, competitive, and have a sense of urgency. Such behavior causes catecholamine release, which increases choroidal permeability[7].
- Psychological stress and depression also predispose to CSCR[8].
- A definite association exists between CSCR and exogenous corticosteroid use[9-10]. It is generally associated with systemic intake, either oral or intravenous[11-12]. But studies have reported CSCR after nasal spray, topical skin creams, intra-articular, epidural, or periocular use[13].
- CSCR has also been reported following kidney, heart, and bone marrow transplantations[14-15].
- Increased endogenous cortisol production, such as Cushing disease and pregnancy, increases the risk of CSCR[16]. Steroid-effect might be an idiosyncratic response that affects vascular autoregulation.
- Drugs other than corticosteroids that have been associated with CSCR are
  - oral MEK inhibitors
  - phosphodiesterase inhibitors
  - pseudoephedrine

CSCR is the fourth most common retinal disorder threatening the vision.[17] Men are commonly affected. The male-female ratio was found to be 6:1 in a population-based study.[18] The mean age group is 39-51 years.[18-19] When females are affected, the age is usually higher than males. It is generally unilateral. However, bilateral involvement may be in up to 40% of cases.[19] However, the majority of cases have pigment epithelial detachment (PED) in the fellow eye also. Bilateral changes in the choroid are usually noted on optical coherence tomography (OCT)[20] and indocyanine green angiography (ICGA).[20] Kitzmann et al. found the incidence of CSCR to be 9.9 cases per 100,000 population.

Normally, the RPE keeps the retina in a dehydrated state by pumping out fluid from the subretinal space to the choroid. With the loss of polarity, the pumping reverses and fluid is directed towards the subretinal space. The non-perfusion in the choriocapillaris may lead to the widening of venous channels and increased hydrostatic pressure.[21] The mineralocorticoid receptor pathway has also been implicated.

Ancillary tests

OCT (optical coherence tomography)

This is the first line of investigation. The presence of subretinal fluid (SRF) is characteristic of CSCR. The resolution of SRF can be documented on serial OCT. Sometimes band-like fibrin deposits can be seen in the subretinal space.[22] Outer retinal dipping may be noted, which may touch the RPE or a PED.[23] The area of retinal dipping/sagging may denote the location of the leak.[23] In chronic CSCR intraretinal cystic changes, hyperreflective dots and elongated photoreceptor outer segments may be present. CSCR is currently considered as part of the pachychoroid spectrum. Thicker choroid has

been demonstrated on EDI OCT in eyes with CSCR and fellow eyes. Dilatation of outer choroidal vessels and thinning of choriocapillaris is present.[24-26] PED is commonly seen. It is contiguous to areas of choroidal hyperpermeability, as evident on ICGA. Sometimes a double layer sign can be seen in chronic CSCR.[27] However, this sign is typically seen in idiopathic polypoidal choroidopathy (IPCV). IPCV and CSCR constitute the pachychoroid spectrum and ICGA helps in differentiating the two. Tiny white dots may be seen in CSCR on ophthalmoscopy, which appear as hyper-reflective dots in the outer retina on OCT.

Fundus autofluorescence (FAF)

In acute CSCR, focal areas of hypo-auto fluorescence are seen that may correspond to the leak on FFA. In chronic CSCR, hyper-auto fluorescent tracks are present due to the accumulation of photoreceptor pigments.

Fundus fluorescein angiography (FFA)

Three types of fluorescein leakage patterns are seen in CSCR-inkblot, smokestack, and diffuse. In the inkblot pattern, pinpoint leakage occurs in the early phase, which then concentrically enlarges in the late phase. In smokestack pattern, the leakage starts as a pinpoint and gradually expands to form an umbrella-like (or tree-like) appearance. Inkblot pattern is more common. In the diffuse leak, there are multiple small/inconspicuous leaks in a localized area, which cause an increase in the size and intensity of the area of hyper-fluorescence. In chronic CSCR, patchy areas of hyper-fluorescence are seen corresponding to areas of RPE atrophy. Serous PED shows early hyper-fluorescence with a progressive increase in the intensity, but size remains the same.

Indocyanine green angiography (ICGA)

ICGA is helpful in imaging the choroidal vasculature. It shows hypocyanescence in the early phase denoting choriocap illaris nonperfusion and delayed filling. In mid-phase, hypercyanescence is seen, indicating choroidal vessel hyperpermeability. This hypercyanescence slowly fades in the late phase. These changes are bilateral. ICGA also helps in the detection of a choroidal neovascularized membrane (CNVM) in chronic CSCR, which may occur in up to 23% of cases[28].

1. Laser photocoagulation:

The RPE leakage sites, as seen on angiography, can be treated with laser photocoagulation. Such therapy seals the leakage point and hastens the resolution of subretinal fluid.[55] The thermal laser is indicated for extrafoveal leakage points. A green-wavelength laser produces a light gray scar over the focal RPE leak. Spot size is 100 micrometers, duration ≤0.1-second, and power ranging from 70-120 milliwatts is used.

2. Photodynamic therapy (PDT)

CSCR with a subfoveal leak, juxtafoveal leak, multiple leaks, and chronic cases with diffuse decompensation of RPE are better managed with PDT. PDT causes vascular remodeling of the choroid and choroidal hypoperfusion[29-30]. A drug called verteporfin is injected intravenously, which then reaches the eye. The verteporfin is activated by a laser on the source of leakage. This seals the RPE defect.

3. Anti-vascular growth factor (VEGF):

Anti VEGF therapy has been proposed to reduce choroidal hyperpermeability. They upregulate the tight junctions between endothelial cells and the reduction of vascular fenestrations[31-33].Various studies have reported the effect of bevacizumab, ranibizumab, and aflibercept on CSCR.

4. Anti-corticosteroids

5. Adrenergic blockers

MATERIALS AND METHODS:

This Prospective interventional study was carried out in Department of Ophthalmology, MLB Medical College over a period of 13 months.

Patients were included in the study under the following inclusion and exclusion criteria:

Inclusion Criteria:

- All patients of age > 21 years, with a confirmed diagnosis of central serous retinopathy on OCT or clinically and/or angiographically confirmed 2. Those who were physically fit to undergo a dilated fundus examination and OCT evaluation.

Exclusion Criteria:

- Pregnancy
- Dense media haze interfering with acquisition of good OCT image.
- Any other ocular pathology which can contribute to reduced visual acuity macular edema due to associated condition other than central serous retinopathy like central retinal vein occlusion,diabetic retinopathy etc, and those with OCT scans of poor quality will be excluded.
- Recent ocular surgery

Statistical Analysis:

Descriptive statistics included the mean and standard deviation for numerical variables, and the percentage of different categories for categorical variables.

RESULT

Table 1: Gender Distribution In Study

Sex	Number of patients	Percentage
Males	30	60%
Females	20	40%

Table 1 show that out of 50 patients, 30 (60%) were males and 20 (40%) were females. Our study showed male predominance.

Table 2: Age Distribution In Study Group

Age group	Number of patients	Percentage
21-30	06	12%
31-40	20	40%
41-50	15	30%
51-60	05	10%
61-70	04	8%

Number of patients in age group 21-30 year is 06(12%), and 31-40 year is 20(40%), 41-50 year is 15(30%), 51-60 year is 05(10%), and 61-70 year is 04(8%)

Table 3: Best Corrected Visual Acuity (bcva) In Affected Eye With Csr

BCVA	Number
Mean baseline BCVA	0.95
SD	+0.351

The mean baseline visual acuity BCVA as per logMAR in affected with CSR is 0.95+0.351

Table 4: Follow Up Bcva In Affected Eye With Csr At 1 Month

Mean BCVA (logMAR)	Mean baseline BCVA	4 week	p value
Mean±SD	0.95±0.351	0.27±0.153	0.002

Mean follow up BCVA right eye at 1 month was 0.274+0.153. The p value was <0.05 indicating that there was a significant difference in mean BCVA comparing to baseline .

Table 5: Follow Up Bcva In Affected Eye With Csr At 3 Months

Mean BCVA (logMAR)	Mean baseline BCVA	3 months	p value
Mean±SD	0.95±0.351	0.12±0.173	0.001

In this study the mean baseline visual acuity BCVA as per logMAR is 0.95±0.351 and mean visual acuity BCVA is0.12±0.173. The p value is 0.001 which is statistically significant .

Table 6: Mean Baseline Central Macular Thickness (μm) In Affected Eye With Csr

CMT	Number
Mean baseline CMT	664.6
SD	+31.63

The mean baseline central macular thickness (μm) in affected eye with CSR is 664.6+31.63.

Table 7: Follow Up Cmt In Affected Eye With Csr At 1 Month

Mean CMT	Mean baseline CMT	4 week	p value
Mean±SD	664.6±31.63	467.4±51.41	<0.05

In this study the mean baseline CMT is 664.6±31.63 and mean CMT is 467.4±51.41. The p value is less than 0.05 which is statistically significant.

Table 8: Follow Up Cmt In Affected Eye With Csr At 3 Month

Mean CMT	Mean baseline CMT	3 month	p value
Mean±SD	664.6±31.63	376.4±55.63	<0.05

Mean follow up central macular thickness (μm) in affected eye with CSR at 3 months was 376.4+55. 63The p value was significant.

In our study out of 50 patients 10(20%) taking anti-VEGF and 05(10%) patient taking laser and 05(10%) patient taking PDT and 20 (40%) patient taking carbonic anhydrase inhibitor and NSAIDS and 10(20%) patient ANTI steroid

DISCUSSION

Our study was conducted at MLB Medical College in the year January 2021 to January 2022 which included 50 patients who fulfilled the inclusion criteria. The present prospective interventional study was designed to compare the central macular thickness before and after treatment who have established central serous retinopathy .The study was carried out during the period of 08 months from January 2021 to January 2022 on patients coming to the outpatient department of Ophthalmology in M.L.B. Medical College, Jhansi. Diagnosis and Management of central serous retinopathy Based On Optical Cohrence Tomography Total number of 50 patients were enrolled for the study which were followed up and assessed over 08 months.

The results of this study are summarized as –

1. The study included 30 males (60%) and 20females (40%) that is there was male preponderance.
2. Majority of the patients were 31-50 years of age.
3. In this study the mean baseline Best corrected visual acuity eye affected with CSR is 0.95+0.351.
4. The follow up mean visual acuity BCVA as per log MAR eye affected with CSR at 1 month is 0.27+0.153 and The p value was less than 0.05 that is significant.
5. The CMT assessed by SD-OCT for the comparison of mean central macular thickness and analysed the CMT thickness after treatment in 1 month, 3 months and 6 months follow up, the difference of mean CMT comes out to be statistically significant in mean central macular thickness (μm).

In our study baseline mean central macular thickness in affected eye with DME are 664.6+31.63 (μm) and, At 1 month the follow up mean central macular thickness (CMT) thickness affected eye with CSR are 467.4+51.41(μm). After 3 months, CMT is 376.4±55.63 (μm), After 6 months of follow up the CMT is 299.3±47.20 (μm). The p value was significant.

CONCLUSION

Central serous retinopathy after treatment was assessed by improvement in mean CMT and mean BCVA, which correlated with each other.In this study intravitreal ranibizumab or bevacizumab treatment provides superior visual outcomes compared to conventional laser treatment. NSAIDS (NEPAFENAC and eyedrop brinzolamide) was effective

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