Original Research Article

Efficacy of Oral Eplerenone for the Treatment of Chronic Central Serous Chorioretinopathy

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Abstract

Background: Central serous chorioretinopathy is a sight threatening disease characterized by accumulation of serous sub retinal fluid occurs due to serous detachment of neurosensory retina and retinal pigment epithelium.**Purpose:** To evaluate the efficacy of oral Eplerenone in patients with chronic CSCR. **Methods:** In a tertiary care hospital, a prospective analysis of all the patients with chronic CSCR treated with oral Eplerenone who had been seen for at least three months were prospectively analyzed in a tertiary care hospital. Changes in CMT as measured by spectral-domain OCT served as the primary outcome. Changes in BCVA as measured by log MAR and the number of patients obtaining full resolution of SRF served as the secondary outcomes.**Results:** In 25 patients (15M /10F) treated with 25mg and 50mg of oral Eplerenone were included. The mean age of follow up was 21±17.6 wks. Mean CMT decreased from 401±133 to 317±75µm at 6 wks& to 285±68µm at 3 months. Mean height of SRF decreased from 157±113 to 78±89µm at 6 wks& to 51±79µm at 3 months. Complete resolution of SRF was found in 15 pts after 3 months. BCVA (log MAR) improved from 0.2±0.18 to 0.14±0.16 at 6 wks & to 0.07±0.13 in 3 months.
Conclusion: Eplerenone therapy may improve BCVA & decrease CMT and SRF height in pts with chronic CSCR.
Keywords: Chronic central serous retinopathy, Sub retinal fluid height, Sub retinal fluid diameter, Central macular thickness, Oral Eplerenone

Introduction

Central serous chorioretinopathy is a chorioretinal disease characterized by accumulation of serous sub retinal fluid causing serous detachment of neurosensory retina and retinal pigment epithelium [1, 2]. It occurs due to disruption of outer retinal barrier leads to accumulation of SRF. About' "one" in 10,000 people are affected by CSCR [3,4] with men being more frequently impacted than women. On the 'prevalence' of *CSCR,* minimal evidence is available [5, 6, 7]. The 'rate' is roughly 5.8 per 100,000 according to a population-based research done in 'Olmsted' County, "Minnesota". Additionally, different countries have different suggested *CSCR* practice routines [9,10] . Despite significant progress in modern years in ours comprehension of the anatomical traits and imagination aspects of the illnesses, the People experiencing the symptoms of *CSCR* are affected by fluid placement and volume. If the fluid is in the macular sparing area, patients may not exhibit any symptoms or may be asymptomatic however, signs like "dyschromatopsia" may be evident if the separation harms the central macula and results in central vision loss. The pathogenesis and aetiology of the CSCR disease are not fully known. High doses of corticosteroids, type A personality, obstructive sleep apnoea (OSA), abnormal coagulation, abnormal platelet aggregation, and pregnancy may all be the factors. The three main risk factors for the development of CSCR are excessive use of antibiotic, alcohol and oxidative stress.[11,12]

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Additionally, it is recognized that respiratory and allergic conditions also enhance the incidence of CSCR. Recently, SRD. In spite of the fact that CSCR has been linked to the indiscriminate use of steroids and phosphodiesterase-5 inhibitors like 'sildenafil' 'tadalafil' and 'vardenafil', hereditary predisposition appears to played a significant part in the pathogenesis of disease.[13] Although family CSCR instances have been reported in the literature, no specific transmission pattern or genotype has been connected to the disease [11]. In a recent study of five families, choroids in 50% of the eyes of relatives of CSCR patients were 'thicker than 395 µm indicating that "pachychoroid" may be one of the phonotypical indicators and that CSCR may be inherited with a potential dominant transmission pattern in older people with more bilateral and female CNV prevalence. A dilated fundus examination, OCT, FFA and ICAG are used to photograph the retina and make the diagnosis Of CSCR.[11, 14]

Newly presented instances of CSC typically resolve spontaneously in 2 to 3 months, therefore 'Although' family *CSCR* instances have been reported in the literature, no specific transmission mechanism or genotype has been connected to the disease [9] . Historically, instances with chronic fluid and visual loss were treated with thermal (ARGON) laser photocoagulation and micro pulse diode lasers.[15] Instead of evidence from randomised clinical trials, the rationale for utilising this therapy was mostly based on tiny or constrained case study . The patho -physiologic basis for or result of using a thermal laser was also unclear. Subsequently, Based on a few small randomised trials, verteporfin photodynamic therapy (PDT) employing 'half-dosage usual dose 30-ml over ten minutes' then 'administer a laser at 689 nm for fifteen minutes, total light energy 501mW/cm2 intensity 600mW/cm2" regimen was recommended as a viable therapeutic approach.[13] The neuroretina expresses 'mineralocorticoid receptors' and over-activation of these receptors

may encourage neovascularization of the retina.[6] Recently, the possible therapeutic use of oral eplerenone a 'competitive antagonist to MRs' for patients with a persistent CSCR has drawn attention to the use of 'mineralocorticoid antagonists'. The use of mineralocorticoids would seem to make pathophysiologic sense because it is known that they have an effect on the choroidal vasculature. "Eplerenone" is a 'mineralocorticoid receptor antagonist. Eplerenone has good MR selectivity and functions as a competitive antagonist. In this research, we observed the effectiveness of the oral Eplerenone in CSCR patients.

Materials & Methods

This was a Comparative Prospective study done in tertiary care hospital, Darbhanga Medical College, Bihar, India from January 2021 to December 2021. This study was Conducted in accordance with the tenets of the declaration of Helsinki and was approved by departmental research committee.

Inclusion criteria

- Patients who were taking 'eplerenone' at doses of '25 or 50 mg/dl' were included in the study.
- All patients ≥18 years of age and less than 55yrs were included.

Exclusion criteria

- Key of exclusion criteria include subject who had Retinal vascular disease, h/o RVO, DR, Exudative ARMD, DME.
- Patients age less than 18 years were excluded.

Written informed consent was obtained from all the participants after explaining the procedure. Patients who enrolled in the 'OPD' at the DMCH Bihar were chosen systematically. Participants in the initial screening and baseline procedure's that included a full medical history, complete eye examination and a blood test. At each follow-up, the patient's history of any negative events was reviewed and noted. No patients dropped out during the course of eplerenone treatment. The primary outcome included 'SRF height' and SRF diameter and central macular thickness (CMT). The outcomes were analysed by using SD-OCT imaging. The secondary outcome was changes in BCVA recorded in log MAR and number of patients achieving complete resolution of SRF.

Statistical Analysis

All the data were noted on MS Excel sheet and analysed using SPSS 21.0 package's (SPSS Inc., Chicago, USA). Due to the prospective nature of the study, the time pd's after the beginning of therapy were divided into 4 frames: 'baseline' 6 wks, '12 wks', and more than '12 wks+. Differences of CMT and differences of BCVA (Snellen's VA at 6m was converted into logMAR) were calculated with independent t-test. Result's of the analysis were evaluated under 95% C.I's and mean values as mean± SD. The p value <0.05 was considered as statistically significant.

Results

In 25 patients, (15M /10F) treated with 25mg and 50mg of oral Eplerenone were included. The mean age of follow up was 21±17.6 wks Oral eplerenone at doses of (25 or 50 mg/d) was given for an average of 3 months in all 25 pts with CSCR. The median patient age was 52 years with a range of 20 to 55 years. In the study, there were 15 men (60%) and 10 women (40%). There were 1.5 men for every woman. It demonstrates a male predominance. (Table 1)

Table 1: Frequency of Distribution of Gender

Gender	Frequency	Percentage
Male	15	60%
Female	10	40%
Total	25	100%

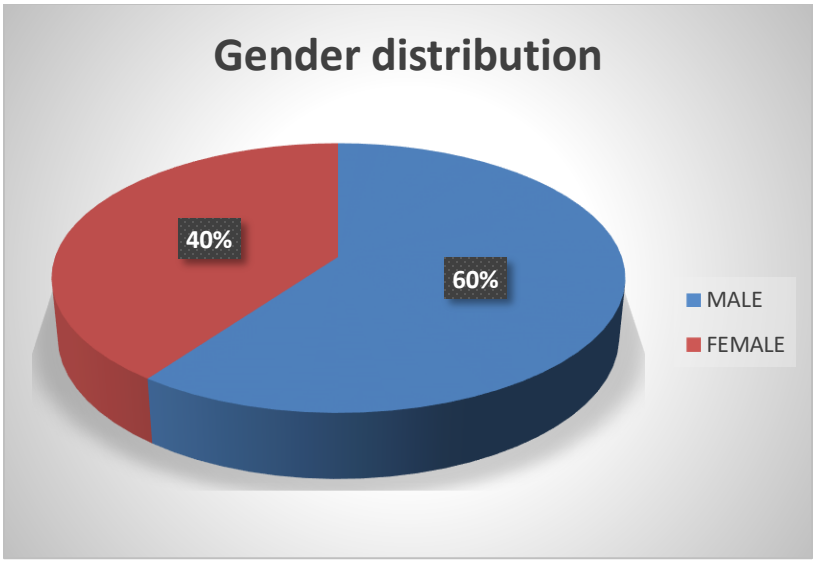

Fig 1: Distribution of gender

The Mean height of SRF decreased from 157±113 to 78±89 µm at 6 wks & to 51±79µm at 12 wks and 43±83µm after 12 weeks. Complete resolution of SRF was found in 21 patients after 3 months of treatment. The mean best corrected visual acuity at baseline (log MAR) improved from 0.2±0.18 to 0.14±0.16 at 6 wks & to 0.07±0.13 in 12 weeks and 0.05±0.21 after 12 weeks of follow-up. Visual acuity increases over time on log MAR chart from 0.2±0.18 to 0.15±0.21 and p-value was significantly increased from 0.043 to 0.026. It showed eplerenone were effective in treatment of chronic CSCR.

The Mean CMT decreased from 401±133 to 317±75µm at 6 wks & to 285 ± 68µm at 12 weeks and 253±47µm after 12 weeks of time interval. The p-value increases from 0.048 to 0.036 which is significant. So eplerenone may be effective in treatment of chronic CSCR. The differences between baseline and post oral eplerenone treatment status of SRF HT, BCVA, CMT were shown in (Table 2, 3 & 4).

Table 2: Mean SRF HT on follow-up

Time Interval	Mean SRF HT (µm)	p- Value
Baseline	157±113	
6wks	78±89	0.024
12wks	51±79	0.023
12+wks	43±83	0.002

*SRF HT- Sub retinal fluid height, *SD- Standard Deviation

Table 3: Mean BCVA on log MAR

Time Interval	Mean (SD) Log Mar	P-Value
Baseline	0.2±0.18	
6wks	0.14±0.16	0.048
12 wks	0.07±0.13	0.042
12 wks+	0.05±0.21	0.026

*BCVA- Best Corrected Visual Acuity, *SD- Standard Deviation

Table 4: Mean CMT on Follow Up

Time Interval	Mean CMT (µm)	p- Value
Baseline	401±133	
6wks	317±75	0.048
12wks	285±68	0.042
12+wks	253±47	0.036

*CMT- Central Macular Thickness, *SD- Standard Deviation

Safety Analysis

Ocular and nonocular adverse events (AE's), (SAE's), complete eye examination and systemic examination was done and all information was collected and summarized in order to determine safety. The use of epleren one did not lead to any significant incidents.

Discussion

A group of patients with chronic CSCR who were given oral eplerenone 50 mg a day showed statistically significant decreases in both SRF height and diameter as well as decreased CMT and improving VA. The CMT at the first follow-up period considerably decreased by 10% from baseline. Log MAR, CMT, horizontal SRF diameter, and vertical SRF height all showed statistically significant declines (P=0.024, P=0.023, P=0.002, and P=0.007, respectively). on the basis of above finding that oral eplerenone effective in the treatment of CSCR and it may gold standard chronic instances, it, it may be more advantageous than earlier CSCR therapy techniques such focused laser photocoagulation or PDT[2],[5],[12]. PDT''s was not much more effective than treating acute CSCR than recurrent or chronic CSCR [13]. In addition, oral eplerenone is less invasive than anti-VEGF injections and laser therapy needs more study to confirm these results because of the small sample and lack of placebo control . recurrence is also challenging. Eplerenone was effective in acute cases and better prognosis. Evaluating efficacy requires a large sample size and control group, including patients as self-reported controls (both before and after therapy). A number of patients were treated with eplerenone right way at the time of their initial meeting, knowing that they had chronic or acute a notes from other doctors, according to this cohort's data prior to receiving eplerenone treatment were noted,for dose administration to assess the effectiveness of the investigational medication. The variability in eplerenone dosage was one way that the current investigation differed from the original trial by Bosquet et al.[2]. Following confirmation of the condition, doctors in this trial provided oral eplerenone at doses of 25 mg/d or 50 mg/d. Four of the thirteen patients initially received oral eplerenone 25 mg/d; however, in the middle of the research, they were switched to 50 mg/d. Six of the thirteen patients started and kept receiving oral eplerenone at a dose of 50 mg/daily, while the other three patients started and continued receiving oral eplerenone at a dose of 25 mg/daily. All 13 cases in the Bousquet et al[2] case series Similar significant results were obtained in case reports by Zhao et al. [4] that employed the same dose regimen as Bousquet et al. [2]. In fact, they found that CSCR symptoms had not returned up to 5 months after the end of medication treatment. Therefore, more study is necessary to determine the ideal eplerenone dosage and therapy time for chronic CSCR. It is significant to note that the study lacked an exact record of the date of the initial diagnosis because doctors at the study site frequently consult patients from other doctors, introducing referral bias into this cohort. However, the referring doctor's confirmation that the patient has persistent CSCR or acute and take the decision to treat these individuals with eplerenone. Despite fluorescein angiography being conducted to confirm the condition before participation, fluorescein leakage was not evaluated in this trial before and after treatment. We were also unable to evaluate the long maintenance period for eplerenone recurrence of SRF after stopping eplerenone medication due to the limited sample size and retrospective nature of the study. In this study, eplerenone, a mineralocorticoid receptor antagonist was investigated as a potential treatment for chronic CSCR. Eplerenone therapy for chronic CSCR aimed to lessen or eliminate foveal SRF while enhancing visual results. Following treatment, sub retinal fluid levels, CMT and chronic CSCR all significantly decreased and improved VA.

Conclusions

Eplerenone therapy may improve BCVA & decrease CMT and SRF in patients with chronic CSCR.

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