

Comprehensive Therapy for Subfoveal Choroidal Neovascularization Secondary to Multifocal Choroiditis

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Abstract: To report the clinical effect of comprehensive therapy in patients with choroidal Neovascularization (CNV) secondary to Multifocal Choroiditis (MC). About 12 eyes of 10 patients (8 females and 2 male, mean age 43.5 ± 9.7 years) were included in this retrospective noncomparative consecutive case series study. The mean follow-up time was 14.8 ± 3.7 months. All the eyes received comprehensive therapy including Photodynamic Therapy with verteporfin (PDT) and intravitreal injection of Ranibizumab/Bevacizumab and/or oral steroid. Baseline of Best-Corrected Visual Acuity (BCVA) on standard Early Treatment Diabetic Retinopathy Study (ETDRS) chart, the mean CNV area and Central Retinal Thickness (CRT) were compared with the results of last visit. Initial BCVA ranged from 20/250-20/50 (mean logMAR 0.62 ± 0.51) and improved to 20/200-20/20 (mean logMAR 0.49 ± 0.42) ($p = 0.06$). By the end of last visit three eyes (25%) had gained at least 1.5 lines, 1 eyes (%) had lost 1.5 or more lines and no patient lost 3 or more lines of visual acuity whereas 8 eyes remained stable. Mean CNV area was 0.726 ± 0.384 mm² at baseline and had a slight reduction to 0.627 ± 0.258 mm² ($p > 0.05$). The central retinal thickness also had a decrease from 370.9 ± 58.7 μ m at baseline to 249.3 ± 42.4 μ m by the end of this study ($p > 0.05$).

Key words: Choroidal neovascularization, multifocal choroiditis, photodynamic therapy, intravitreal injection, China

INTRODUCTION

Multifocal choroiditis is a relatively uncommon inflammatory disease with a wide range of clinical manifestations and clinically defined entity of multiple punched-out chorioretinal spots associated with clinically evident intraocular inflammation. MC frequently affects young myopic females and Choroidal Neovascularization (CNV) (Vianna *et al.*, 2004) is the most frequent cause of visual loss, accounting for one third of all cases (Slakter *et al.*, 1997; Brown *et al.*, 1996; Reddy *et al.*, 1996; Morgan and Schatz, 1986).

Recent studies have demonstrated that Photodynamic Therapy (PDT) with verteporfin and intravitreal injection of Ranibizumab or Bevacizumab may be beneficial in stabilizing visual acuity in cases with CNV secondary to multifocal choroiditis (Spaide *et al.*, 2002; Parodi *et al.*, 2004; 2006; Troutbeck *et al.*, 2012). The purpose of this study was to report the experience with comprehensive therapy in CNV associated with MC in a group of ten patients.

MATERIALS AND METHODS

Patients: Researchers conducted a retrospective analysis of cases of MC treated with PDT based comprehensive therapy that researchers previously diagnosed from May 2010 to September 2011. The diagnosis of MC was based on the following features: detection of multiple chorioretinal lesions, ranging in size from 50-350 μ m situated in the posterior pole and/or the periphery and/or atrophic, punched out with variable pigmentation in the advanced stage; variable quantities of vitreous cells; possible presence of signs of anterior uveitis and possible presence of peripapillary changes, atrophy or depigmentation (Morgan and Schatz, 1986). Each patient underwent assessment of the BCVA on standard ETDRS, general ophthalmic examination including refraction, slitlamp biomicroscopy indirect ophthalmoscopy and fluorescein angiography and Optical Coherence Tomography (OCT). Photodynamic therapy was performed according to the standard protocol followed in the treatment of age-related macular degeneration with Photodynamic Therapy (Anonymous, 1999) study group

investigation. About 3 days after PDT intravitreal injection were performed. Among those 7 cases received Ranibizumab while 5 cases received Bevacizumab. Of the ten patients 5 received oral corticosteroid as a supplement therapy. All four patients had signs of active inflammation such as: inflammatory cells in the vitreous, fluorescein leakage on FFA at late stage at the time of initial evaluation in the office. All patients were scheduled to return 3 months after the treatment although, some were seen much sooner because of their intraocular inflammation. At each of the regularly scheduled follow-up visits, assessment of the BCVA on standard ETDRS, ophthalmoscopic examination, color fundus photography and fluorescein angiography and optical coherence tomography were performed. Decrease in visual acuity was considered to have occurred if there was a doubling of the visual angle. Then, repeated PDT and intravitreal injection was recommended.

Statistical analysis: The collected data included age at presentation sex affected eye and the date of the initial diagnosis. Visual acuities before PDT at post-treatment follow-ups and at the final visit were recorded. Statistical analysis for descriptive statistics was performed using SPSS Statistical Software (Version 12.0). Differences between groups were analyzed by paired sample t-test.

RESULTS AND DISCUSSION

Eight females and two males were treated with PDT combined with intravitreal injection of anti-VEGF due to subfoveal CNV secondary to MC. All patients were Chinese. Their age ranged from 25-54 years old (mean 43.5 ± 9.7 years). Follow-up time ranged from 7-24 months (mean 14.8 ± 3.7 months). All the lesions were predominantly classic CNV with no occult features. Subretinal hemorrhage was visible in 8 eyes. Five patients with active MC were treated with oral steroids for 3 months at the time of combined treatment. And what is more two of them received additional subtenon injection of steroids. The CNV area was $0.726 \pm 0.384 \text{ mm}^2$ at baseline and $0.627 \pm 0.258 \text{ mm}^2$ at the last visit ($p > 0.05$).

At the 3 months examination, 2 eyes with a decrease of visual acuity showed CNV progression with an increase of the mean value of the area. And repeated treatment were recommended and performed. The mean central retinal thickness was $370.9 \pm 58.7 \mu\text{m}$ at diagnosis and decreased to $249.3 \pm 42.4 \mu\text{m}$ at last visit ($p > 0.05$). And at the 3 months examination, the 2 eye with CNV progression also showed an increase of central retinal thickness. On OCT macular cystoid edema and retinal edema were detected, respectively. Another patient

showed a slight CNV leakage on FFA and serious retinal detachment on OCT. And retreatment was recommended to these three patients but refused.

At the last visit these lesions keep stable and did not show any more progress. In the current report researchers found that treated with PDT and intravitreal injection of anti-VEGF for subfoveal CNV secondary to MCP, 3 eyes (25%) had gained >3 lines, one eye had lost 1.5 line and no eyes lost <3 lines of snellen visual acuity whereas 8 eyes (66.7%) showed <1.5 line change. Meanwhile, the mean CNV area showed a decline from 0.726 mm^2 at baseline to 0.627 mm^2 at the last visit. Moreover, the central retinal thickness decreased from $370.9-249.3 \mu\text{m}$. Except two eyes, all the other seven eyes showed both reduction of CNV area and central retinal thickness.

The approach to CNV associated with MC may include several options. PDT appears to be a viable therapeutic option for subfoveal CNV secondary to multifocal choroiditis. Parodi *et al.* (2004, 2006) and his colleagues reported that PDT could stabilize VA and reduce the mean CNV area in patients with subfoveal or juxtafoveal CNV caused by MC. Recently, they (Parodi *et al.*, 2010) reported a better outcome of visual acuity of intravitreal bevacizumab treatment than PDT in MC CNV. But repeated injection is a obvious shortcoming because this could increase the risk of infection and retinal artery occlusion and stroke in the elder.

The combination of PDT and intravitreal injections of anti-VEGF and/or oral steroid seems to lead to a promising result. Lately Ehrlich *et al.* (2010) reported that all three patient of CNV associated with MC who were treated with the combination of PDT and oral steroids had improved visual acuity with final visual acuity of 20/40 or better. In addition, Fong *et al.* (2008) also reported their results in 5 patients with PIC with a mean age of 30 years treated with systemic steroids and PDT and found a mean improvement of 9 letters with only 1 eye having a decrease in VA. As the low-grade inflammation could be the trigger of uveitic neovascularization (Espinosa-Heidmann *et al.*, 2003), it is supposed that PDT combined with treatment of anti-VEGF and/or with systemic corticosteroids presents a more favorable outcome with less number of intravitreal injections (Tran *et al.*, 2008).

CONCLUSION

Combined therapy of PDT and intravitreal injection of anti-VEGF and/or oral steroid can stabilize visual outcome in patients with CNV secondary to MC.

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