PHOTODYNAMIC THERAPY IN SEVERE CHRONIC CENTRAL SEROUS CHORIORETINOPATY

TERAPIA FOTODINÁMICA EN CORIORRETINOPATÍA SEROSA CENTRAL CRÓNICA SEVERA

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ABSTRACT

Objective: To determine the efficacy of Photodynamic Therapy (PDT) in chronic Central Serous Chorioretinopathy (CSC).

Methods: Patients diagnosed with chronic CSC, with clinical evidence of activity and treated with Photodynamic Therapy, are included in this report. All were assessed by a complete ophthalmological examination, including assessment of the best corrected visual acuity (BCVA) using an ETDRS chart, fluorescein and indocyanine angiography and optical coherence tomography (OCT). The main objective of the study was to determine the mean visual acuity change.

Results: 11 eyes of 11 patients were included in the study, which had a mean follow-up period of 11 months. The mean BCVA increased from 20/76 to 20/64. 35% of eyes improved their BCVA by 2 lines or more, 45% remained stable and 18% lost 2 lines or more. Choroidal hyperpermeability was reduced in every case. Neurosensorial retinal detachment decreased in 80% of cases. Only one eye received a second PDT treatment due to choroidal neovascularization. An increase of atrophy over the Retinal

RESUMEN

Objetivo: Determinar la eficacia y seguridad de la terapia fotodinámica en coriorretinopatía serosa central crónica (CSC)

Métodos: Se incluyen pacientes con formas crónicas de CSC y signos de actividad de la enfermedad tratados con terapia fotodinámica. Se lleva a cabo una exploración oftalmológica completa incluyendo la medida de mejor agudeza visual corregida (MAVC) en optotipo ETDRS, angiografía con fluoresceína (AFG) y verde de indocianina (AVI) y tomografía de coherencia óptica (OCT). El objetivo primario del estudio es determinar el cambio medio en agudeza visual.

Resultados: Se han incluido 11 ojos de 11 pacientes. La MAVC media ha pasado de 20/76 a 20/64. El 35% de los ojos mejoraron su MAVC en dos o más líneas, en el 45% se mantuvo estable y el 18% perdieron dos o más líneas. En todos los casos se redujo la hiperpermeabilidad coroidea y en un 80% el desprendimiento de retina neurosensorial. Todos los pacientes recibieron un solo tratamiento salvo un caso que requirió dos por la aparición de una neovascularización coroidea (NVC). En otro caso
Pigment Epithelium (RPE) was observed in another patient.

Conclusions: PDT can reduce the clinical signs of activity, such as choroidal hyperpermeability or neurosensorial retinal detachment, in patients affected by chronic CSC. However, the increase in visual acuity is variable, probably due to the extent of RPE damage (Arch Soc Esp Oftalmol 2008; 83: 9-14).

Key words: Photodynamic therapy, chronic central serous chorioretinopathy, optical coherence tomography, indocyanine green angiography, choroidal hyperpermeability.

INTRODUCTION

Traditionally, central serous chorioretinopathy (CSC) has been considered an idiopathic disorder of the retinochoroidal barrier, characterized by a serous detachment of the neurosensory retina due to the passage of liquid through the retinal pigmentary epithelium (RPE) (1).

In most cases it is considered to be a benign disorder which occurs more frequently in young males and evolving with spontaneous resolution and visual recovery. In some cases, it evolves into a recurring form with outbreaks appearing in time, in which case it is considered sub-acute CSC (2).

However, 5% of cases suffer severe visual loss due to the progressive involvement of the RPE. This is a form of disease, called chronic CSC, which usually affects elderly patients. It is characterized by exhibiting in exploration patched RPE atrophy areas with changes in the distribution of pigment and areas of retina pigmentary epithelium detachment. In addition to its chronic nature, it evolves with exacerbations and remissions, with the final visual prognosis being poor (3).

Several authors have utilized photodynamic therapy (PDT) in the treatment of subacute and chronic CSC on the basis of the reduction of choroidal permeability observed after the administration of said treatment (4). The results obtained exhibit significant variations.

The objective of this paper is to assess the change in VA of patients with chronic and severe forms of active CSC treated with PDT. Secondary objectives are to assess the number of necessary re-treatments with PDT for a mean follow-up period of approximately one year, as well as the angiographic and tomographic changes observed after PDT.

SUBJECTS, MATERIAL AND METHODS

The study comprised eleven eyes of eleven patients with chronic CSC with signs of recent activity. The inclusion criteria were: patients with chronic CSC, understanding as such the presence of a significant damage in the RPE, particularly at the subfoveal level (evidenced by retinography or FAG) which also exhibited signs of exacerbation or activity of the process, such as choroidal hyperpermeability in angiography with indocyanine Green (AIG) or presence of neurosensorial retinal detachment or RPE in optic coherence tomography (OCT) (fig. 1).

Sub-acute forms in which the RPE was not significantly affected have been excluded from the study, together with chronic forms which did not exhibit signs of activity. Likewise, we excluded patients who had contraindications for the administration of PDT as well as those who exhibited in exploration a susceptibility to choroidal neovascularization (CNV).

The ophthalmological exploration included: determination of best corrected visual acuity (BCVA) according to the ETDRS optotype, retinography, angiography with fluorescein and indocyanine green as well as Optic Coherence Tomography (OCT). said exploration was carried out before and
after the treatment with PDT and at three-month intervals thereafter.

The PDT was administered in accordance with the usual parameters with an infusion of verteporfin (Visudyne, Novartis, Basel, Switzerland). The spot size was determined on the basis of the choroidal permeability increase area found in the AIG.

In all cases a PDT session was carried out at the beginning of the study and at three-month intervals, assessing in each the need for retreatment.

### RESULTS

The study included eleven eyes of eleven patients, seven men and seven women. The mean age was of 53.2 years (range, 42-63 years).

The initial mean visual acuity was of 20/76 and the final of 20/64, 36.3% of all eyes (4/11 eyes) improved their visual acuity in one or two lines while 45.5% (five eyes) remained stable and 18.2% (two eyes) lost two or more lines of visual acuity.

All the patients exhibited severe RPE damage at the subfoveal level as well as a belated leak of contrast evidenced in the FAG. In addition, in three cases (27.3%) we observed a localized leak point. After the administration of PDT, said localized leak point was attenuated in all three cases (figs. 2 and 3). There was no improvement in the alteration of RPE or the belated contrast leak.

The choroidal hyper permeability plates evidenced in mean AIG times present in all eyes improved after the administration of PDT in 100% of eyes (figs. 4 and 5).

In what concerns the findings of the OCT, all the eyes of the study exhibited an area of neurosensory retinal detachment. In 63.6% of cases the irregularity of the external segment of the photoreceptors layer was evident, while 27.3% exhibited associated RPE detachment areas and 36.4% had hyper-reflecting areas (fibrin deposits) within the neurosensory retinal detachment.

After the administration of PDT, the neurosensory retinal detachment resolved in nine of the eleven patients (80%). However, the irregularity in the photo-receptor layer or the RPE detachment did not exhibit significant changes (fig. 5).

Three months after the PDT, one patient (9.1%) exhibited a classical small size NVC, which required a second PDT session, with the spot localized exclusively in the NVC area.
No other patient received a second session of photodynamic therapy.
The mean follow-up was of 11 months (range 8-19).

**DISCUSSION**

In most cases, CSC has a benign course with low repercussion on final visual acuity and positive prognosis without requiring treatment. Occasionally, outbreaks of activity of the disease may adopt a recurrent course or fail to resolve spontaneously in a few months. These are recurrent or persistent subacute forms.

However, there is a group of patients (generally older and with a longer course of the disease) for whom the visual prognosis is a lot worse due to the progressive damages produced in the RPE. In this regard, the concept of chronic CSC is associated to a significant damage of RPE instead of a chronological concept of evolution of the disease.

Several authors (5-8) have treated subacute or chronic forms of the disease with PDT, obtaining a variety of results. However, it is necessary to mention an important limitation in all the studies about chronic CSC made to date, because the criteria for considering a CSC as chronic are not universally accepted or founded on objective findings. In our study we have included patients with severe involvement and subfoveal localization of the RPE on the basis of the retinographic image, the AFG and OCT. In addition, said patients exhibited signs of activity or exacerbation of the disease such as choroidal hyper-permeability of neurosensory retinal detachment in the OCT, susceptible of improvement with the administration of PDT.

The introduction of AIG has evidenced the existence of choroidal hyper-permeability plates with liquid leaks to the extravascular space in patients with CSC. This finding has changed in part the traditional theory that CSC originates in a localized dysfunctional point of the PRE, pointed out by AFG.

In this regard, there is a certain controversy about the size of the spots and the most adequate test for guiding the treatment with PDT.

Some authors treat small spots on the basis of the AFG leak point. According to this theory, it is not necessary to treat as per AIG because choroidal hyper-permeabilization can also appear in areas in which the retinographic and angiographic results are apparently normal (5).

Still other studies guide PDT following the findings of the AIG for treating the process at the physiopathological level in the understanding that the disease originates in choroidal hyper-permeabilization and not in the RPE localized dysfunction (7).

In our case, we have selected the size of the PDT spot on the basis of the choroidal hyper-permeabilization plate shown by the AIG, because said finding was constant in all the eyes whereas the existence of leak points in AFG was highly infrequent.

As regards visual results, the mean visual acuity did not experience significant changes in our series. The percentage of patients who exhibited improvements was of 35%. In other series, this percentage is highly variable, for example the series of Yanuz-
zi (7) with 30% (6/20 eyes) and 100% of Taban’s series (5) (5/5 eyes). As commented above, the inclusion criteria of patients varied from one study to another, and accordingly the degree of severity of the disease. This has led some to suggest that the visual improvement is more foreseeable in patients having less severe RPE damages.

In relation to the findings of the image tests, there is a greater consensus in literature. Our series documents neurosensory retinal detachment resolution in the OCT in 80% of eyes, a number which is closer to the 60% of Yannuzzi (7) or the 100% of Taban (5).

Similarly, the choroidal hyper-permeabilization reduction in all the cases of our series is a finding shared by said authors. Chan’s series (6) demonstrated a reduction in the diameter of dilating choroidal vessels from 546 to 371 microns, with reduction in leaks to the extravascular space.

Two cases of our series lost two lines of vision. In one of these, we verified the development of choroidal neovascularization after the administration of PDT. The appearance of CNV has been described in between 4 to 8% of CSC cases (2), as a consequence of the RPE disruption. In addition, a similar case was described in Chan’s series (6), in which it is speculated that CNV can also appear as a result of localized ischemia in the choriocapillary induced by PDT. In the above study CNV resolved spontaneously but in ours it stabilized after a second PDT session and it was localized only in the CNV area.

Another patient lost visual acuity even though the appearance improved in AIG and OCT. However, in this case we observed in the retinography and AFG a significant increase in the RPE atrophy after the administration of PDT. This negative effect of PDT over RPE has been described previously (9). For this reason, some authors have proposed reducing the PDT dosage in order to reduce toxicity over the RPE (10).

In conclusion, it can be said that the administration of PDT in patients with chronic CSC improves particularly the signs of activity of the disease such as choroidal hyper-permeabilization or neurosensory retinal detachment. However, improvements in visual acuity seemed more dependent on the condition of the RPE.

The presence of potential complications makes it necessary to adopt certain precautions when administering this treatment. Additional studies are necessary with longer follow-up periods in order to verify the above results and resolve some of the issues discussed above.

REFERENCES