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CASE REPORT

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Topical cyclosporine A 0.1% for treatment of corneal subepithelial infiltrates in a 15-year-old patient

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ABSTRACT

We present a case of a 15-year-old female patient with multiple corneal opacities of the left eye secondary to epidemic keratoconjunctivitis a year earlier. Due to the elevated intraocular pressure on topical steroid therapy, cyclosporine A eye drops were started. The visual acuity improved from 0.2 to 1.0 and remained stable during 3-year follow-up. No side effects were noted. The regression of corneal subepithelial infiltrates was monitored by anterior segment optical coherence tomography imaging.

KEY WORDS: corneal subepithelial infiltrates, nummular keratitis, steroid responder, cyclosporine A, anterior segment optical coherence tomography, AS-OCT.

INTRODUCTION

Epidemic keratoconjunctivitis (EKC) is an ocular infection most commonly caused by adenovirus serotypes 8, 19, 37, 53 and 54 [1]. In some cases, EKC may be characterized by a mild and self-limiting course. However, if the virus replicates in the corneal epithelium, which is manifested as punctate keratitis, this leads to the gradual development of subepithelial infiltrates located in the anterior part of the corneal stroma. Clinically observed corneal opacities can become chronic or recurrent, significantly worsening visual acuity for months or even years [1, 2]. To restore corneal translucency, topical glucocorticosteroids are recommended as a standard treatment modality, but clinical improvement is not always achieved. Moreover, in predisposed patients (so-called steroid responders), they may induce an increase in intraocular pressure. In such cases, eye drops with cyclosporine A provide a more preferable therapeutic approach [3-6].

CASE REPORT

In January 2017, a 15-year-old female patient presented with her parents to the ophthalmology outpatient clinic at the Department of Ophthalmology, Poznan University of Medical Sciences. The main complaint was significant deterioration of vision in her left eye (LE) resulting from multiple corneal opacities after epidemic keratoconjunctivitis which occurred a year before. At the local outpatient clinic, an attempt was made to treat the lesions by prescribing eye drops with 0.1% dexamethasone 5 times a day. However, since the patient developed a significant increase in intraocular pressure (up to 47 mmHg) within just a few days of the treatment, it was discontinued, and the patient was referred to our Department for consultation.

In the ophthalmic examination, the distance visual acuity (VA) of the right eye (RE) was 1.0 sc, and of the left eye (LE) – 0.2 sc. The near VA was 0.5 sc and 1.0 sc in the right and left eye, respectively. The correction did not improve her vision in the LE. The intraocular pressure was 15 mmHg in the RE, and 21 mmHg in the LE. The anterior segment of the right eye was normal, but in the left eye the multiple round corneal opacities were shown (Figure 1A). Optical coherence tomography depicted hyperreflective subepithelial lesions reaching even up to half of the corneal stroma thickness (Figure 1A). Dilated fundus examination revealed bilateral optic disc drusen.

In view of the patient's medical history, treatment with steroid eye drops was contraindicated. Consequently, topical application of 0.1% cyclosporine 4 times a day was recommended and a commercially available ready-to-use product was prescribed. After 2 months of treatment, the patient's visual acuity in the LE improved to 0.4 sc (no improvement with correction), and the depth of inflammatory corneal infiltrates decreased (Figure 1B). The therapy with cyclosporine 4 times a day was continued, and further gradual regression of lesions was observed over time until their com-

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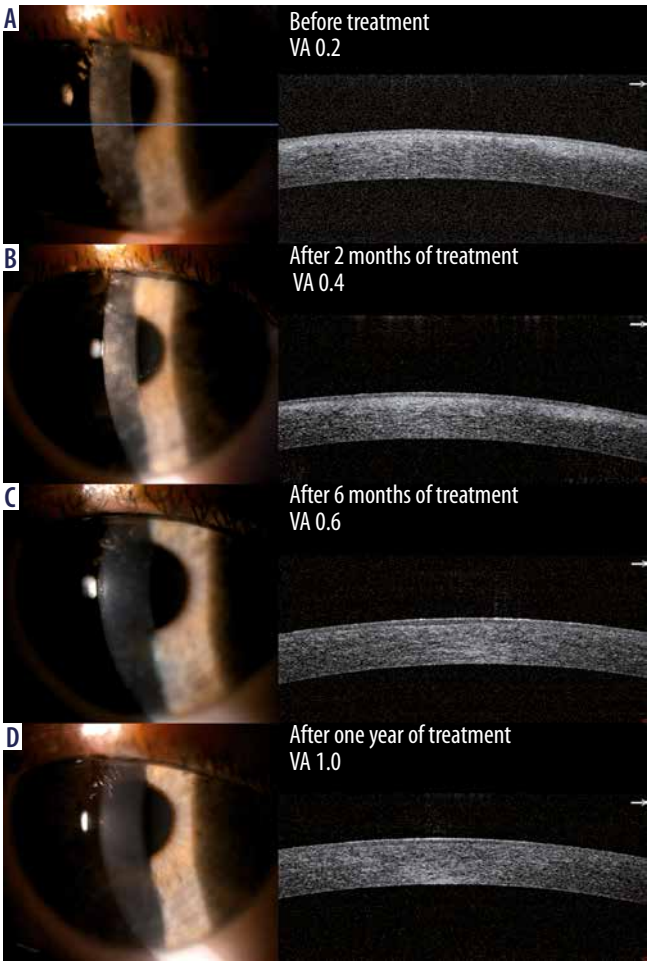

Figure 1. Corneal opacities in the left eye. The clinical picture and horizontal OCT scan (4 mm) show the lesions before treatment (**A**), during treatment (**B, C**) and after the first phase of treatment (**D**)

VA - visual acuity

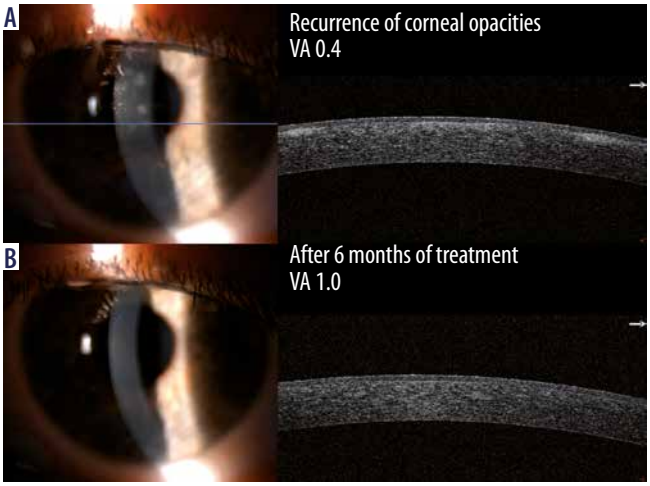

Figure 2. Recurrence of corneal opacities in the left eye. The clinical picture and horizontal OCT scan (4 mm) show the lesions before (**A**) and after 6 months of the next phase of therapy after the recurrence of infiltrates (**B**)

VA - visual acuity

plete resolution (Figure 1C, D). After a year of treatment, the patient achieved full visual acuity with the best correction (–1.0 Dcyl ax 170).

Three months after the end of therapy, the patient again reported deterioration of vision in the left eye. An ocular examination revealed a few corneal opacities (Figure 2A). Treatment with 0.1% cyclosporine 3 times a day was reintroduced, resulting in the regression of lesions and the recovery of visual acuity to 1.0 after 6 months (Figure 2B). Additionally, cyclosporine twice a day every other day for 4 months was indicated as a maintenance therapy. There was no recurrence of opacities during the follow-ups over the next 12 months. In the total follow-up of 3 years, including the treatment period, the intraocular pressure in the LE ranged from 17 to 19 mmHg. Moreover, the patient did not report any discomfort or stinging sensation while using the drug.

DISCUSSION

Corneal subepithelial infiltrates are mainly composed of lymphocytes and fibroblasts, and they develop as a result of immune response to viral antigens [7]. They may cause visual disturbances such as reduced visual acuity, photophobia, and halo effect, and lead to the development of irregular astigmatism. Therefore, starting an effective treatment is so important. Steroid eye drops containing loteprednol or dexamethasone are widely used, but with long-term therapy, there is a risk of developing glaucoma or cataract [8]. In some patients, subepithelial infiltrates do not respond to steroid treatment, or they experience a recurrence of opacities after the eye drops discontinuation. According to the literature, cyclosporine A in the form of eye drops may be used in such cases [3-6].

Cyclosporine A is an 11-amino acid cyclic peptide isolated from the fungus *Tolypocladium inflatum* in the 1970s. The substance exhibits immunomodulatory effects by reversibly inhibiting the activation and proliferation of T cells, and reducing the secretion of proinflammatory cytokines. Applied topically, it decreases inflammation on the ocular surface [9].

Several studies have been conducted to evaluate the efficacy of cyclosporine A in the treatment of corneal opacities secondary to adenovirus infection. Eligible patients in the age range from 7 to 80 years were selected for the therapy. Even though the applied product differed in the concentration of the drug substance (0.05%, 1%, 2%) and the frequency of use (once a day, 2 times a day, 4 times a day) depending on the study, a good therapeutic effect was achieved in most patients. In addition, no increase in the intraocular pressure was observed. If the symptoms recurred, cyclosporine was started again. In isolated cases, patients complained of a stinging sensation upon instillation. However, this side effect was not present in our patient. The authors of the studies concluded that the treatment was well-tolerated, safe and effective [3-6].

The presented case documents the efficacy and good tolerance of commercially available drops with 0.1% cyclosporine A in the treatment of persistent postinflammatory corneal infiltrates. The described approach represents an alternative to the routinely prescribed steroid therapy.

CONCLUSIONS

In view of its good safety profile cyclosporine A can be used in the treatment of corneal opacities in patients predisposed to an increase in the intraocular pressure. Cyclosporine A also have a beneficial therapeutic effect in the treatment of opacities resistant to topical steroids.

DISCLOSURE

The authors declare no conflict of interest.

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