Case Report

Corneal deposits following topical moxifloxacin use

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Abstract

Corneal deposits have been reported with numerous topical medications including fluoroquinolones. However, they have not been documented as a side effect of topical moxifloxacin. In this report, we describe the first case of corneal deposits following the use of preservative-free topical moxifloxacin 0.5% eye drops in a 26-year-old male with keratoconus who underwent a unilateral corneal cross-linking. Increased frequency and prolonged instillation of moxifloxacin eye drops led to corneal precipitation in this patient. Complete resolution of corneal deposits occurred four months after drug discontinuation without sequelae.

Keywords: Corneal deposits, Fluoroquinolone, Moxifloxacin

Introduction

Corneal deposits have been reported with many topical medications including fluoroquinolones. Fluoroquinolones are bactericidal, broad-spectrum antibiotics that inhibit bacterial genetic replication through DNA gyrase (topoisomerase II) and topoisomerase IV. They are widely used in ophthalmic practice for preoperative care and postoperative prophylaxis, and to treat ocular infections.

Corneal deposits have been reported with many fluoroquinolones. However, corneal deposits are not a known side effect of preservative-free moxifloxacin 0.5% eye drops. We report the first case of corneal deposits following topical moxifloxacin with complete resolution after drug discontinuation.

Case report

A 26-year-old male with bilateral keratoconus, presented to the Emergency Room (ER) at King Khaled Eye Specialist Hospital (KKESH) complaining of blurred vision in the right eye for one week duration. The patient had undergone unilateral corneal cross-linking (CXL) elsewhere thirty-eight days prior to presentation. Since CXL, the patient was instilling preservative-free moxifloxacin 0.5% eye drops (Vigamox®) every two hours in the right eye because he misinterpreted the medication schedule. He was also using preservative-free prednisolone acetate 1% eye drops four times daily for two weeks.

The uncorrected visual acuity (UCVA) was 20/40 in the right eye and 3/200 in the left eye secondary to advanced keratoconus. Slit lamp examination of the right eye revealed white paracentral dot-like sub-epithelial corneal and anterior stromal opacities with a surrounding scar, after CXL. (Fig. 1). The conjunctiva was not injected and the anterior chamber was quiet with no other signs of infection or inflammation.

Topical moxifloxacin was halted and replaced with preservative-free lubricants as well as preservative-free prednisolone acetate 1% eye drops four times daily for two weeks.

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Topical moxifloxacin was halted and replaced with preservative-free lubricants as well as preservative-free prednisolone acetate 1% eye drops to reduce scar formation. The corneal deposits completely resolved, gradually over four months leaving only the scar that occurred due to CXL (Fig. 2).
Discussion

Medication-induced corneal deposits have been reported with topical ciprofloxacin, ofloxacin, norfloxacin, sparfloxacin, gatifloxacin and tosufloxacin.2–6 No previous studies have described corneal deposits as a side effect of preservative-free moxifloxacin 0.5% eye drops.

There is only one case report in literature that described corneal deposits following polypharmacy, one of which was topical moxifloxacin.7 In the previous report, a post cataract surgery 68-year-old female was on topical moxifloxacin-dexamethasone combination hourly, and potassium iodide, calcium chloride, and sodium chloride in combination as eye drops four times daily from the first postoperative day due to retained cortical matter. Timolol maleate eye drops were also added. Corneal deposits were noted 3 weeks after beginning these medications.

The exact predisposing factors of medication-induced corneal deposits remain unknown. However, some factors have been linked to these deposits including pH level, corneal edema, corneal epithelial defect (CED) and polypharmacy with impairment of corneal epithelialization.2,7,8

In the current case report, the patient had a central corneal scar with a flattening effect in the right eye as a result of CXL. White corneal deposits were noted on slit lamp examination above this scar. The patient had administered moxifloxacin eye drops every two hours for thirty-eight days, which is considered to be too frequent and for a prolonged duration.

Corneal deposits usually occur in the corneal epithelium, but they may also be subepithelial or in the anterior stroma.5,6 In our patient, the deposits were subepithelial and in the anterior stroma.

Corneal deposits due to gatifloxacin resolve after cessation of the drug for one month,4 and ciprofloxacin corneal deposits need two months for complete resolution.2 In a case series of six cases of ofloxacin corneal deposits3, complete resolution occurred in five cases; however, one case had residual deposits following discontinuation of ofloxacin. In our case the moxifloxacin deposits resolved completely after 4 months.

Although the diagnosis is usually clinical5, corneal deposits due to fluoroquinolone can be confirmed in the laboratory by biochemical analysis of a corneal biopsy specimen.

Conclusion

Far too frequent and prolonged instillation of preservative-free moxifloxacin eye drops may lead to corneal precipitation. Complete resolution of corneal deposits occurs after drug discontinuation without sequelae.

Conflicts of interest

None.

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