CASE REPORT

Case Report on Ciprofloxacin Induced Ocular Toxicity

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Abstract

Introduction: To report a case of Ciprofloxacin induced Ocular Toxicity.
Case Report: A 75-year-old male patient was admitted to the Department of Ophthalmology for Cataract Surgery of his left eye. He was prescribed topical Ciprofloxacin 0.3% preoperatively four times daily for 5 consecutive days. After 4 days he had complaints of itching, redness and swelling in the periorbital area of the left eye. He visited the outpatient clinic and was admitted. Therapy was discontinued, and the physician prescribed medications to address symptoms. He recovered within one month.
Discussion: Fluoroquinolones can elicit a delayed type of hypersensitivity reaction which is mainly T cell-mediated. Ocular toxicity commonly arises due to ciprofloxacin administration but is seldom reported. Swelling, redness and itching of the eye have been rarely reported. The exact mechanism behind such an adverse drug reaction is unknown and might be due to patient hypersensitivity to the fluroquinolone group of antibiotics.
Conclusion: Topical ciprofloxacin medications may lead to ocular toxicity and caution is needed while using these eye drops in patients. Also, these kinds of adverse reactions must be carefully reported.

Key Words: Ciprofloxacin; Ocular Toxicity; Adverse Drug Reaction.

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INTRODUCTION

Ciprofloxacin is a widely used fluroquinolone antibiotic. It inhibits DNA replication by binding to bacterial DNA gyrase and topoisomerase IV [1]. It is widely accepted in the treatment of infections such as urinary tract infection, gastroenteritis and community-acquired pneumonia [2]. This fluroquinolone antibacterial is indicated in adults (≥18 years of age) with the following infections caused by designated, susceptible bacteria and in pediatric patients where indicated; skin and skin structure infections, bone and joint infections, complicated intra-abdominal infections, infectious diarrhea, typhoid fever (enteric fever), uncomplicated cervical and urethral gonorrhoea, inhalational anthrax post-exposure in adult and pediatric patients, plague in adult and pediatric patients, chronic bacterial prostatitis, lower respiratory tract infections, acute exacerbation of chronic bronchitis, urinary tract infections (UTI) ,acute uncomplicated cystitis, complicated UTI and pyelonephritis in pediatric patients ,acute sinusitis [3,8].

Aside from the skin, the eye is the organ most affected by ambient radiation. Physiological barriers exist that prevent penetration of most substances into the eye. However, should a photoactive compound such as a drug or dye manage to pass the blood/retinal or lenticular barriers, there may be increased potential for macular degeneration which may eventually lead to blindness [4]. To reduce the development of drug-resistant bacteria and maintain the effectiveness of this antibiotic and other antibacterial drugs, it should be used only to treat or prevent infections that are proven or strongly suspected to be caused by bacteria [5]. Fluoroquinolones including ciprofloxacin have been associated with serious adverse reactions. They should be reserved for use in patients who have no alternative treatment options for the following indications: Acute exacerbation of chronic bronchitis, acute uncomplicated cystitis, acute sinusitis, gastrointestinal disturbances, neuropsychiatric events and musculoskeletal problems. Ocular toxicity due to the topical administration of ciprofloxacin is seldom reported. Here we present a case of a patient who developed swelling, itching and redness in the periorbital area of the eye after the topical application of ciprofloxacin eye drops.

CASE REPORT

A 75-year-old male patient was admitted to the ophthalmology department for a cataract operation on his left eye. He was prescribed topical ciprofloxacin eye drop (0.3%) four times daily for 5 consecutive days preoperatively.

After 4 days of applying the eye drops, he complained of itching and redness in his left eye with swelling over the periorbital skin. There was no personal or family history of drug allergy and no other ophthalmic medications were being used by the patient. Upon examination, visual acuity was found to be 1/60, conjunctiva was congested and watery discharge noted. Ocular movement of the eye was mildly restricted and there were blisters on the periorbital skin.

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The scheduled cataract surgery was postponed immediately and the eye drops were stopped on the fourth day. He was prescribed levocetrizine 5mg and paracetamol 500mg. At one month follow-up, the patient had regained clearness of vision to 8/60 during the following days. The complaints of congestion and chemosis had resolved completely within a month. The swelling and irritation over the eye was also reduced. The causality analysis done using WHO- Uppsala monitoring centre scale was found to be probable.

DISCUSSION

Fluoroquinolones are the potent family of antibiotics used to treat various infections including ocular infections. The core structure of nalidixic acid is a quinolone, while the core structures of most Fluroquinolones consist of 4-oxo-1,4 dihydroquinoline or 4-quinolone. Fluorination at the 6-position enhances efficacy against the Gram- negative pathogens and broadens the spectrum of activity to include the Gram-positive pathogens. Substituents at the 7 position found in ciprofloxacin and ofloxacin further enhance the activity against different microorganisms [7]. Ciprofloxacin is a widely used drug among the fluroquinolones group of antibiotics. Fluoroquinolones have been associated with disabling and potentially irreversible serious adverse reactions. GI symptoms including nausea, vomiting, and severe discomfort are widely reported adverse drug reactions to ciprofloxacin. Other reported adverse events include neuropsychiatric disturbances, such as headache, dizziness etc. Ciprofloxacin also induces tendonitis and tendon rupture. Ocular complications are rarely reported. One example is retinal detachment [8]. These reactions can occur within hours to weeks after starting the drug. Patients of all ages and patients without pre-existing risk factors have experienced these adverse reactions [11]. It is important to discontinue the drug immediately at the first signs or symptoms of any serious adverse reaction. In addition, the use of fluoroquinolones should be avoided in patients who have experienced any of these serious adverse reactions. Moderate to severe photosensitivity/phototoxicity reactions, the latter of which may manifest as exaggerated sunburn reactions (for example, burning, erythema, exudation, vesicles, blistering, edema) involving areas exposed to the light, can be associated with the use of quinolones after sun or UV light exposure. Therefore, excessive exposure to these sources of light should be avoided. If phototoxicity occurs, the drug should be discontinued [4]. According to the FDA, medically important adverse reactions that occurred in less than 1% of ciprofloxacin patients on special senses include blurred vision, disturbed vision (chromatopsia and photopsia), decreased visual acuity, diplopia, tinnitus, hearing loss, bad taste [8,9].

The causality assessment of this adverse drug reaction by WHO-Uppsala monitoring centre scale was found to be a probable type of adverse event. It is difficult to reach a conclusion that the event occurs due to the excipient or drug itself. The exact mechanism is unknown and it might be because of hypersensitivity of ciprofloxacin by the patient. Studies shows that 10% of ciprofloxacin induced ocular toxicity are reported [10,11]. Fluroquinolones elicit T cell mediated delayed type of reactions [2,12].

CONCLUSION

More studies are required to better understand and evaluate these adverse events in patients and until then, Ciprofloxacin must be used with caution. In patients who experience any of these serious adverse reactions, the drugs should be discontinued immediately and fluoroquinolones should be avoided.

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