

Effect of Intravitreal Moxifloxacin in Acute Post Traumatic Endophthalmitis

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Abstract We describe results of intravitreal moxifloxacin in a case of acute post traumatic endophthalmitis & cataract developed after sustaining a penetrating ocular injury. Management included topical and intravitreal moxifloxacin. The intravitreal injection was given at the time of presentation and then was repeated after 48 hours when lens aspiration and anterior vitrectomy was performed. The patient showed a rapid recovery, and achieved 6/6 vision following surgery. To our knowledge this is the first reported case of therapeutic use of intravitreal moxifloxacin in a human case of acute post traumatic endophthalmitis. **Presentation of Case:** We report a case of a twenty one year old male referred to us with two days history of penetrating injury in left eye due to a piece of metallic wire. After five days of hospitalization, he was discharged with 6/6 partial best corrected vision. **Consent:** The patient and his family have given informed consent for the publication of this case report.

Keywords: endophthalmitis; intravitreal moxifloxacin; anterior vitrectomy

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1. Introduction

Penetrating ocular trauma is the 2nd commonest cause of acute endophthalmitis. Posttraumatic cases are commonly infected with streptococcal and gram-negative organisms that are associated with poor visual prognosis. Moreover mixed infections occur frequently, with an incidence as high as 42% in injuries from a rural environment. [1]. In contrast, in the Endophthalmitis Vitrectomy Study, approximately two thirds of the culture-positive cases with acute postoperative endophthalmitis were infected with coagulase-negative staphylococci, organisms usually associated with the best chances for a good visual outcome [2]. Recent studies have shown evidence of the beneficial role of adjunct intraocular antibiotic injection at the time of presentation in reducing the rate of acute posttraumatic bacterial endophthalmitis following penetrating trauma with intravitreal route being superior to intracameral one [3].

Currently, most cases of endophthalmitis are treated with combination of vancomycin and ceftazidime given intravitreally, to cover both gram positive and negative bacteria. The newest fourth generation quinolones, moxifloxacin and gatifloxacin, target both DNA gyrase and type IV topoisomerase, so providing superior

coverage in comparison to those gram positive bacteria those are already defiant to the 2nd and 3rd generation fluoroquinolones, and it also sustain exceptional exposure for gram-negative bacteria with lowest of minimum inhibitory concentration [4]. This provides the rationale for the use of single antibiotic with broad spectrum coverage in cases of endophthalmitis following trauma.

2. Case Report

A twenty one years old non diabetic male was referred to us with two days history of penetrating injury in left eye due to a piece of metallic wire. His visual acuity was perception of hand movements only. There was lids oedema, photophobia, excessive lacrimation and circumcorneal congestion. Slit lamp biomicroscopy revealed 1×1 mm corneal perforation at 2 o'clock sealed with iris tissue, +4 anterior chamber cells, +3 flare, 2 mm hypopyon, and a peaked pupil with posterior synechiae. There was intumescent cataract and hazy view of vitreous and retina. B-scan ultrasound revealed few vitreous opacities suggestive of lens matter from disruption of the posterior capsule and flat retina. He was diagnosed as a case of post traumatic endophthalmitis and started with hourly topical 0.5% moxifloxacin and 1.0% prednisolone acetate eye drops along with analgesics and systemic

antibiotic i.e. levofloxacin 500g bid for one day and then od thereafter. After taking a written informed consent a vitreous biopsy through vitreous cutter for culture and sensitivity was taken followed by a single intravitreal injection of 0.05 ml (0.25 mg) undiluted commercially available self-preserved moxifloxacin hydrochloride (Vigamox eye drops, Alcon labs, USA) given through pars plana approach. Following the injection, the periocular pain diminished gradually, and there was marked reduction in anterior chamber reaction.

After forty-eight hours, lens aspiration along with anterior vitrectomy and 0.025 ml (0.125 mg) of intravitreal injection of moxifloxacin with 0.2 mg dexamethasone was given. Postoperatively the topical drops were reduced in frequency to three hourly dosage and he showed rapid improvement of symptoms and signs. After five days of hospitalization, he was discharged with 6/6 partial best corrected vision. The antibiotic drops were stopped after two weeks and steroid eye drops were tapered off in four weeks time. Next six months follow up did not reveal any sign of inflammatory activity.

3. Discussion

Cases of penetrating trauma associated have significantly increased chances of clinical endophthalmitis [5]. Vitrectomy along with antibiotic injection is an effective strategy for combating infection in the vitreous cavity than antibiotic injection alone [6]. Gatifloxacin and moxifloxacin, being fourth generation and the most potent of the fluoroquinolones, have been suggested as single agent replacements to vancomycin and ceftazidime combination for providing expanded coverage for the prevention and treatment of ocular infections [7,8]. Various bacteriological, histopathologic, and clinical outcome studies in experimental animal and cell culture models have explored its role in endophthalmitis [9] and demonstrated safety of intravitreal moxifloxacin with doses up to 300 µg/mL [10].

Keeping aforementioned studies in mind we planned intravitreal injection of self preserved moxifloxacin in our tertiary care facility. After taking approval from ethical committee, we explained the potential risks/benefits and obtained the informed consent from the patient. As the undiluted commercially available drops were used, it also avoided the cumbersome procedure of injection preparation.

The result of injection was remarkable, with rapid reduction of inflammatory reaction. Prior vitreous biopsy was taken for culture and sensitivity as per the “silver standard” guidelines for prevention and treatment of acute endophthalmitis by the European Society of Cataract and Refractive Surgery, 2007 [11]. Half dose of intravitreal antibiotic dose was further given at the end of lens aspiration and vitrectomy since the absence of vitreous enhances rapid diffusion of antibiotics towards the retina [12]. The biopsy results revealed *Streptococcus pyogenes* susceptible to quinolones. The rapid response to moxifloxacin in our case augments the notion that this drug has definite potential as an alternative to vancomycin

and amikacin in cases of acute endophthalmitis. To our knowledge this is the first reported case of use of intravitreal moxifloxacin in humans as an exhaustive search on Medline in the last ten years did not reveal any similar study.

4. Conclusion

Self-preserved Intravitreal moxifloxacin hydrochloride proved to be an effective and safe drug in treatment of post traumatic endophthalmitis in this case however larger case controlled studies would be required to assess the long term effects of this drug.

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