Case report

A case of nocardia keratitis treated successfully with topical amikacin

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Abstract

Background: Keratitis caused by the nocardia species is rare in clinical practice and can cause confusion during treatment because it often mimics fungal keratitis. **Case:** This is a case of nocardia keratitis occurring in a forty-year-old lady without any predisposing factors. It was initially treated as fungal keratitis, then as herpes simplex viral keratitis, but once the organism was known, it was successfully treated with topical fortified amikacin 14 mg/ml (1.4 %). **Conclusion**: Delay in diagnosis can occur in nocardia keratitis due to its rarity in occurrence. It responds well if proper therapy is instituted on time.

Key-words: nocardia keratitis, amikacin

Introduction: Nocardia (N) are branching filamentous bacteria and often cause dilemma in clinical practice because of similarity in morphology and clinical picture with fungal keratitis. As it is an unusual etiology of keratitis, diagnostic delay can occur resulting in prolonged ocular morbidity. Prognosis of N keratitis is good if treated appropriately in time (Sridhar et al, 2001b).

Case: A forty year old lady from Bihar, India, came to Tilganga Institute of Ophthalmology (TIO) on 10th November 2010 with chief complaints of redness, watering, white lesion and decreased vision for 25 days. Onset of symptoms was spontaneous without history of trauma or foreign body getting in the eye. Her past ocular history was not significant. She was non diabetic, non hypertensive and did not have any other known systemic illness. After one week of her symptoms, she consulted an eye hospital where she was treated as fungal corneal ulcer on clinical basis. She received topical natamycin 5%, tobramicin 0.3% and atropine 1% eyedrops. She did not get better with 3 weeks of the therapy. So she was referred to TIO.

On examination, vision in right eye was 6/6 with normal lid and adnexa, anterior and posterior segment findings. In the left eye, which was the affected eye, vision was 3/60 which did not improve with pin hole. Eyelids were normal except for mild swelling. There was circumcorneal and conjunctival congestion. There was white infiltrate in the paracentral region in the inferonasal quadrant of the cornea. In the slit beam, the infiltrate was superficial involving 1/3 of anterior stroma and measured 4.5x3.2 mm. It was dry looking and patchy with irregular margin. There was epithelial defect measuring 3.5x2.5mm overlying the infiltrate. Fine keratic precipitates were present in the endothelium. Anterior chamber showed 2+ cells. Iris and lens were normal and pupil was pharmacodilated. Fundus view in the left eye was hazy with faint view of disc and macula. Corneal sensation was slightly decreased in the left eye compared to the right eye. Our provisional diagnosis was also fungal corneal ulcer. Smear report on the same day showed fun-

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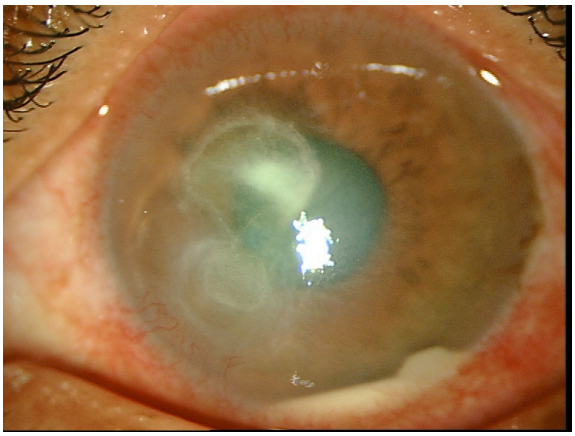
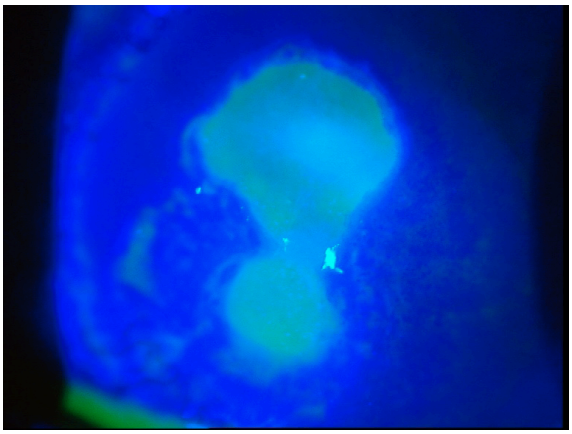
gal elements in potassium hydroxide stain, Gram and Giemsa stains showed pus cells only whereas culture, reported after 72 hours of incubation was sterile. Patient was put on intensive antifungal treatment with natamycin 5% and fluconazole 0.3% , both eyedrops every hour , ofloxacin 0.3% every 3 hours, fluconazole 150 mg once a day and ciprofloxacin ointment 0.3% at bedtime. Patient was symptomatically better and seemed to respond with this regimen, till day 16 of presentation, when, she complained of worsening pain. Her ulcer size had increased to involve superonasal quadrant of cornea along with appearance of hypopyon about 1mm. Her culture report followed after 3 weeks' incubation was inconclusive. Patient's diagnosis was revised. Corneal sensation was rechecked which was decreased, so acyclovir 400mg five times a day was added to her treatment and olfoxacin drops increased to every two hours. With this change, patient started to feel better. On day 26, hypopyon and corneal ulcer size decreased in measurements. Then patient was put on topical prednisolone acetate 1% at a dose of three times a day to settle the inflammation thought to be due to herpetic keratouveitis. But the next follow up on day 30, showed increase of hypopyon, epithelial defect and infiltrate (Figure 1a and 1b). So patient underwent diagnostic rescraping of the ulcer which revealed gram positive beaded filaments in the smears and in five days, growth of N species was reported. Antifungals, antibiotics, acyclovir and steroids, all were stopped. Amikacin was started at 14mg/ml (1.5%) every hour. With this, patient started to show improvement both subjectively and objectively. Amikacin was gradually tapered. Hypopyon disappeared after two weeks of therapy (Figure 2a and 2b). Complete epithelialization took place in the following week. All medications were stopped after 4 weeks of treatment. A macular scar in the paracentral cornea was the sequel. Central cornea was clear. Patient's unaided vision improved to 6/24 and 6/12 with pin hole. Patient could have been satisfied with her vision as she did not come for refraction and prescription for glasses.

Figure 1



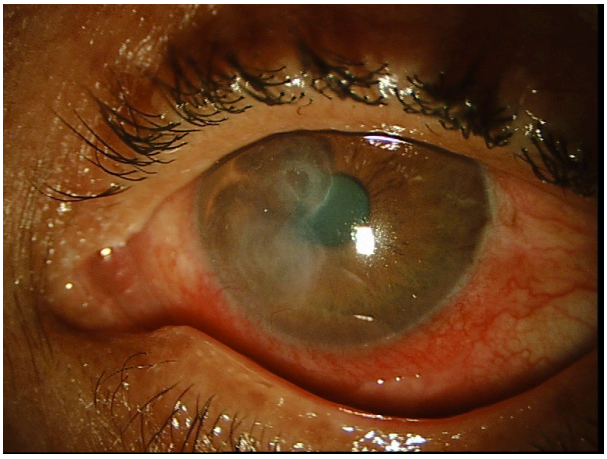
(a)



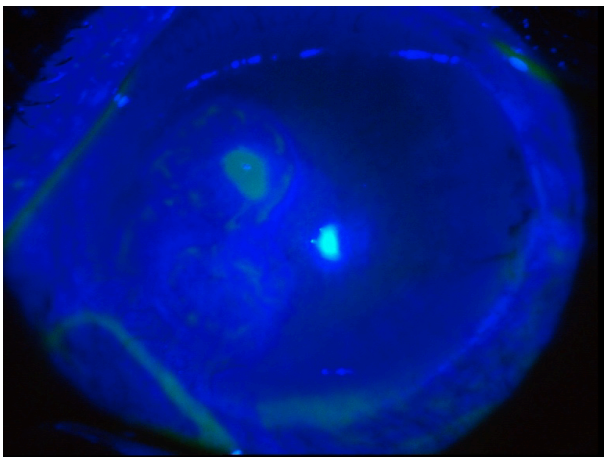
(b)

Figure 1. Nocardial infiltrate and hypopyon (a) in diffuse light (b) with flourescein stain and blue light showing epithelial defect

Figure 2



(a)



(b)

Figure 2: Resolving Nocardia keratitis (a) after two weeks of topical amikacin (b) same figure with fluorescein stain showing a small epithelial defect

Discussion: Nocardia are rod shaped bacteria with branching filaments which make them confuse with fungal hyphae. They take Gram stain and are weakly acid fast. N is ubiquitous and is found in soil, mud, dust and decaying vegetations. N are usually not present as flora in the human body. N is slow growing organism; hence in most of the instances, infection does not progress rapidly. Commonly reported infections are in lungs, skin and eye but in immunocompromised host it can cause disseminated disease in any organ (Sridhar et al, 2001b; Ryan et al, 2004). Keratitis is the most frequently encountered ocular involvement than scleritis or endophthalmitis (Rao et al, 2000). Sporadic cases have been reported for dacryocystitis, preseptal cellulitis, and conjunctivitis (Sridhar et al, 2001b).

N keratitis is uncommon in clinical practice. Upadhyay et al (1991) had shown N as cause of keratitis in Nepal in 0.3 % of infective corneal ulcers, whereas no cases of N keratitis detected from the records of TIO (Feilmeier et al, 2010). In South India it is reported to be 1.42 % (Bharathi et al, 2003). Incidentally, our patient is from Bihar, North India.

Trauma is the most common inciting factor in 25 to 84% of cases for N keratitis. (Sridhar et al, 2001b; Lalitha et al, 2007). Other predisposing factors are recent or prior ocular surgery, scleral buckle infection, and contact lens wear. N species can cause infection in healthy individuals without any predisposing factors as well as in immunocompromised host (Sridhar et al, 2001b; Sridhar et al, 2001c).

Lalitha et al (2007) described N keratitis, when presented early, as discrete, yellowish white, pin head size infiltrate in wreath like pattern,. In later course of the disease, it presents as patchy infiltrate in the anterior stroma with irregular margin and satellite lesion. This may resemble fungal infection. Untreated, the infection progresses to involve whole stroma and endothelium and without any specific clinical characteristic features, at this stage, it may look like bacterial or fungal keratitis. Anterior chamber reaction and hypopyon are usually associated. Keratic precipitates and endothelial ring deposits can also be seen. There is also a case report of aspergillus fumigatus presenting as infiltrate in wreath like pattern like nocardia (Sridhar et al, 2001a). In our case, when patient presented almost a month after the onset of symptoms, it was showing patchy infiltrate with irregular margin and satellite like lesion. Because of unsusal in occurrence, strong suspicion and good collaboration is needed between the clinician and lab technician.

N are strict aerobes and grow in routine media like blood, chocolate, sabouraud dextrose and brain heart infusion broth. Growth occurs after 2 to 3 days incubation in air. Colonies initially are tiny and have dry, wrinkled, chalk – like appearance. With prolonged incubation, they appear waxy, hard or rough with white to orange pigmentation (Sridhar et al, 2001; Ryan et al, 2004). When our patient presented, she was getting tobramycin eye drops six times a day and ciprofloxacin ointment at bedtime. Tobramycin, gentamicin and ciprofloxacin have variable sensitivity towards nocardia, depending upon the species (Lalitha et al, 2007; Sridhar et al, 2001c). This could have affected the growth in culture, which was negative in the first corneal scraping,

In our case, anterior chamber reaction and endothelial keratic precipitates as well as moderate de-

crease in sensation led us to suspect and treat for viral etiology. Apparent decrease in symptoms made us think the hypopyon is reactionary due to viral keratitis and prednisolone acetate drops were added. To our surprise keratitis worsened. It is only after the second corneal scraping, the diagnosis was confirmed. This shows how the unusual nocardia keratitis can cause confusion and delay in diagnosis, which in this case was 35 days after presenting to the hospital. If diagnosis of N keratitis is made in time and treated appropriately, it has good prognosis and complications like perforation, scleral extension , endophthalmitis and loss of eye ball can be prevented (Rao et al, 2000).

The commonest species for N. keratitis had been N. asteroides followed by N. Brasiliensis and N. otitidis-caviarum (Sridhar et al, 2001b). In our case, the species was not identified due to limitation of laboratory facility.

Various literatures show that amikacin is the drug of choice for nocardiasis (Sridhar et al, 2001c; Denk et al, 1996; Reddy et al, 2010). In our patient, keratitis improved with amikacin 14mg /ml (1.4%) every hour, which is lower than the concentration, 2 to 5% used in different case reports (Lalitha et al, 2007; Sridhar et al, 2001c; Denk et al, 1996). Other drugs which are shown to be effective are trimethoprin-sulphamethoxale combination and sulphacetamide (Sridhar et al, 2001b). There is a report of N transvalensis which was resistant to amikacin and was successfully treated with oral trimethoprim–sulfamethoxazole and ciprofloxacin drops (Pandya, 2008).

Conclusion: Nocardia keratitis can be missed due to rarity in occurrence. Its presentation looks like fungal keratitis. It may not respond to the conventional antibiotics and antifungals used for the treatment of corneal ulcer. An index of suspicion and laboratory confirmation is important for the correct diagnosis. Topical amikacin has been effective and is considered as the drug of choice in N keratitis.

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