Case Report

Blindness due to *Acanthamoeba*: first case report from Sudan

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Abstract

Acanthamoeba is a free-living protozoan widely distributed in soil, water, and air. It can cause corneal infection (keratitis) in man, and may lead to blindness of the affected eye in 15% of untreated cases.The main risk factors are eye trauma and contact lens wearing. Early presentation of *Acanthamoeba* keratitis patients usually includes ocular pain, photophobia, and a unilateral red eye. The story of a female Sudanese housewife who suffered a blind left eye due to *Acanthamoeba* is described in this report.

Key words: *Acanthamoeba*, blindness, keratitis

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Introduction

Acanthamoeba is a free-living amoeba found in a wide range of environments that include soil, tap water, swimming pools, sea water, and air. *Acanthamoeba* is well recognized as human pathogen that can cause a painful keratitis leading to blindness in 15% of untreated cases.[(1)] It can also, rarely, cause agranulomatous encephalitis in immunocompromised individuals, typically HIV/AIDS patients.[(2)] The main risk factors associated with *Acanthamoeba* keratitis (AK) are minor eye trauma and contact lens wearing (CLW). Intially, patients suffer from severe ocular pain, photophobia, and a unilateral red eye. [(3)]

Laboratory diagnosis of AK can be made by microscopy, serology, culture, and molecular techniques. However, the routine methods are microscopy examination of wet mounts of a corneal swab/scraping or culture of the same type of specimens in non-nutrient agar seeded with *Esherichia coli* bacteria.[(4)] Blindness of the affected eye is frequently related to significant diagnostic delay because patients are treated intially as viral, bacterial, or fungal keratitis. The first cases of AK were reported in 1974.[(5)] Global interest in *Acanthamoeba* organism was reflected in over 500 publications worldwide, as by 2004.[(6)] In Saudi Arabia, AK was reported from Riyadh in a patient who was contact lens wearer during 1999.[(7)]
In this communication, we describe a blinding AK case seen in Sudan, and we are unaware of previous documented cases from the country.

Case Scenario

A 55-year-old female Sudanese housewife experienced a foreign body (dust particle) in her left eye and started to complain of eye pain and hyperaemia.

Within few weeks she complained of increasing eye pain and was seen at many health facilities and given several treatments for viral and bacterial infections. The patient was referred to our *Acanthamoeba* Study Project (2003-2005) at eight months duration of onset of symptoms; because of severe recurrent eye pain and total loss of vision in her affected eye (Figure 1).

The patient is a known diabetic for 14 years and systemic clinical examination revealed no abnormalities. Local examination of the affected eye showed thickly scarred cornea, intense hyperaemia, and total loss of vision. We inoculated a swab from the affected eye onto a non-nutrient agar seeded with *Esherichia coli* bacteria and inubated at 30 C. *Acanthamoeba* trophozoites showing typical acantha (spine-like projections from the organism surface) were easily isolated after overnight incubation (Figure 2). Identification to *Acanthamoeba* Group 2 species level was made on the basis of thermotolerance & osmotolerance of the organism during growth. [8] Oral ketoconazole in a dose of 200 mg twice daily was given for two months. Meticulous eye hygiene was maintained by repeated topical applications of 0.9% saline. The patient was completely relieved of her eye pain and hyperaemia. However, her cornea was already thicly scarred due to chronic AK and the patient remained with her total loss of vision. At 18 months follow up, our patient had no recurrence of ocular pain or hyperaemia.

Discussion

AK was described as an epidemic associated mainly with CLW in a study from the USA.[9] In a case series of 11 AK patients from India, all of them were agricultural workers who did not use contact lenses.[10] Similarly, a case report of AK from Sweden described an HIV infected female patient who did not use contact lenses.[11] Our case who had minor eye trauma following foreign body entry, adds to the point that risk factors for AK depend on the way the organism reaches the eye cornea. It can also be inferred that occupation involving soil eg agriculture is important as risk factor for AK.

Blindness due to *Acanthamoeba* is a preventable disease. In a population based study on causes of blindness in Sudan, *Acanthamoeba* was not encountered, probably because it was not suspected and hence not looked for.[12] Significant diagnostic delay of AK is a major factor that may lead to blindness in 15% of untreated cases.[1] We have used culture tehnique for diagnosis of our case.

Molecular biology methods such as mitochondrial DNA Restriction Fragment Length Polymorphysim, has been used in laboratory diagnosis of *Acanthamoeba* infection, however, the organism high degree of heterogeneity is a problem in using that technique. [13] Some workers have used zymodeme pattern analysis (isoenzyme profiles) for diagnosis and species differntiation of *Acanthamoeba.*[14] These methods are not always reproducible. For example, while distinct differences in the acid phosphatase and esterase isoenzyme profiles in

Acanthamoeba palestensis and *Acanthamoeba pustulosa* were reported by one investigator, identical isoenzyme patterns were found by another investigator.[8]

Conclusion

We think that patients who present with chronic keratitis not responding to standard therapy against viral, bacterial, or fungal agents should be examined for *Acanthamoeba* infection. We assume that the magnitude of AK blinding disease is likely to be much more than is realized, and this aspect remains to be explored.

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Figure 1. Thickly scarred cornea due to *Acanthamoeba* indicating a blind eye. Note intense hyperaemia

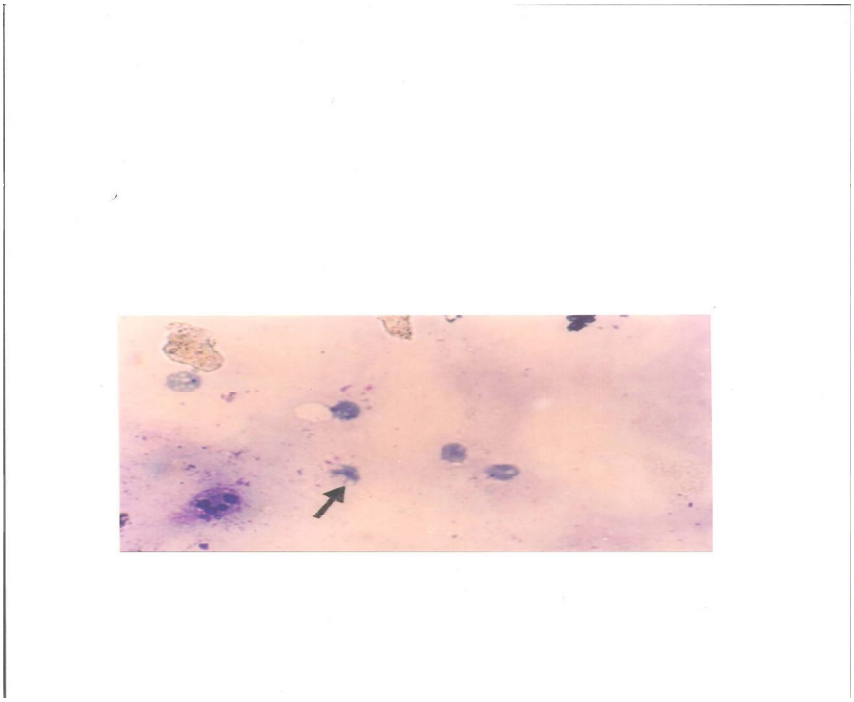

Figure 2. *Acanthamoeba* trophozoite (arrow) as isolated from the patient eye swab. Note typical acanthopodia. Giemsa stain (X 400)