

SHORT COMMUNICATION

A Case of Non-Contact Lens related *Acanthamoeba* keratitis in Malaysia

Mohamed Kamel, A.G.^{1*}, Faridah, H.², Yusof, S.³, Norazah, A.⁴ and Nakisah, M.A.⁵

¹Department of Biomedical Science, Faculty of Allied Health Sciences, Universiti Kebangsaan Malaysia

²Department of Ophthalmology, Universiti Kebangsaan Malaysia

³Department of Parasitology, Faculty of Medicine, Universiti Kebangsaan Malaysia
50300 Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia.

⁴Division of Bacteriology, Institute for Medical Research, Jalan Pahang, Kuala Lumpur, Malaysia.

⁵Faculty of Science and Technology, Kolej Universiti Terengganu
Email : _mkamal@medic.ukm.my

ABSTRACT

Acanthamoeba is a ubiquitous free-living amoeba and is responsible for an uncommon yet increasingly diagnosed keratitis in humans. *Acanthamoeba* keratitis is perhaps the most challenging ocular infection to manage successfully and it can result in permanently impaired vision or blindness. Although contact lens use is the principal risk factor, about 10% of cases occur following trauma and exposure to contaminated soil or water. Cases of *Acanthamoeba* keratitis involving contact lens wearers have previously been reported in Malaysia but this is the first time, a non-contact lens related *Acanthamoeba* keratitis is reported. The case involved a 28 year old Indonesian male construction worker who had a trauma of the right eye. While working his eye was struck by some sand and dust particles and he quickly washed his eye with water from an open tank at the construction site. He then experienced pain, redness, glaring and blurring of vision of the right eye. The diagnosis was missed at the initial presentation but subsequent culture of the corneal scraping demonstrated *Acanthamoeba* as the aetiological agent. The history, clinical findings, diagnosis and treatment of non-contact lens related *Acanthamoeba* keratitis are briefly discussed in this communication. We hope to create awareness especially among the medical and paramedical staff about the existence of this infection in the country and fully support the consideration of *Acanthamoeba* keratitis as part of the differential diagnosis of most cases of presumed microbial keratitis.

Keywords : *Acanthamoeba*, keratitis, trauma, contact lens

INTRODUCTION

Small free-living amoebae belonging to the genera *Acanthamoeba* occur world-wide and have been isolated from a wide range of environmental niches including water, soil and dust in air (De Jonckheere, 1991). They are resistant to disinfectants, temperature variations and desiccation and are responsible for two recognized diseases in humans, granulomatous amoebic encephalitis and keratitis (Colin, 1996). Although rare, *Acanthamoeba* keratitis is one of the most severe and potentially sight threatening ocular parasitic infectious diseases and is recognized as the most challenging among ocular infections because of the protracted painful clinical course and frequently encountered treatment failures (Narasimhan S, Madhavan H and Therese L. 2002).

Initial cases were recognized in 1973, but the disease remained very rare until the 1980's when increased incidence of the disease were recorded and were mainly associated with contact lens wear (Bacon, *et al.*, 1993; Seal, Hay and Munro, 1994). In Malaysia, the first case of *Acanthamoeba* keratitis was reported in 1995 involving a woman contact lens wearer (Mohamed Kamel and

Norazah, 1995). Subsequently more cases were observed (Mohamed Kamel, *et al.*, 2000), though not reported, and by the end of 2001 at least 10 cases were diagnosed at the Universiti Kebangsaan Malaysia Hospital (HUKM) (Kamel, *et al.*, 2003). We hereby report the first case of non-contact lens related *Acanthamoeba* keratitis in Malaysia.

CASE REPORT

The patient was a 28 year old Indonesian male construction worker who had trauma of the right eye. While working his eye was struck by some sand and dust particles and he quickly washed his eye with water from an open tank at the construction site. He then experienced pain, redness, glaring and blurring of vision of the right eye. He sought treatment from several general practitioners who prescribed topical antibiotic eyedrops but his worsened. He was later referred to an eye specialist at UKM who made a provisional diagnosis of *Acanthamoeba* keratitis. The clinical findings were conjunctival congestion, corneal ulcer measuring 5.4 x 6.7 mm but no hypopyon.

*Corresponding author

Corneal specimens taken for culture were obtained by scraping the affected epithelium and stroma with a Kimura spatula. The corneal specimens were then plated onto a non-nutrient agar medium with *Escherichia coli* overlay. *Acanthamoeba* was isolated from the culture, thus confirming the diagnosis. He was treated with topical Propamidine isethionate (Brolene), Chlorhexidine 0.02% and fortified Gentamycin. His condition improved and after 12 days of treatment, the ulcer showed peripheral healing and his vision improved and by day 32 the ulcer was barely visible. Unfortunately the patient absconded from the hospital and had never returned for follow up.

DISCUSSION

Early in its history, *Acanthamoeba* keratitis was associated with corneal trauma, which is the main portal of entry. Recently however, *Acanthamoeba* keratitis is being diagnosed increasingly in persons who wear contact lenses. About 10% of cases occur following trauma and exposure to contaminated soil or water (Dart, 1995). Most of the *Acanthamoeba* keratitis cases seen in Malaysia are contact lens related. In this case report, the infection was related to trauma to the right eye by sand and dust particles. It was possible that he could have acquired the organisms from these sources as *Acanthamoeba* has been isolated from various environments including soil (Mohamed Kamel, *et al.* 2004), water (Mohamed Kamel, *et al.*, 2000; Kamel, *et al.*, 2004) and air in Malaysia. Following the injury, he washed his eyes with water from an open tank at the construction site which could have also contributed to the exposure of the organism to the eye as *Acanthamoeba* is a known waterborne parasite (Seal, Hay and Munro, 1994). The patient then experienced acute onset of redness, pain, glaring and blurring of vision of the right eye and had sought treatment from several general practitioners who prescribed topical antibiotic which proved ineffective. Only 3 weeks later was the patient referred to an ophthalmologist who discovered that he had a big corneal ulcer.

The onset of corneal infection by *Acanthamoeba* may be rapid or subtle, depending on the route of entry of the amoebae. If the cornea is damaged by trauma, as in this case, a more rapid process develops with ulceration, severe pain and marked loss of vision. However, when the amoebae are introduced by the use of contaminated contact lenses, the symptoms develop more slowly and may be intermittent (Colin, 1996). The condition is often misdiagnosed as other forms of microbial keratitis and therefore not treated appropriately. The symptoms persist and the delay before *Acanthamoeba* is identified as the cause may lead to increase in severity of the condition.

Contact lens wear is gaining popularity worldwide (Seal, Hay and Kirkness, 1995) especially with work-related use. Contact lenses are worn by 5% of the Malaysian populations (Anne, 2001). They offer great visual and cosmetic benefits. However, their improper usage is not without any risk, as where contact lenses are worn, this represents the greatest single risk factor for *Acanthamoeba* keratitis (Moore, McCulley and Newton,

1987; Kirkness, Seal, and Aitken, 1994). In developing countries, majority of *Acanthamoeba* keratitis cases are trauma related and are not associated with contact lens wear (Sharma, *et al.*, 2000; Parija, *et al.*, 2001). Previous reports showed that trauma was the most important predisposing factor for *Acanthamoeba* keratitis cases seen in India and most of the patients (Sharma, *et al.*, 2000) were agricultural workers who gave a history of injury to the eye (Parija, *et al.*, 2001).

What makes this relatively rare condition of such great interest is the devastating nature of the disease and its legendary resistance to treatment. Although treatments have evolved over the past several years, lengthy course of treatment, recalcitrant pain and threat of permanent, severe, visual loss are still common features in many cases (Peter, 2002). Very often in most cases, the patients are seen first by the general practitioner or family physician who might not be aware of such infection. The patients might be wrongly treated for other causes of keratitis. They would only be referred to the ophthalmologist when their conditions had deteriorated, as seen in this case. Fortunately, the patient responded well to medical treatment with topical Propamidine isethionate (Brolene), Chlorhexidine 0.02% and fortified Gentamycin. These were also the drugs used in one of our earlier case of *Acanthamoeba* keratitis involving a contact lens wearer who was successfully treated (Mohamed Kamel *et al.*, 2000).

This report highlights the need for increased clinical recognition of the signs and risk factors for *Acanthamoeba* keratitis among non-contact lens wearer, as early diagnosis and prompt treatment are associated with improved clinical outcome.

Since *Acanthamoeba* keratitis is now seen with increased frequency enough in Malaysia, it should be considered as part of the differential diagnosis in most cases of presumed microbial keratitis.

REFERENCES

- Anne, C.K.T. (2001). Visual benefits with contact lenses. *Medical Journal of Malaysia supplement B* 56:37.
- Bacon, A.S., Frazer, D.G., Dart, J.K.G., Matheson, M.M., Ficker, L.A. and Wright, P. (1993). A review of 72 consecutive cases of *Acanthamoeba* keratitis, 1984-1992. *Eye* 7:719-725.
- Colin W.B. Walker (1996). *Acanthamoeba*: ecology, pathogenicity and laboratory detection. *British journal of Biomedical Science*. 53:146-151.
- Dart, J.K.G. (1995). *Acanthamoeba* keratitis and contact lens wear. *Community Eye Health* 8: 15: 2-3.
- De Jonckheere, J.F. (1991). Ecology of *Acanthamoeba*. *Rev Inf. Dis* 13(suppl 5):S385-7.
- A.G.M., Anisah, Yusof, Faridah, Michael, Norhayati and Norazah, A. (2003) *Acanthamoeba* keratitis is not so rare in Malaysia. *Medical Journal of Malaysia* 58: 150.
- Kamel, A.G.M., Saleha, Anisah Nordin, Yusof Suboh, Norhayati Moktar and Norazah (2004). Isolasi *Acanthamoeba* spp. daripada persekitaran akuatik.

- Prosiding Simposium Sains Kesehatan Kebangsaan ke 5, Marrriot Putrajaya 25-26 Mei 2004 pp. 497-501.
- Kirkness, C.M., Seal, D. and Aitken, D. (1994).** *Acanthamoeba* keratitis. *Ophthalmol. Clinic of North America* **7**: 605-616.
- Mohamed Kamel, A.G. and Norazah, A. (1995).** First case of *Acanthamoeba* keratitis in Malaysia. *Trans Roy. Soc. Trop. Med. Hyg.* **89**:6: 652.
- Mohamed Kamel, A.G., Faridah Hanum, Norazah, A., Noor Rain, A., Hay, J. and Seal, D. (2000).** A case of waterborne contact lens associated *Acanthamoeba* keratitis from Malaysia: Successful treatment with Chlorhexidine and Propamidine. *International Medical Journal* **7**: 63-65.
- Mohamed Kamel, A.G., Mimi Fazah, Putri Noradyani, Anisah Nordin, Yusof Suboh, Norhayati Moktar and Noraina AR. (2004).** Pemencilan *Acanthamoeba* sp. daripada tanah. Prosiding Simposium Sains Kesehatan Kebangsaan ke 5, Marrriot Putrajaya 25-26 Mei 2004 pp. 505-506.
- Moore, M.B., McCulley, J.P. and Newton, C. (1987).** *Acanthamoeba* keratitis: a growing problem in hard and soft contact lens wearers. *Ophthalmol.* **94**:1654-1661.
- Narasimhan S, Madhavan H and Therese L. (2002).** Development and application of an in vitro susceptibility test for *Acanthamoeba* species isolated from keratitis to polyhexamethylene biguanide and chlorhexidine. *Cornea* **21**(2):203-205.
- Parija, S.C., Prakash, M.R., Rao, V.A. and Vellaniparambil, R.J. (2001).** *Acanthamoeba* keratitis in Pondicherry. *J Commun Dis* **33**(2):126-129.
- Peter Bergenske (2002).** Lens care update: How concerned should we be about *Acanthamoeba*? *Review of optometry* **3**: 18-21.
- Seal, D., Hay, J. and Munro, A.M. (1994).** *Acanthamoeba* keratitis: a waterborne disease. *British Journal Opt. and Dis.* **2**: 475-80.
- Seal, D., Hay, J. and Kirkness, C .M. (1995).** *Acanthamoeba* keratitis and contact lens wear: The need for a global strategy for prevention of corneal infection. *Community Eye Health* **8**: 4-5.
- Sharma, S., Garg, P. and Rao, G.N. (2000).** Patients characteristics, diagnosis, and treatment of non-contact lens related *Acanthamoeba* keratitis. *British Journal of Ophthalmol.* **84**:10:1103-8.