Acanthamoeba Keratitis in Non-Contact Lens User

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Abstract

Acanthamoeba is a genus of free-living amoebae. It is capable of causing serious infection, as opportunists of the central nervous system and of the eye. Acanthamoeba keratitis is frequently associated with contact lens use. We report a case of this condition in a non-contact lens wearer. A young adult presented with severe pain and haziness of vision in the right eye. The diagnosis of Acanthamoeba keratitis was made on microscopy and culture. The patient responded clinically to treatment .

Introduction

The genus Acanthamoeba are free-living amoebae belonging to Superclass- Rhizopoda, Sub. Phylum - Sarcodina, Phylum - Sarcomastigophora. They are widely distributed in the soil and water habitats throughout the world Under unknown conditions they become opportunistic pathogens in human beings.

They exist in trophozoite and cyst stages. The trophozoite of Acanthamoeba moves slowly and is identified by distinct tapering, spine-like pseudopodia called as acanthopodia (acanth - meaning spine) The cyst is 15-20 micrometer in diameter, polygonal or star shaped with a centrally located nucleus and a prominent nucleolus.

Acanthamoeba causes two distinct clinical entities- Granulomatous Amoebic Encephalitis and Acanthamoeba keratitis. Here we report a case of Acanthamoeba keratitis in a non- contact lens wearer.

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Case Report

A 28 year old male, was admitted to ophthalmology ward in Pad. Dr.D.Y. Patil Medical College and Hospital with severe, distressing pain, redness, and watering of right eye since 45 days, alongwith foreign body sensation in the right eye.

On examination the vision was hazy with circum corneal congestion and lid oedema. Corneal examination revealed complete annular peripheral vascularisation of cornea. A circular central ulcer was seen. Iritis was present. Pupil was dilated and normally reacting to light. Intraocular tension was normal. Extra ocular movements were painless. Left eye examination was within normal limits.

The patient gave no history of trauma to the right eye, no history of swimming or contact lens use. Considering the chronicity, corneal scraping was sent to the laboratory.

The Gram stain revealed no organisms. In KOH and saline mounts fungal elements were not detected. However double walled, polygonal cysts, likely to be of Acanthamoeba were seen.

A presumptive diagnosis of Acanthamoeba keratitis was made. Cultures were set up for routine bacterial and for fungal isolation. A non-nutrient agar (water Agar medium) seeded with Escherichia coli was inoculated and incubated at room temperature.[3,4]

Bacterial culture and subsequently fungal cultures showed no growth. The water agar medium showed characteristic clear zones where Escherichia coli were engulfed, leaving trails of clearing after 24

hours.

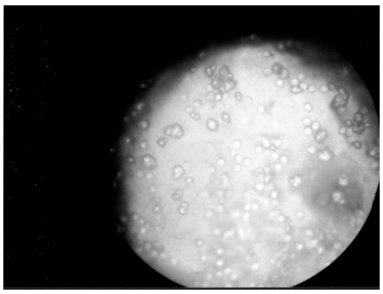

Fig-1 Shows culture plate with areas of clearing where Acanthamoeba grew.

Methylene Blue stain revealed trophozoite and cyst forms with crenated margins.

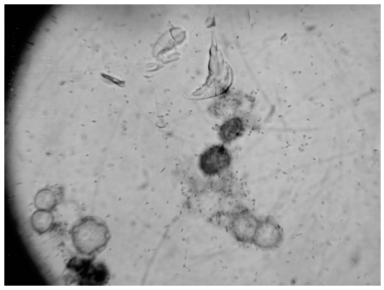

Fig- 2 Methylene blue wet mount showing cysts with crenated margins

The patient was started on atropine , neosporin and PHMB eye drops.

Discussion

Ocular infections due to Acanthamoeba are characterised by chronic progressive ulcerative keratitis, in apparently healthy individuals. Both cysts and trophozoites are infective stages. Swimming in contaminated water or using contaminated solutions to clean contact lenses may lead to this. Contact lens usage is the single most important risk factor and is associated with 75-93% cases of Acanthamoeba keratitis in various studies.[5]

In developing countries, major risk factors differ from those in developed countries. The factors identified are, dust particles, trauma due to vegetative matter, bathing and face washing with contaminated water. This is increasingly being reported among non-contact lens wearer. Males between 31- 50 years of age are more affected than females. This is usually the working group and most of them are workers exposed to wet soil and stick injuries.[4,5,6]

On direct entry, amoebae become established as conjunctival flora and active trophozoites invade the corneal stroma over a period of weeks to months. The pathogenesis involves parasite-mediated cytolysis and phagocytosis of corneal epithelial cells.[7]

Indian studies show that prevalence rate varies from 1-3% among culture positive corneal ulcers.[3,5] Among the other causes of infective keratitis, bacteria (including nocardia sp) account for 33% , fungi for 34% , mixed infections for 2% and 29% of the cultures are sterile.[2,3,5]

Though 'contact lens use' is an important risk factor for developing Acanthamoeba keratitis, there is an increasing prevalence of this condition among non-contact lens users in developing countries.[4,6] Further the latter group has been associated with a worse outcome than the former group. This is attributed to initial mis-diagnosis as herpetic, bacterial or fungal keratitis, resulting in delay to definitive treatment in this group.[8] Therefore Acanthamoeba keratitis should be ruled out in all cases of infective keratitis. Cultures for the same can be set up with ease in any diagnostic laboratory.

In conclusion any patients suspected of microbial keratitis, unresponsive to

antibacterial and antifungal agents should be investigated for Acanthamoeba. Better still an index of suspicion for Acanthamoeba should be present in all cases of infective keratitis.

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High-concentration oxygen therapy in COPD

To add to the evidence, the first randomised trial of high-concentration versus titrated oxygen treatment in the pre-hospital treatment of AECOPD has been published.

There is now level-1 evidence that controlled oxygen therapy titrated to achieve oxygen saturations of 88-92% substantially reduces the risk of death associated with high-concentration oxygen treatment in AECOPD, and can now be considered the preferred therapeutic regimen, as recommended in the British Thoracic Society guidelines. However, two major obstacles to the implementation of this regimen exist.

However, in patients with chronic respiratory failure, a bronchodilator nebulisation driven by oxygen might result in a rise in $PaCO_2$ during the period of nebulisation. In a prolonged ambulance transfer, with repeated administration of nebulised bronchodilator, this might essentially result in continuous high-concentration oxygen therapy being delivered.

The jury is in-the routine use of high concentration oxygen therapy in AECOPD ***is contraindicated.*** The preferred initial regimen is to titrate oxygen treatment to achieve an oxygen saturation of 88-92%, thereby avoiding the risks of both hypoxaemia and hyperoxaemis.

Richard Beasley, Mitesh Patel, Kyle Perrin, B ronan O'Driscoll, The Lancet, 2011;378;969-967