ACANTHAMOEBA KERATITIS: RECOGNIZING IT AND TREATING IT

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ACANTHAMOEBA KERATITIS

• The referring physician first saw Billy for pain in the eye on Nov 29, 2007.

• He is a 42-year-old male with dry eyes.
Nov 29, 2007

- His vision was 20/80.

- The MD saw only redness and SPK.

- He prescribed Tobradex ointment and patched the eye.
Dec. 3, 2007

- Billy had removed the patch.
- The pain was much worse than on the 29th.
- VA was 20/400 with a large central epithelial defect.
- DX was floppy lid syndrome and a bandage contact lens was placed.
Billy’s right eye on December 3, 2007
Dec 6, 2007

- Vision drops to HM.
- Everything is worse:
  - Pain
  - Larger epithelial defect
  - Stromal haze
  - Increased redness
  - Central edema

He sends the patient to me.
Dec 7, 2008

- He arrives in my office with a painful, red, HM eye.
- At SLE I see:
  - A firm white base
  - No pus, no hypopyon
  - A 4 x 5 mm epithelial defect
  - A very red, angry eye.
Dec 7, 2008

• I write on my notes that this may not be infected, but I do a culture anyway.

• I ask him to stop his steroid and begin Tobradex ointment q. 3 hours.
Dec 10, 2007

• The culture grows Staph aureus and alpha hemolytic strep – both.

• I start him on gatifloxacin (Zymar) and vancomycin every hour.
Dec 11, 2007

• No change.

• Old axiom:
  – *If you have made the diagnosis and instituted the proper treatment and the patient is not improving – then the diagnosis is wrong.*
Confocal microscopy showed *acanthamoeba* cysts throughout cornea.

How embarrassing is it that I give lectures on *acanthamoeba*.
Jan 10, 2008

He was started on:
- Chlorhexidine drops 0.02%
- PHMB .01% drops
- Brolene drops
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• Billy had no risk factors
  – He did not wear contacts
  – He had no exposure to contaminated water
  – He had no corneal trauma
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- The organism exists in two forms:
  - Trophozoite – slowly motile
  - Cyst – has a thick double wall
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• Ubiquitous
  – Seawater, lakes, rivers, streams
  – Tap water
  – Bottled water
  – Drinking fountains
  – Eye wash stations
  – Dental units
  – Dialysis machines

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- The trophozoite transforms to cyst under adverse conditions:
  - Temperature changes
  - Desiccation
  - Food depletion
  - pH changes
  - Low oxygen concentration
  - Noxious medication
Contact lens wear

- Epithelial breaks
- Improper handling
- Amoeba adherence to the lens
- Contaminated lens care system
  - Home made saline
  - Amoeba need bacteria for food
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• Symptoms
  – Blurred vision
  – Severe pain
  – Photophobia
  – Tearing
  – Foreign body sensation
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• Signs
  – Elevated epithelial dendritiform lines
  – Gray-white infiltrate with epithelial defect
  – Ring infiltrate

– Most early cases of AK (70%) are misdiagnosed as herpes keratitis.
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- **Diagnosis**
  - Scraping and plating on *Escherichia coli*
  - *Scraping and staining with Calcofluor white*
  - *Scraping and staining with Diff-Quik*
    - Methanol fixation
    - Methylene blue
    - eosin
  - *Confocal microscopy*
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• Treatment
  – Propamidine (Broline) drops
  – Polyhexamethylene biguanide (PHMB) 0.02% drops
  – Neomycin

Treatment need to be pulsed
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- Risk factors are not required
- If it’s not getting better the diagnosis may be wrong
- Medication transforms the organism to cyst formation – therefore pulse treatment.
- To date, nowhere in the world are Acanthamoeba challenges included in approval of SCL disinfection products.
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• The number of AK cases is increasing
• The two standards for microbial challenge testing:
  – ISO/FDIS 14729
  – US FDA premarket notification 510(k)
• Neither require efficacy testing against acanthamoeba!
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- The use of hydrogen peroxide solution for SCL disinfection has been shown to produce greater kill rates of acanthamoeba than multipurpose solutions.
- Kill rates were highest for 6 hours (compared to 4 hours)

Dwight Cavanagh’s Editorial

- There is no approved drug for treating AK in the US.
- Confocal microscopy is rarely reimbursed.
- The FDA has set no standard to disinfection of cysts or trophs.

Recently the U.S. public health authorities have approved a decrease in public water chlorination.

This lead to an increase in AK in communities in Illinois where instituted.

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• FRUSTATINGLY our best defense against AK may be nothing better than patient education.