CLINICAL PRACTICE GUIDELINE: Emergency Department

Fungal Otitis Externa

Disclaimer: This Clinical Practice Guideline ('CPG') was written for use in The Royal Victorian Eye and Ear Hospital Emergency Department. It should be used under the guidance of an Ophthalmology or ENT registrar. If clinical advice is required, please contact the Eye and Ear Admitting Officer for assistance: EYE: +61 3 9929 8033; ENT: +61 3 9929 8032. Links to internal Eye and Ear documents cannot be accessed from the website CPG.

See also: Bacterial otitis externa, skull base osteomyelitis, cholesteatoma

Description:

Inflammation of all layers of ear canal epithelium secondary to fungal infection.

Red Flags:

- Consider malignant otitis externa (OE)/skull base osteomyelitis or neoplastic aetiology if:
  - Symptoms persisting despite management
  - Longstanding, severe pain out of proportion with appearance
  - Cranial nerve (CN) signs (the most commonly affected CN are VII, IX, X, XI, XII)
  - History of diabetes and/or immunodeficiency
- Consider pinna cellulitis or perichondritis if inflammation involves pinna

How to Assess:

History:

- Otalgia
- Otorrhoea
- Pruritis of the external ear canal (EAC)
- Decreased hearing
- Recent topical therapy for bacterial otitis externa
- History of swimming, cotton bud, hearing aids use, ear syringe
- Always enquire about treatment-modifying factors:
  - History of tympanic membrane perforation (TMP), grommets insertion
  - History of immunocompromise, diabetes, radiation to head and neck

Examination:

- Distinguish bacterial OE from fungal OE

Bacterial OE	Fungal OE
Very painful on pulling pinna, pressing tragus, and on otoscopy	Pruritus is predominant over pain, all manipulations are tolerable
Narrow, oedematous canal	Usually wide canal
Malodorous creamy or dry pus, yellow colour, desquamated canal	Debris is thick – "wet newspaper" (hyphae) and "salt and pepper" (spores)

Investigations:

- Microbiology swab if not resolving after initial presentation
- Consider investigation for diabetes

Acute Management:

A. Intact tympanic membrane and ear canal patent
   1. Aural toilet is the mainstay of treatment. Any hyphae/spores left may give a recurrence of fungal OE.
   2. Locacorten® Vioform (flumethasone pivalate 0.2 mg/mL and clioquinol 10 mg/mL) ear drops 3 drops TDS for 10 days
      or
   - Otocomb® or Kenacomb® ear drops (triamcinolone acetonide 1mg/ml, neomycin sulphate 2.5mg/ml, gramicidin 0.25mg/ml, nystatin 100,000 units/ml) 3 drops TDS for 10 days. Otocomb®/Kenacomb® ear drops are viscid and can themselves occlude the ear canal and can therefore reduce hearing. Additionally, their appearance can mimic active infection making assessment of otitis externa resolution more difficult.
     or
   - Otocomb Otic® or Kenacomb Otic® ointment may also be instilled into the ear canal using an ear suction cannula attached to a 2.5 ml Luer lock syringe. This option may be beneficial in those where compliance with medication may be an issue. However, subsequent aural toilet of residual ointment after 10 days by suction clearance is needed.
     Note: If drops are prescribed, advise on the right technique, i.e. warm the bottle of drops in palm for 5-10 mins prior to instillation, lie down with affected ear up, apply pumping action on the tragus[3] and stay with drops in for as long as possible (the best – sleep overnight). Better results may be seen if drops are instilled by another person.
   3. Oral analgesia, e.g. paracetamol, ibuprofen
   4. General practitioner (GP) review after above therapy at 7-10 days
   5. If symptoms and signs persist, perform a microbiology swab, continue topical drops and await microbiology results to consider revision of topical therapy.

B. Tympanic membrane perforation present
   1. Aural toilet
   2. There is currently no licensed antifungal topical therapy available in this scenario due to potential ototoxicity. However, there are only animal studies showing ototoxicity of topical antifungal with no human case reports available in the literature.

   Options in TMP are:
   - If perforation is small – Creams/ointments are viscous, so Clotrimazole cream 1% (or ointment) or Otocomb Otic®/Kenacomb Otic® may be instilled into the ear canal using an ear suction cannula attached to a 2.5 ml Luer lock syringe. Take care not to instill Clotrimazole/Otocomb Otic®/Kenacomb Otic® through the perforation and into the middle ear space.
   - If perforation is big – use same creams/ointment to paint the wall of ear canal**.**

   3. Outpatient ENT review in one week for aural toilet and reassessment of ear canal.
   4. GP review one week later to ensure infection settled.

C. Canal occluded due to oedema

1. Insert Pope ear wick.
2. Saturate wick with Locacorten® Vioform ear drops (usually 5 drops). Even if TMP is present but not visualized due to oedema, the transmission of LCV to the middle ear from a wick is minimal.
3. Next day commence Locacorten® Vioform 3 drops TDS
4. Outpatient ENT review after 2 days for wick removal and toilet. If improving and tympanic membrane seen and intact, continue drops until GP review after 10 days. If TMP is present, act as outlined (B) above.
5. If symptoms and signs persist, perform microbiology swab, aural toilet and review for revision of topical therapy.

Note: Systemic antibiotics are not indicated unless there is evidence of co-existing pinna cellulitis, perichondritis or otitis media.

Follow up:

- Urgent ENT opinion, if red flags present. Arrange ENT review if symptoms persist despite above management regimen or if tympanic membrane perforation persists beyond three months.
- No ear patient should be discharged from the Eye and Ear Hospital without tympanic membrane being visualized.

Discharge instructions:

- In order to reduce water entering the affected ear, advise patients when showering to block EAC with cotton wool ball with Vaseline® applied to its surface, while being careful not to insert the cotton wool deep into canal. Also, advise against swimming until the ear infection has resolved and has been cleared by clinical examination.
- Advise against inserting foreign objects into the EAC, e.g. cotton buds/hair clips as these can traumatise the EAC skin and cause otitis externa.

Additional notes:

Give patient copy of Otitis Externa Patient Information

Evidence Table

Author(s)	Title	Source	Level of Evidence (I – VII)
Flint, P.W., Haughey, B.H., Robbins, K.T., Thomas, J.R., Niparko, J.K., Lund, V.J. and Lesperance, M.M.	Cummings otolaryngology—Head and neck surgery 2014	Elsevier Health Sciences	**VII**
Johnson, J.	Bailey's Head and Neck Surgery: Otolaryngology 2013	Lippincott Williams & Wilkins	**VII**
Rosenfeld, R.M., Schwartz, S.R., Cannon, C.R., Roland, P.S., Simon, G.R., Kumar, K.A., Huang, W.W., Haskell, H.W. and Robertson, P.J.	Clinical Practice Guideline Acute Otitis Externa 2014	Otolaryngology--Head and Neck Surgery, 150(1 suppl), pp.S1-S24.	**I**
Herasym, K., Bonaparte, J.P. and Kilty, S.	A comparison of Locacorten-Vioform and clotrimazole in otomycosis: A systematic review and one-way meta-analysis 2016	Laryngoscope, 126(6):1411-9	**II**
Perez, R., Nazarian, Y., Sohmer, H. and Sichel, J.Y.	The effect of topically applied antimycotic agents on inner ear vestibular and cochlear function 2013	Laryngoscope, 123(4): 1033-1039	IV

The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynk and Fineout-Overholt (2011).

I) Evidence obtained from a systematic review of all relevant randomised control trials.

II) Evidence obtained from at least one well designed randomised control trial.

III) Evidence obtained from well-designed controlled trials without randomisation.

IV) Evidence obtained from well-designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case series.

V) Evidence obtained from systematic reviews of descriptive and qualitative studies.

VI) Evidence obtained from single descriptive and qualitative studies.

VII) Expert opinion from clinician, authorities and/or reports of expert committees or based on physiology.

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