Otitis Externa (Swimmer’s Ear) and Mastoiditis in Children — Symptoms and Treatment

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Acute otitis externa is defined as the inflammation of the external acoustic meatus and is usually of bacterial etiology in children. The most common causative organism is pseudomonas. Children usually present with ear pain, ear fullness, and ear discharge. The fever might be present. Recent prolonged exposure to water, such as partaking in aquatic activities, can be the predisposing factor for the development of acute otitis externa in a considerable number of cases. Children with acute otitis externa should receive oral analgesia in addition to topical antibiotic therapy. Ciprofloxacin or gentamicin eardrops can be used for the topical management of acute otitis externa in children, but gentamicin should be avoided in case of a perforated tympanic membrane. The prognosis of acute otitis externa is excellent with proper antibiotic therapy. Patients usually improve within 48 hours of antibiotic therapy initiation.
Overview

Acute otitis externa is an inflammation of the external acoustic meatus that is caused by an infection. The condition has been historically associated with prolonged water exposure; hence the name swimmer’s ear.

The most important risk factors for acute otitis externa in children are increased humidity, local trauma to the ear, the use of external devices and ear piercings and the development of atopic or contact dermatitis, or other allergic conditions that involve the skin of the external acoustic meatus.

Epidemiology of Acute Otitis Externa in Children

The estimated annual incidence of acute otitis externa in children aged between 5 and 14 years is 8.1 per 1,000. Seasonal variation in the incidence of acute otitis externa has been noted with a slightly higher incidence during summer.

The peak of incidence of acute otitis externa is reported to be in children aged between 7 and 12 years. In contrast to acute otitis media, the incidence of acute otitis externa in both sexes is equal.

The prognosis of acute otitis externa is excellent with proper antibiotic therapy. Patients usually improve within 48 hours of antibiotic therapy initiation. Patients with severe or malignant otitis externa might have extensive damage to the external ear and can have a bad cosmetic prognosis.

Pathophysiology of Acute Otitis Externa

While viral agents are responsible for about one-third of the cases of acute otitis media in children, viral agents are rarely implicated with acute otitis externa. Approximately, 90% of the cases of acute otitis externa are caused by bacterial pathogens.

The most common bacterial pathogen implicated with acute otitis externa in children is Pseudomonas species. Up to 38% of the cases of acute otitis externa are caused by a Pseudomonas species. The remainder of the cases is caused by staphylococcus species, anaerobes, and gram-negative organisms.

Children who develop a rebound acute otitis externa after topical antibiotic therapy usually have fungal acute otitis externa. The most common fungal etiology is Aspergillus.

For the bacteria to cause damage to the external ear, certain pathologic changes are required. The absence of cerumen within the ear canal is an important pathologic change that can predispose the child to develop acute otitis externa. This can result from excessive water exposure, such as participating in swimming or other aquatic activities, or over-cleaning of the ear canal. Trauma to the external ear and alteration of the pH of the ear canal can also predispose the child to acute otitis externa.

Increased moisture within the external acoustic meatus is believed to be the most important risk factor for acute otitis externa in children.
Clinical Presentation of Acute Otitis Externa in Children

Children who develop acute otitis externa usually present with ear pain, and ear fullness. Tenderness of the tragus and pinna, conductive hearing loss, erythema, and otorrhea are common findings on physical examination. Most cases of acute otitis externa are unilateral in children.

It is important to ask for a history of recent partaking in aquatic activities, such as swimming or surfing. Forceful ear cleaning and the use of cotton swabs can also be identified as a trigger for the development of acute otitis externa.

The most crucial difference on pneumatic otoscopy between otitis externa and acute otitis media is the preservation of the eardrum mobility in the former.

The ear discharge in acute otitis externa can point towards the most likely causative organism. Staphylococcus-caused acute otitis externa usually presents with purulent ear discharge, whereas pseudomonas-caused acute otitis externa can be present with yellow or green ear discharge.

Diagnostic Workup for Acute Otitis Externa in Children

Like acute otitis media, laboratory investigations are usually not needed in the diagnostic workup of acute otitis externa in children. The diagnosis is usually based on the presence of diagnostic clinical features on clinical examination, namely a tender tragus or pinna.

Children who fail to respond to antibiotic therapy should undergo gram staining and culture and sensitivity testing of the ear discharge to isolate and identify the causative organism of acute otitis externa.

Children with suspected mastoiditis should undergo high-resolution computed tomography scanning which can visualize bony erosion. Children with uncomplicated acute otitis externa do not need any imaging studies.

Treatment of Acute Otitis Externa in Children

Topical antibiotic therapy with neomycin or gentamicin ear-drops is indicated for the treatment of acute otitis externa in children. Ciprofloxacin and ofloxacin are also effective as topical therapies for the treatment of acute otitis externa.

Before the initiation of topical gentamicin ear-drops in children with acute otitis externa, the status and integrity of the tympanic membrane should be assessed with otoscopy. Aminoglycosides are contraindicated in children with a perforated tympanic membrane.

During the healing process, the child should avoid partaking in aquatic activities such as swimming. The use of cotton swabs should also be discouraged.

In addition to antibiotic therapy in children, children with acute otitis externa are usually in considerable pain and oral analgesia is usually needed. Acetaminophen or ibuprofen is safe and effective for pain management in acute otitis externa in children.
Recent studies have shown that the use of **topical steroids** in the management of acute otitis externa can fasten the healing process and decrease the symptoms. **Combination therapy of antibiotic-steroid eardrops** is considerably more effective than antibiotic therapy alone or antibiotic therapy combined with acetic acid. The choice of antibiotic should be based on the status of the tympanic membrane and the antibiotic hypersensitivity history from the child.

Children with severe and complicated otitis externa should receive **oral antibiotic therapy** rather than topical antibiotics. Additionally, children with a very thick ear canal discharge should receive **topical antibiotics via an ear conduit** to facilitate penetration.

**Prognosis of acute otitis externa**

The prognosis of acute otitis externa is excellent with proper antibiotic therapy. Patients usually improve within 48 hours of antibiotic therapy initiation. Patients with **severe or malignant otitis externa** might have extensive damage to the external ear and can have a bad cosmetic prognosis.

**References**


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