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Otitis Media: A Case Study
Overview of Otitis Media: Causes, Risk Factors, Clinical Manifestation, Management & Prevention

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Abstract: ***Otitis media or middle ear inflammation is a spectrum of diseases, including acute otitis media, otitis media with effusion and chronic suppurative otitis media. Otitis media is among the most common diseases in young children worldwide. Although otitis media may resolve spontaneously without complications, it can be associated with hearing loss and life-long sequelae. Adjunctive screening techniques for otitis media include tympanometry, which measures changes in acoustic impedance of the tympanic membrane /middle ear system with air pressure changes in the external auditory canal, and acoustic reflectometry, which measures reflected sound from the tympanic membrane. Most cases of acute otitis media improve spontaneously. Cases that require treatment may be managed with antibiotics and analgesics. This article will provide a detailed overview of otitis media, including its causes, risk factors, symptoms, diagnosis, treatment options, complications, prevention, and prognosis.***

Keywords: otitis media, ear disorders, ear effusion, suppurative otitis media, sequlae

1. Introduction

The middle ear is the space behind the eardrum, which is connected to the back of the throat by a passageway called the eustachian tube. Middle-ear infections are called otitis media; it can occur when congestion from an allergy or cold blocks the eustachian tube. Fluid and pressure build up, so bacteria or viruses that have travelled up the eustachian tube into the middle ear can multiply and cause an ear infection. Middle-ear infections are the most common cause of hearing loss. Middle-ear infections can also cause a perforation in the eardrum or spread to nearby areas, such as the mastoid bone.

2. Review of Literature

Rosenblut (2023) conducted a study to assess the frequency of acute otitis media in children < 24 months of age attending the emergency department of Hospital Sótero del Río (HSR) after the introduction of PCV-10. Register-based nested case-control study. Cases (n= 1907) were all children< 24 months of age with a clinical diagnosis discharge of AOM at the ED of HSR, and controls (n= 244,334) were all other children< 24 months of age attended at the same ED in the same time period, with any other discharge diagnosis. The data were obtained through HSR Statistical Service. In the study period, there was a mean of 30,695 children< 24 months managed each year at the ED of HSR. The percentage with AOM in the prevaccine period was 0.94% and in the postvaccine period was 0.62%, respectively (P= 0.026). Exposure to the PCV-10 was associated with a decreased risk to develop AOM in children< 24 months, with an odds ratio of 0.659 (95% confidence interval: 0.60–0.72). The study showed a significant decrease in the percentage and risk of AOM in children< 24 months of age who visited the ED of HSR after implementation of PCV-10.

Definition

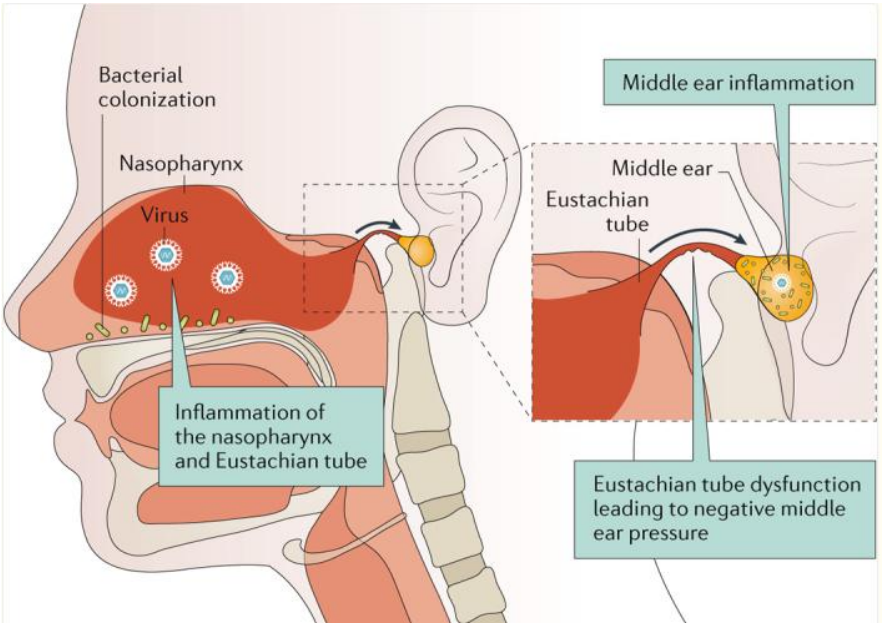
Otitis media is inflammation or infection located in the middle ear. Otitis media can occur as a result of a cold, sore throat, or respiratory infection.

Etiology

- Dysfunction of the Eustachian tube due to inflammation of the mucous membranes in the nasopharynx, which can be caused by a viral upper respiratory tract infection (URTI), strep throat, or possibly by allergies.
- A cold or allergy which can lead to swelling and congestion of the lining of the nose, throat, and eustachian tube (this swelling prevents the normal drainage of fluids from the ear)
- Allergic reactions, particularly to dust, pollen, or pet dander, can lead to inflammation and congestion in the Eustachian tube, contributing to fluid buildup in the middle ear and increasing the risk of infection.
- A malformation of the eustachian tube
- Common among children due to shorter eustachian tube
- Trauma to the tympanic membrane
- Head injury
- Barotrauma

Risk Factors

- **Age.** Children between the ages of 6 months and 2 years are more likely to get ear infections due to the size and shape of their eustachian tubes.
- **Group child care.** Children in group settings come into contact with more infections, such as the common cold.
- **Bottle feeding.** Babies who drink from a bottle tend to have more ear infections than do babies who breastfeed. This is especially true if they're given a bottle while in their cribs.
- **Seasons.** Ear infections are most common during the fall and winter. People with allergies during certain seasons might have a greater risk of ear infections when pollen counts are high.
- **Poor air quality.** Exposure around tobacco smoke or a lot of air pollution, have a higher risk of ear infections.
- **Cleft palate.** The bones and muscles in the faces of children who have cleft palates can make it harder for the eustachian tube to drain.



Classification

Otitis media can be classified into three main types based on its duration and severity:

1) **Acute Otitis Media (AOM)**: A sudden onset of ear pain, often accompanied by fever, fluid drainage, and hearing difficulties.
2) **Otitis Media with Effusion (OME)**: In this condition, fluid accumulates in the middle ear without infection. It may follow an acute infection or occur in the absence of an active infection.
3) **Chronic Otitis Media (COM)**: This refers to a persistent or recurrent ear infection that lasts for more than three months. It may lead to long-term complications, such as hearing loss.

Clinical Manifestation

- **Ear Pain**: The most common symptom of otitis media is ear pain, which may be mild to severe. The pain can be persistent or intermittent and may worsen when lying down or touching the ear.
- **Hearing Loss**: Fluid buildup in the middle ear can cause temporary hearing loss, which may be noticeable as a sensation of muffled sounds. In chronic cases, hearing loss can persist.
- **Fluid Drainage**: Drainage from the ear is a common symptom of otitis media, especially if the eardrum ruptures or if there is an active infection. The fluid may be clear or contain pus.
- **Fever**: Fever may accompany otitis media, especially if there is a bacterial infection. The fever is typically low-grade but can rise in more severe cases.
- **Irritability and Fussiness**: In young children, irritability, crying, and difficulty sleeping may be signs of ear pain associated with otitis media. Infants and toddlers may tug at their ears in response to the discomfort.
- **Loss of Appetite**: Ear pain can make swallowing uncomfortable, leading to a decreased appetite, especially in children.
- **Balance Problems**: The middle ear plays a key role in balance, so an infection may cause dizziness or problems with coordination.

Diagnostic Evaluation

- **Tympanometry**: This test measures the movement of the eardrum in response to changes in air pressure. It helps determine if there is fluid in the middle ear, which is characteristic of otitis media.
- **Audiometry**: In cases of hearing loss, an audiology test may be conducted to assess the degree of hearing impairment caused by the infection.
- **Culture of Ear Fluid**: If there is drainage from the ear, the fluid may be cultured to identify the specific bacteria or virus causing the infection. This helps guide treatment, particularly in cases of chronic or recurrent otitis media.
- **Imaging Studies**: In severe or recurrent cases, imaging studies such as a CT scan may be used to assess the extent of the infection and check for complications, such as an abscess or bone infection.

Case Study of Mr. X

A 35 years old male has been admitted in hospital with the complaints of fever, hearing loss and otalgia in the left ear for 7 days. After detailed investigation he was diagnosed as otitis media.

Medical Management:

- **Antibiotics**: Amoxicillin is often prescribed for bacterial otitis media. If the infection persists or is caused by a resistant bacterium, stronger antibiotics may be needed.
- **Analgesics:** Over-the-counter pain relievers, such as acetaminophen and ibuprofen to relieve ear pain and reduce fever.
- **Warm compresses** for soothing.
- **Ear Drops**: Otinex ear drops to relieve ear pain and inflammation.

Surgical Management:

- Myringotomy
- Myringoplasty

Non-Pharmacological Management:

- **Rest and Hydration**: Rest and maintaining proper hydration can help the body recover from an infection.

Drinking plenty of fluids can also help soothe a sore throat or congestion that may accompany otitis media.
- **Avoiding Irritants**: Avoid exposure to second hand smoke or allergens, as these can worsen ear infections and contribute to recurrent otitis media.

Complications
- Hearing loss
- Delays in speech or development
- Perforation of the eardrum

Prevention
- **Prevent colds and other illnesses.** Teach children to wash their hands often and well. Tell children not to share cups, forks and spoons. Teach children to cough or sneeze into their elbows.
- **Avoid second hand smoke.** Make sure that no one smokes in your home. Away from home, stay in places that are smoke-free.

3. Conclusion

Otitis media is a common and treatable condition but it requires prompt attention to prevent complications such as hearing loss and chronic infections. Preventive measures, such as vaccinations and good hygiene, can help reduce the risk of ear infections.

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