

Otitis Media Complications: Labyrinthitis

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Abstract

Background: Otitis media is an inflammation of part or all of the middle ear mucosa, eustachian tube, mastoid antrum and mastoid cells. Otitis media has many complications, one of which is extra-cranial complications such as labyrinthitis. **Objective:** To know more about labyrinthitis and how to treat patients with labyrinthitis in otitis media. **Method:** This article was written using various sources from scientific journals and medical e-books. Source searches are carried out on the online portal of journal publications such as pdf drive, National Centre for Biotechnology Information/NCBI. **Result and Discussion:** Labyrinthitis is an inflammatory condition that occurs in the membranous labyrinth of the inner ear which is usually accompanied by vertigo, nausea, vomiting, tinnitus, and hearing loss to hearing loss. Treatment of labyrinthitis caused by viral in outpatients can be done by meeting fluid needs and adequate rest. In labyrinthitis caused by bacteria, topical antibiotic drops should be prescribed. **Conclusion:** Labyrinthitis is an inflammatory condition that occurs in the membranous labyrinth of the inner ear. Patients with labyrinthitis are usually accompanied by vertigo, nausea, vomiting, tinnitus, and hearing loss to hearing loss. The causes themselves are very diverse, such as viruses, bacteria, autoimmune, and even syphilis.

Keywords: otitis media; labyrinthitis; complication;

Introduction

The incidence of otitis media in the world is estimated to have an average of 10.8 new incidents per 100 people per year in AOM cases (Kvørner et al. 1996). This figure ranges from an average of 3.6 for Central Europe to an average of 43.4 for Sub-Saharan West Africa and Central Africa, reflecting that the burden of OMA varies by economic status. Cohort studies conducted on children in developing countries in the 1980s and 1990s showed that OME was common in children aged 1 year to 3 years, where almost all children had experienced OME at least once (Bern et al. 1992). For CSOM the average global incidence rate is estimated at 4.8 new incidents per 1,000 people per year and most occur in the first year of life (Schilder et al. 2016). In Indonesia, a study conducted on 7005 children found 116 had CSOM, 30 had AOM and 26 had OME. The incidence of CSOM in Indonesia is more common in rural areas than in urban areas (Anggraeni et al. 2014). Otitis media has many complications, one of which is extracranial complications in the form of labyrinthitis (Jang, Park, and Wang 2005).

Metode

This article was written using various sources from scientific journals and medical e-books. Source searches are carried out on the online of journal publications such as pdf drive (<https://www.pdfdrive.com/>), National Centre for Biotechnology Information/NCBI (<https://www.ncbi.nlm.nih.gov/>).

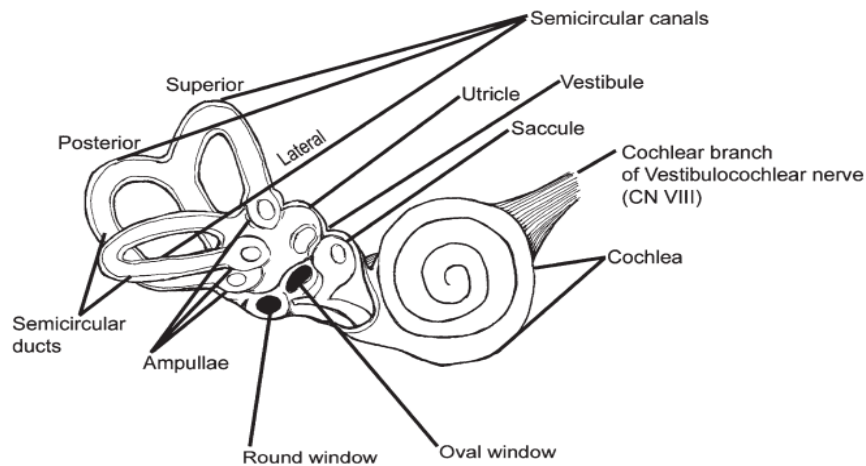
Literature Review

Definition and Epidemiology

Labyrinthitis is an inflammatory condition that occurs in the membranous labyrinth of the inner ear which is usually accompanied by vertigo, nausea, vomiting, tinnitus, and hearing loss to hearing loss (Barkwill and Arora 2021). This complication of otitis media occurs when the infection spreads into the cochlea and vestibular apparatus. Invasion can occur from focal infection in adjacent areas, such as the mastoid antrum, petrous bone, meninges, or as a result of bacteremia (Bluestone, Healy, and Simons 2014).

Research on the incidence and prevalence of labyrinthitis has not been done much. However, it is known that in South Korea, the prevalence of vestibular dysfunction varies from 3.1% to 35.4%, and the incidence increases with age. Viral labyrinthitis is the most common form and is usually secondary to an upper respiratory tract infection. It usually appears in adults aged 30-60 and is twice as common in women. Suppurative bacterial labyrinthitis, as a complication of bacterial meningitis, is the most common cause of deafness in children under 2 years of age, however, it is becoming less and less common in the post-antibiotic era. Otogenic suppurative labyrinthitis can occur at any age and is usually found in cholesteatoma or secondary to untreated otitis media (Barkwill and Arora 2021).

Anatomy



Source: Anatomy of the vestibular system (Khan and Chang 2013).

The inner ear consists of two structures, the bony labyrinth, and the membranous labyrinth. The bony labyrinth is a collection of bony cavities located within the temporal bone of the skull. The bony labyrinth has three main sections, the vestibule, the cochlea, and three semicircular canals. These three structures contain a substance known as perilymph. The membranous labyrinth is located within the bony labyrinth and consists of four structures namely the saccule, utricle, semicircular duct, and cochlear duct. These four structures are filled with a substance known as endolymph. The inner ear itself has two connections with the middle ear and two connections with the central nervous system. The oval window connects the vestibule to the middle ear, and the round window connects the cochlear duct to the middle ear. While the internal auditory canal and cochlear aqueduct connect the inner ear and the central nervous system (CNS) (Barkwill and Arora 2021).

Etiology and Pathophysiology

Causes Labyrinthitis is most commonly classified either by the mode of spread (tympagogenic, meningogenic, hematogenic, posttraumatic) or by the causative agent (viral, bacterial, autoimmune, syphilis) (Bunch & Kelly, 2019). Labyrinthitis that occurs due to the spread of otitis media infection is known as tympanogenic labyrinthitis and is often unilateral. Tympanogenic labyrinthitis is initiated by the spread of acute or chronic otitis media infection to the inner ear through the oval or round windows. Labyrinthitis that occurs can be serous and suppurative (Germiller, 2007).

Clinical Manifestations

Clinical manifestations that appear can be:

- Nausea
- Vomiting
- Vertigo
- Loss of balance

- Tinnitus
 - Hearing loss
- (Barkwill and Arora 2021).

Diagnosis

The audiometric examination may be performed to confirm examination findings and assess the extent of sensorineural hearing loss. If the patient comes with severe vomiting, laboratory tests in the form of a urea and electrolyte panel need to be replaced with electrolytes. If the patient is suspected of having bacterial meningitis then a CSF culture should be performed. Also, consider having HIV and syphilis serologic tests. MRI/CT images can be useful in assessing whether an acoustic neuroma is present (Barkwill and Arora 2021).

Management

Treatment for labyrinthitis caused by otitis media usually begins with establishing a drainage route and obtaining a purulent culture; Appropriate antibiotic therapy is then administered later. Myringotomy and insertion of a ventilation tube should be performed in patients with clear evidence of serous labyrinthitis associated with otitis media (Jang, Park, and Wang 2005).

The management of labyrinthitis caused by viral in outpatients can be done by meeting fluid needs and adequate rest. However, patients are advised to seek medical attention if their symptoms worsen, or they develop neurological disorders (eg, weakness/numbness, diplopia, slurred speech, and gait disturbances) (Barkwill and Arora 2021).

In labyrinthitis caused by bacteria, topical antibiotic drops should be prescribed. Ears should be cleaned if the patient has purulent otorrhoea or tympanic membrane perforation. However, if the patient has systemic symptoms, consider oral or even intravenous antibiotics, depending on the severity of the infection (Barkwill and Arora 2021).

Complications

Complications that may occur in patients include hearing loss, tinnitus, if not treated effectively it can develop into mastoiditis, and in rare cases, a labyrinthectomy may be required due to a cholesteatoma (Barkwill and Arora 2021).

Prognosis

Acute vertigo in labyrinthitis can be managed within a few days but mild symptoms may persist for several weeks. If the patient does not have serious problems with neurologic sequelae, the patient's prognosis is usually good. However, suppurative labyrinthitis tends to cause permanent hearing loss (Barkwill and Arora 2021).

Conclusion

Labyrinthitis is an inflammatory condition that occurs in the membranous labyrinth of the inner ear. Patients with labyrinthitis are usually accompanied by vertigo, nausea, vomiting, tinnitus, and hearing loss to hearing loss. The causes themselves are very diverse, such as viruses, bacteria, autoimmune, and even syphilis. Complications that can be caused include hearing loss, tinnitus, mastoiditis, and even permanent hearing loss.

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