MAT JOURNALS

Journal of Nursing Research, Education and Management
Volume 1 Issue 1

Ottis Media

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Abstract

Ottis media is an anomaliy happening in the middle ear. Basically ottis media can be clinically manifestated as a condition of ear where it is infested with bacteria or virus. The major objective of this paper is to understand about the characteristics and clinical implications of the disease.

Keywords: *Clinical manifestations, middle ear, ottis media, bacteria, virus*

INTRODUCTION

Acute otitis media (AOM), a viral or bacterial infection of the middle ear, is the common infection for which antibiotics are prescribed for children in the United States [1]. Direct and indirect costs of treatment and time lost from school and work because of acute otitis media totalled nearly $3 billion in 1996 Acute otitis media is most common between six and 24 months of age; by age three, more than 80 percent of children have been diagnosed. Otitis media with effusion is middle ear effusion in the absence of acute infection. About 2.3 million cases of otitis media with effusion occur annually in the United States. Chronic supportive otitis media is persistent infection and typically resultant perforation of the tympanic membrane [2].

Pathophysiology

Genetic, infectious, immunologic, and environmental factors predispose the children to ear infections .In most cases, an allergy or the upper respiratory tract infection causes congestion and swelling of the nasal mucosa, nasopharynx, and eustachian tube [3]. Obstruction at the eustachian tube isthmus (i.e., the narrowest portion) results in the accumulation of middle ear secretions; secondary bacterial or viral infection of the effusion causes suppuration and features of acute otitis media. The effusion may persist for few weeks or months after the infection resolves. Otitis media with effusion may occur spontaneously as a result of eustachian tube dysfunction or as an inflammatory response after acute otitis media [4].

Diagnosis of AOM

Additional researches are needed to more fully understand the precision of the current diagnostic criteria for AOM: acute onset of signs and symptoms, MEE, and middle ear inflammation [5]. For example, although it has been determined and assessed that all three are necessary for a diagnosis of AOM, evidence is insufficient to guide clinicians on the most effective and efficient ways to assess each of these elements in the clinical setting. Also needed are more research in depth that use a reference standard that can take into account all three criteria of an AOM diagnosis and analysis. Thus, a reference standard that takes into account only the MEE does not provide sufficient evidence on overall diagnostic accuracy for AOM [6].

Influence of the PCV7 Vaccine on Microbiology/Epidemiology

Researchers are needed to address the implications of the observed evolution in

microbiology subsequent to introduction of the PCV7 vaccine [7]

More inquiry is needed into microbiologic shifts in Acute otitis media- AOM, especially as it relates to resistance patterns of the non-PCV7 serotypes of SP that seem to be increasing since the introduction of PCV7. Such research will require continued surveillance of both shifts in the causative organisms of Acute otitis media (AOM) and in the antibiotic resistance/susceptibility of these organisms [8].

Recent investigations of a single paediatric practice, not meeting our inclusion criteria, found evidence suggesting that an increase in the proportion of AOM with non-vaccine SP serotypes may be paving to another shift in AOM microbiology. These new information support the need for ongoing surveillance of AOM isolates.

Continued surveillance will also help us to really understand the impact of new pneumococcal vaccines that include more serotypes than PCV7 currently does, such as the newly-licensed PCV13. It will be pivotal to have information to help conduct cost-benefit analysis of vaccines that cover more than the current seven serotypes. A growing body of the study in assessing the efficacy of the vaccine in preventing AOM.

Treatment Efficacy and Adverse Effects

Research issues identified in the original AOM research are still applicable, it relates to treatment of uncomplicated AOM as well as to treatment of ROM, which was not previously addressed and discussed. Though the researchers assess several definitive conclusions, the usefulness of these conclusions to the practitioner is limited because of concerns regarding the internal validity of some of the source research and the generalizability of the findings because of differences in the definitions of AOM and ROM—as well as treatment outcomes—across studies; the variability of research quality; and the relative paucity of evidence rakished to influencing factors such as characteristics of AOM including severity, the patient, the environment, and the healthcare delivery system. Standard definitions of the AOM and ROM that lead to standard diagnostic criteria and that are acceptable to both researchers and practitioners have not been typically developed since the initial review and are still needed [9]. The continued diversity of the definitions for AOM as well as for ROM and, therefore, the diversity of diagnostic criteria that control entry of participants into these treatment trials make it difficult to produce and generalize findings, as it is unclear if the same condition is being assessed across studies. Greater knowledge regarding the effect of the children‘s age on the operating characteristics of diagnostic criteria will also help to assess results of studies comparing treatment options, e.g., by clarifying whether the children of different ages who have been diagnosed with and are being treated for AOM truly have the condition. In addition, improved knowledge of much of the effect of tympanostomy tube presence on these diagnostic operating characteristics will help to better assess the true impact of tympanostomy tubes on the prevention of AOM in children with ROM [10].

Acute Otitis Media

This is an acute infection/inflammation of the middle ear mucosa which also involves the mastoid air cells most often. AOM is predominantly a childhood infection without sex preponderance and 76% of the few adults who have this condition are young adults below 44 years of age [11]

Etiology

Global reports and records show that Hemophilus influenza and Streptococcus

pneumonia are the most prevalent organisms responsible for AOM. However, most investigations from different parts of Africa suggest a different bacteriology spectrum. However, Staphyloccocus aureus and Streptococcus pyogenes appear to be the most dominant causative organisms among Africans, generally sensitive to penicillin based antibiotics, Cephalosporins, and Quinolones. In recent studies researchers demonstrated that most cases of AOM consist of melanged infection of bacteria and virus; with about 60% of the viruses belonging to the piconavirus spp [12]

Clinical features

The clinical mode of presentation is generally systemic (generalized) and local (ear) symptoms and signs. The typical picture is a child with high-grade fever (40–42°C), refusal of feeds, incessant cries and irritability (Fig: 1). There is associated ear pain (otalgia) and sometimes noise in the ear (tinnitus) with difficulty in hearing (conductive hearing loss). Ear discharge is seen in well above 91% of cases in some parts of the developing world, whereas it is only about 12% among the developed nations. Delay of presentation to the clinician most probably accounts for this disparity. Other clinical features and manifestations which are detected via otoscopy include hyperemic tympanic membrane Moreover, the discharge may be mucopurulent or purulent and appears to be pulsating in synchrony with the patient's pulse during active discharge from the point of tympanic membrane perforation on otoscopy.

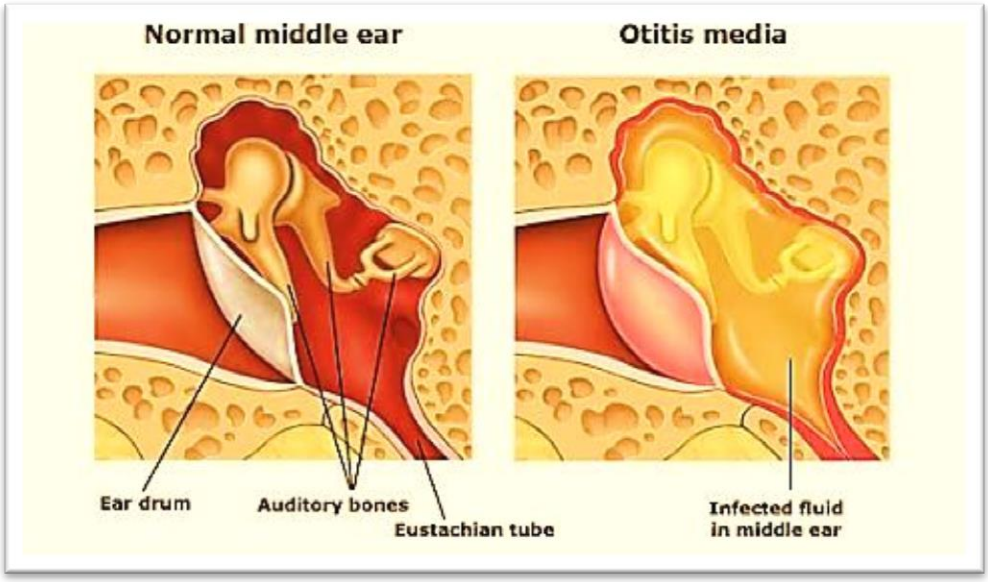

Fig: 1. *Otitis media*

Sequelae

The inflammation may resolve the following appropriate measures such as administration of suitable antibiotics or evacuation of the exudates within the middle ear through spontaneous or guided rupture of the tympanic membrane. On the other hand, the disease process may typically progress to complications in the presence of poorly treated or untreated virulent organisms. Spread of disease beyond the confines typically of the middle ear can result in extracranial or intracranial complications. Acute mastoiditis (inflammation of the mastoid air cells)/ coalescent mastoiditis, subperiosteal abscess, facial nerve paralysis, labyrinthitis and petrositis are

the examples of such extracranial complications, whereas the intracranial ones include extradural and subdural abscesses, meningitis, otitic brain abscesses, otitic hydrocephalus and lateral sinus thrombosis [13]

Management

Ear swabs for discharging ears are taken for the microcopy, culture and sensitivity test prior to commencement of broad-spectrum oral and or topical antibiotics. This is generally guided by the knowledge and behaviour of predominant causative agents within a given environment. Although a school of thought argues against the use of antibiotic therapy for AOM fundamentally based on the notion that most are allied with viral infections, however, the experience within the developed and developing world has suggested that most of the cases are either melanged. Otitis media in a resource-poor country viral) or bacterial infections. Some native cultural practices and the humid environment of the tropics majorly encourage secondary bacterial infections. A daily aural toileting of the ear is necessary for the discharging ear. Myringotomy to evacuate the exudates and cerumen in bulging tympanic membrane(TM) is encouraged prior to management with antibiotics. Adequate analgesia to reduce otalgia is valuable in the management of AOM. Imaging may be necessary, majorly in suspected cases of complications. In addition, the relevant ancillary investigations like complete blood count, urea and electrolytes should be carried out for optimization of the patients who may require surgery under anesthesia. Complications are managed accordingly. Appropriate exploratory and decompression surgeries such as the mastoidectomies, facial nerve decompressions, craniotomies for intracranial abscesses evacuations, etc. under adequate antibiotic cover are generally indicated [14].

Otitis Media with Effusion

This is a pathological state characterized by the accumulation of fluid (non-purulent) within the middle ear cleft with an intact tympanic membrane. Most frequently, the fluid is a mucus and thick, but sometimes serous and thin in consistency. OME has been referred to as “glue ear”, “mucoid otitis media”, “secretory otitis media” and “serous otitis media”. The pathogenesis of this phase is thought to be double pronged: Initially, from Eustachian tube disorder, which results in poor aeration of the middle ear and poor drainage of secreted fluids. Secondly, it could result from the hyperactivity of the middle ear gland which leads to excessive accumulation of the mucus secretions. Histological evidence has shown an increase in the number of the mucus or serous-secreting cells in such situations. Just like AOM, OME is predominantly a childhood problem. About 85% of cases of OME occur in children, making it a rare disorder in adults. In contrast, however, OME has been reported to show some racial bias. It is most common among the Caucasians, especially Canadian, Australian Aboriginals and Native American children compared to Africans [15]

Etiology

There is quiet a variation in the etiology in children and adults [16]**.** Eustachian tube dysfunctions from the adenoid enlargements, upper respiratory tract infections, congenital defects (e.g. cleft lips and palates) are common etiological factors in children, whereas allergy, barotraumas, nasopharyngeal tumors and rhinosinusitis are allied with OME in adults. Other factors that could be predisposing to OME include prolonged nasotracheal intubation, head and neck surgeries like maxillectomy, radiotherapy of the head and neck and immunodeficiency disorders like multiple myeloma, cystic fibrosis and HIV/AIDS [17].

Clinical features

OME generally presents with conductive hearing loss. The magnitude of hearing loss is normally mild to moderate (≤40 dB). It is usually most prevalent in children below 5-6 years of age. Sometimes the hearing loss may be typically detected incidentally during routine audiometric evaluations (e.g. preschool age screening tests) [18]. Pressure effects of the effusion could give rise to otalgia (ear pains). Moreover, very early onset of OME can give rise to speech difficulties since the child requires proper hearing for speech acquisition. The otoscopic studies include intact but dull tympanic membrane lacking in the light reflex, with obvious restrictions in mobility. The appearance may range from brown to yellow. The tympanic membrane may show the fluid level and/or air bubbles if the effusion is serous and the TM translucent. It might appear bulgy. On the contrary, the TM may exhibit a certain degrees of retractions when there is a scanty viscous fluid within the middle ear [19].

PERSISTENT OR RECURRENT AOM

Children with persistent, significant AOM symptoms despite at least 24 to 72 hours of antibiotic therapy should be re-examined. If a bulging, inflamed tympanic membrane is observed, therapy should be altered to a second-line agent. For children initially on amoxicillin, high-dose amoxicillin/clavulanate is also recommended. For children with an amoxicillin allergy typically do not improve with an oral cephalosporin, intramuscular ceftriaxone, clindamycin, or tympanocentesis may be considered. If symptoms recur more than one month after the initial diagnosis and analysis of AOM, a new and unrelated episode of AOM should be assumed [20].

For children with recurrent AOM (i.e., three or more episodes in six months, or four episodes within 8-12 months with at least one episode during the preceding six months) with middle ear effusion, tympanostomy tubes may be considered to decrease the need for systemic antibiotics in favor of observation, or topical antibiotics for tube otorrhea [21]. Furthermore, tympanostomy tubes may aggrandize the risk of long-term tympanic membrane abnormalities and decreased hearing compared with medical therapy. Other strategies may mainly help prevent recurrence. Probiotics, particularly in infants, have been majorly suggested to reduce the incidence of infections during the first year of life. Although available evidence has not been quietly demonstrated that probiotics prevent respiratory infections, probiotics do not cause adverse effects and need not be discouraged. Antibiotic prophylaxis is not recommended [22].

Management of OME

Two rare complications of OME are transient hearing loss potentially allied with language delay, and chronic anatomic injury to the tympanic membrane requiring reconstructive surgery. Children should be screened for speech delay at all visits and observations [23]. If a developmental delay is apparent or middle ear structures specifically appear abnormal, the child should be referred to an otolaryngologist. Antibiotics, decongestants, and nasal steroids do not hasten the clearance of middle ear fluid and are they not recommended [24]

Tympanostomy Tube Placement

Tympanostomy tubes are appropriate for children six months to 12-13 years of age who have had bilateral OME for three months or longer with documented hearing [25]

EXAMINATION OF THE TM

Accurate diagnosis of AOM in infants and young children may be quiet difficult. Symptoms may be mild or overlap with

those of an upper respiratory tract illness [26]. The TM may be typically obscured by cerumen, and subtle changes in the TM may be difficult to discern. Additional factors complicating diagnosis may encompass lack of cooperation from the child; less than optimal diagnostic equipment, including lack of a pneumatic bulb; inadequate instruments for clearing cerumen from the external auditory canal; inadequate assistance for restraining the child; and devoid of experience in removing cerumen and performing pneumatic otoscopy [27]. The pneumatic otoscope is the standard tool availed in diagnosing OM. Valuable also is a surgical head, which specifically facilitates cleaning cerumen from an infant's external auditory canal. Cerumen may be removed by availing a curette, gentle suction, or irrigation [28]. The pneumatic otoscope should have a light source of sufficient brightness and an air-tight seal that typically permits application of positive and negative pressure [29]. In general, non-disposable specula achieve a better seal with less pain because of a thicker, smoother edge and better light transmission properties. The speculum size should be chosen quiet gently to seal at the outer portion of the external auditory canal. Pneumatic otoscopy permits assessment of the contour of the TM (normal, retracted, full, bulging), its color (gray, yellow, pink, amber, white, red, blue), its translucency (translucent, semiopaque, opaque), and its mobility (normal, increased, decreased, absent). The normal TM is translucent, pearly gray, and has a ground-glass appearance. Specific landmarks can be typically visualized. They comprise the short process and the manubrium of the malleus and the pars flaccida, located superiorly [30]. These are easily observed and aid to identify the position of the TM. Inward movement of the TM on positive pressure in the external canal and outward movement on a negative pressure should occur, especially in the superior posterior quadrant. When the TM is retracted, the short phenomena of the malleus become more prominent, and the manubrium appears shortened because of its change in position within the middle ear. Inward motion occurring with positive pressure is restricted or absent, because the TM is frequently as far inward as its range of motion allows [31]. Furthermore, outward mobility can be visualized when negative pressure is applied. If the TM does not move perceptibly with applications of gentle positive or negative pressure, MEE is likely. Sometimes, the application of pressure will make an air-fluid interface typically behind the TM (which is diagnostic of MEE) more evident [32].

CONCLUSION

This paper garners information regarding the clinical characteristics of otties media. The pathophysiology causes of middle ear inflammation, acute ottis media, the sign and symptoms and diagnosis procedure.

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