CASE ANALYSIS

My Ear Hurts: Otitis Media in the Oncology Setting

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As an advanced practice nurse, you care for patients who have a variety of chronic conditions, and you are expected to handle them all. How do you keep up with all of the advances in cardiology, endocrinology, gastroenterology, and infectious disease? You read this column, dedicated to managing a variety of primary care disorders in conjunction with cancer treatment. If you have developed expertise in management of one or more chronic diseases, consider writing for this column. Contact Associate Editor Joyce Marrs, MS, APRN-BC, OCN®, AOCNP, via e-mail at joycemrn@sbcglobal.net.

Case Study

J.T., a 57-year-old man, presented to the clinic for follow-up of squamous cell carcinoma of the right pyriform sinus. He completed radiation therapy and chemotherapy with 5-fluorouracil and cisplatinum three months ago. Today, he complains of an upper-respiratory infection and pain in his right ear during the past three days. He states that he was unable to sleep last night because of the pain and worries his cancer has recurred.

Physical examination findings include normal vital signs, tender maxillary sinuses bilaterally, a slightly erythematous pharynx, and a dull right tympanic membrane (TM) with diminished light reflex. The left tympanic membrane is scarred, erythematous, bulging, and without a light reflex. The assessment is acute otitis media (OM) with effusion.

Case Discussion

OM is defined as an infection of the middle ear with or without effusion. It must be taken to determine the etiology and proper treatment. AOM occurs because of eustachian tube dysfunction, which prevents drainage of middle ear fluid. This usually is a result of a preceding event such as an upper-respiratory infection, causing inflammation and obstruction of the eustachian tube and the middle ear. Resultant negative pressure often will pull fluid further into the middle ear and provide a rich environment for pathogens to grow (Eason, 2005).

OME occurs when the eustachian tube loses its patency, causing negative pressure and effusion behind the TM. Persistent fluid in the middle ear will result in decreased mobility of the TM and interfere with sound conduction (AAFP et al., 2004). OME usually follows AOM, allergic rhinitis, or upper-respiratory infection (Mercy, 2000). OME is found in nearly 40% of patients with nasopharyngeal cancer before treatment, and an additional 16% of patients undergoing radiation therapy for head and neck malignancies will have acute OM (Baizer et al., 2000).

Pathophysiology

The middle ear contains the tympanic cavity, where three ossicles (hammer, anvil, and stirrup) transmit the vibration of the TM to the inner ear. The eustachian tube connects the middle ear with the thorax. It is usually flat and closed and opens briefly with swallowing and yawning, thereby equalizing the pressure in the middle ear with the atmospheric pressure. Equalized pressure permits the TM to vibrate freely (Ludwig-Beymer, Heuther, & Schoessler, 1994).

AOM and OME can affect patients of all ages but occurs most often in the pediatric population, especially in children younger than three years (Eason, 2005). AOM is the most frequently occurring bacterial illness in children, accounting for 50% of all antibiotics prescribed for preschoolers (AAP, 2004). Ninety percent of children have OME at some time before age six (AAFP et al., 2004). Either AOM or OME can occur in adults, but the incidence declines as patients age.

In the pediatric oncology setting, AOM is one of the most common types of infection diagnosed (Auletta, O’Riordan, & Nieder, 1999). Common childhood infections in pediatric oncology settings occur in large numbers, regardless of diagnosis, disease state, and neutropenic status (Auletta et al.). AOM and OME can occur in any patient with cancer, adult or child alike, and care must be taken to determine the etiology and proper treatment.
middle ear symptoms, including AOM and OME. Permanent changes rarely occur, but if the TM should fibrose or the ossicles necrose, conductive deafness or profound loss of hearing may result (Jereczek-Fossa, Zarowski, Milani, & Orecchia, 2003).

The most common bacterial pathogens include Streptococcus pneumoniae (40%–50% of cases), Haemophilus influenzae (20%–30%), and Moraxella catarrhalis (10%–15%). Penicillin-resistant S. pneumoniae is becoming more common (8%–34%) (Eason, 2005). Viruses may account for many cases of AOM and OME.

**Signs and Symptoms**

AOM may present in patients with a history of otalgia that can range from mild to severe. Fever, hearing loss, tinnitus, vertigo, sore throat, rhinitis, nystagmus, lethargy, irritability, nausea, vomiting, diarrhea, and anorexia also may occur (Eason, 2005). Infants or young children may pull at their ears. Patients with OME may present with a history of otalgia, fullness in the ear, sleep disturbance, hearing loss, and behavior changes, and may pull at their ears (Eason). Patients' history should include cancer and cancer treatment; current medications (both prescribed and over-the-counter); precipitating factors; onset, location, and duration of symptoms; associated symptoms; changes in activities of daily living; and recent upper-respiratory infection, AOM, or changes in weight. Five to seven days of therapy may be adequate in patients older than six years without complications such as a TM perforation. High-dose therapy with amoxicillin, amoxicillin-clavulanate, cefuroxime axetil, or intramuscular ceftriaxone should be considered in children who have received antibiotics in the past three months and/or attend day care because of the increased risk for penicillin-resistant S. pneumoniae (Albrant, 2000). If patients do not improve in 48–72 hours, compliance or treatment failure should be considered (AAP, 2004). If compliance is confirmed, then a different antibiotic should be prescribed. However, healthcare providers must remember that clinical symptoms of AOM still may be present, even with effective treatment, because of middle ear effusion. Worsening of fever or otalgia may be the only indication that the prescribed antibiotic is ineffective (Albrant). Amoxicillin-clavulanate could be considered in severe cases or in cases of antimicrobial resistance (AAP).

If a patient is allergic to penicillin but not sulfa, then trimethoprim and sulfamethoxazole or erythromycin and sulfisoxazole are two options that are appropriate for empiric treatment for AOM (Albrant, 2000). If a patient is allergic to penicillin and sulfa, a macrolide or a cephalosporin may be prescribed. Because of reports of cross-sensitivity between penicillins and cephalosporins, caution is advised in those with severe allergic reactions to penicillin.

For patients with perforated TMs or tympanostomy tubes and who are older than one year, ofloxacin otic solution may be appropriate. This should be administered twice a day for 10–14 days (Fang, 2004). Interestingly, about 80% of cases of AOM will resolve without antibiotics, and clinicians may elect observation in uncertain diagnosis or suspected AOM without severe symptoms for 48–72 hours.

Patients must be followed carefully, and antibiotics should be given if symptoms persist or worsen (AAP, 2004). Patients who are immunosuppressed or appear to be toxic and those with underlying chronic OME, Down syndrome, or cochlear implants would not be candidates for observation alone (AAP).

Pain should be managed aggressively. Ibuprofen or acetaminophen, dosed around-the-clock, is recommended. Antibiotics usually will not relieve pain or reduce fever within the first 24 hours at all and only minimally after that (AAP, 2004). Severe pain may require more aggressive management that includes the use of narcotics. Topical analgesics also are appropriate unless the TM has ruptured.

**Pharmacologic Treatment**

The antibiotic of choice for AOM is amoxicillin for 10 days at standard dosing, according to the patient’s age and/or weight. Five to seven days of therapy may be appropriate. This should be administered twice a day for 10–14 days (Fang, 2004). Interestingly, about 80% of cases of AOM will resolve without antibiotics, and clinicians may elect observation in uncertain diagnosis or suspected AOM without severe symptoms for 48–72 hours. Patients must be followed carefully, and antibiotics should be given if symptoms persist or worsen (AAP, 2004). Patients who are immunosuppressed or appear to be toxic and those with underlying chronic OME, Down syndrome, or cochlear implants would not be candidates for observation alone (AAP).

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The management of OME is controversial because 65%–80% of cases resolve spontaneously within three months without antibiotic therapy (Albrant, 2000). Antibiotics and corticosteroids do not have proven long-term efficacy in OME; therefore, clinicians should use their best judgment. The use of antihistamines and decongestants for AOM and OME is common. However, no evidence exists that these agents are effective; therefore, they are not recommended (AAFP et al., 2004). If clinicians believe that combination therapy is appropriate, oral prednisone plus concurrent antibiotics is recommended (Albrant).

Nonpharmacologic Treatment

In patients with OME, complaints of middle ear pressure may be relieved by the use of vasoconstricting medication such as nasal sprays. Hydration and a cool mist humidifier may be beneficial (Eason, 20005). If conservative therapy is ineffective and effusion lasts more than three months, referral for paracentesis with the insertion of a grommet into the TM may relieve pain and improve hearing (Jereczek-Fossa et al., 2003). However, with radiation-induced OM, grommet insertion may not be as beneficial because the larger affected areas with radiation changes (Yang & Young, 2004).

Education of patients and caregivers is important. Parents need to be cautioned against “bottle-propping” (AAP, 2004). Elevation of the head during feeding also may be beneficial, although limited research is inconclusive (Albrant, 2000). An association appears to exist between attendance at daycare facilities and OM, with some studies showing as much as a twofold increase in OM (Albrant). Avoidance of environmental factors such as allergens and passive smoking also may be of benefit. The influenza vaccine may be appropriate for some patients because AOM is a common complication following influenza (Kaiser, 2000).

Follow-Up

A patient with AOM on antibiotics or observation should be reassessed within 48–72 hours to ensure that the treatment plan is adequate. Reassess again four to six weeks following treatment to evaluate for persistent OME. For persistent OME, observe for hearing loss, behavior changes, sleep disturbances, learning delays, speech delays, or other problems on a monthly basis. Referral to otolaryngologist or audiologist may be appropriate if effusion has persisted for three months, hearing loss is suspected, the TM is perforated, or the patient is an adult with more than one episode of AOM (Eason, 2005). During treatment and follow-up, observe for complications such as labyrinthitis, meningitis, mastoiditis, otitic hydrocephalus, cholesteatoma, brain abscess, facial nerve paralysis (Eason), and malignant external otitis (Grandis, Branstetter, & Yu, 2004).

J.T. was treated for AOM with amoxicillin 500 mg three times a day for seven days. Pain was treated with otic analgesic drops at bedtime and with 5 mg hydrocortone and 500 mg acetaminophen, two tablets at bedtime and every six hours as needed for pain. He was seen for follow-up in 10 days, and the infection was resolved. He continued to experience OME for about two months; when seen three months after the initial infection, symptoms and evidence of OME had resolved.

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References


