

Complications of Acute Otitis Media: A Single Center Experience

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ABSTRACT

Objective: Acute otitis media is the result of viral or bacterial infections in the middle ear. Despite the frequent use of antibiotics for different reasons, it can still be present with serious complications. Although acute otitis media is most common between ages 3 months - 3 years, it can be seen in adults and even it may result in serious complications too.

Patients and Methods: Our study was carried out by retrospectively screening patients who were admitted to Dumlupınar University Evliya Çelebi Training and Research Hospital between January 2013 and June 2015 for acute otitis media. During these years, hospital data of patients who have referred to our hospital have been reviewed for intracranial and intratemporal complications.

Results: A total of 2475 patients with acute otitis media were included. Intracranial and intratemporal complications were observed in 16 patients. The most frequent complications were mastoiditis (in 4 patients), subperiosteal abscess, faciaal nerve palsy and meningitis (each in three patients). Acute labyrinthitis developed in two patients and petrositis in one.

Conclusion: Despite the current preventive and therapeutic approaches, patients with acute otitis media can still present with complications.

Key words: Acute otitis media, complications, otitis media complications

INTRODUCTION

Otitis media (OM) is the inflammatory process in the middle ear space behind the tympanic membrane of the ear. For the diagnosis of acute otitis media (AOM), signs and symptoms of acute infection (such as fever, pain, redness and bulging) should be accompanied by a middle ear effusion [1]. Otitis media with effusion is a middle ear effusion without signs of inflammation. AOM is mostly seen in childhood. In a study conducted in five different European countries, the incidence of acute otitis media was reported as 256/1000 [2]. However, it should be noted that it may also be found in adult ages too.

Complications of AOM are divided into intracranial and intratemporal. Mastoiditis is the most common intratemporal complication, and meningitis is the most commonly seen

intracranial complication [3]. Medical and / or surgical treatments are used in the treatment. It is controversial when the surgical interventions will be performed, and which surgical operation will be performed. Miringotomy, myringotomy and ventilation tube administration or mastoidectomy procedures are methods used in the treatment of infection [4].

Acute otitis media complications in our study were reviewed retrospectively and discussed in the light of the literature, emphasizing that complications of acute otitis media can be seen in both children and adults and therefore more careful physical examination should be performed.

PATIENTS AND METHODS

Between January 2013 and June 2015; patients who admitted to Dumlupınar University Evliya Çelebi Training and Research Hospital with

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acute otitis media were included to the study. Patients whose information are not available, or incomplete are excluded from the study. Clinical findings of the patients and their complications were noted.

RESULTS

Totally 2475 patients with acute otitis media were referred to our hospital between January 2013 and June 2015. Intracranial and intratemporal complications were observed in 16 patients (Table 1), 11 of them were adults and 6 of them were children. The most common complaints of the patients who have complication were earache (75 %).

Patients with facial paralysis were treated with myringotomy and / or ventilation tube, followed by steroid and medical treatment at doses 1 mg / kg with tapering doses. Complete recovery has been achieved in all our facial paralysis patients. Mastoidectomy was performed in 1 of 3 meningitis cases. Three patients with subperiosteal abscess underwent surgical drainage and medical treatment. Subtotal petrosectomy was applied to the patient who developed petrositis after acute otitis media. In 2 patients with labyrinthitis, sensorineural hearing loss occurred. These patients underwent myringotomy and ventilation tube administration plus medical treatment. Temporal bone computed tomography confirmed "Labirentitis Ossifikans " (Figure 3).

Table 1. Number of patients with complications of acute otitis media detected in this study

Complication	Number of patients
Mastoiditis	4
Subperiosteal abscess	3
Facial nerve paralysis	3
Meningitis	3
Acute labyrinthitis	2
Acute petrositis	1
Total	16



Figure 1. Subperiosteal abscess



Figure 2. Subperiosteal abscess



Figure 3. Labirentitis Ossifikans

DISCUSSION

Complications of acute otitis media were more frequent in Pre – Antibiotic era. Today we have very powerful antibiotics, however resistant pathogens have emerged due to improper usage [5]. This might be a reason which increase the incidence of complications. Another reason is that mastoiditis symptoms may be masked during antibiotic use [6]. Eventually, mastoiditis and subperiosteal abscess can be encountered, and even intracranial complications can occur.

The most common complication of acute otitis is mastoiditis [3]. The most frequently accused microorganisms are *S. pneumonia*, *S. pyogenes*, *S. aureus* and coagulase negative staphylococci. Acute mastoiditis is the result of obliteration of aditus ad antrum. The inflammatory condition causes destruction in temporal bone formation. Patients have postauricular pain. In addition to typical otoscopic findings, edema is observed on the postauricular region. In a study conducted, the probability of a second complication in patients with acute mastoiditis is 38% [7]. We had 4 patients with acute otitis media-associated mastoiditis. Two of these patients were ameliorated by medical treatment and two were underwent mastoidectomy procedure.

Facial nerve paralysis can be seen as an acute otitis media complication with 0,5 to 0,005% [8]. Facial paralysis infection may be due to 1-direct effect, 2-osteitis in the course of edema, 3-bacterial toxin-induced demyelination in 4-vasa nervorum thrombosis [3]. It has been reported that the dehiscence of the facial canal can also occur [9]. Myringotomy, myringotomy and ventilation tube application or mastoidectomy can be applied in

the treatment. Facial paralysis was seen as a complication in 3 of our patients. In these patients with facial paralysis, 1 had dehiscence in the facial canal. Two patients had myringotomy, one patient had a ventilation tube. Therapeutic steroid added. In all cases, complete recovery were observed.

Acute labyrinthitis is mostly presented with hearing loss, dizziness, nausea and vomiting [10]. It can result from the direct spread of toxins or the microorganisms themselves and eventually result in serous or purulent labyrinthitis. Spreading of the infection through the dehiscence of the semicircular canals can cause dizziness, nausea, and vomiting. Spreading into the subarachnoid space may also cause meningitis. Sensorineural hearing loss is usually reversible. It is important to make early decision for cochlear implantation, especially considering the possibility of developing labyrinthitis ossificans with suppurative labyrinthitis [11]. Ossification formation of cochlea is best seen with computerized tomography. Acute labyrinthitis was seen as a complication in 2 of our patients and sensorineural hearing loss was the eventual consequence. Patients were followed by myringotomy and ventilation tube administration and medical treatment.

Petrositis is infection and inflammation of the apical portion of the petrous temporal bone. It is usually a complication of suppurative mastoiditis. [12]. Symptoms occur due to irritation of the petrosal apex neighboring structures as a result of infection. The diagnosis of acute petrositis is made by the course of the otitis media, symptoms of the patient and radiological examinations. In radiological imaging, magnetic resonance imaging together with computed tomography is used as a complement. Intravenous antibiotherapy and myringotomy were started in petrositis treatment. Surgery was performed in patients who do not respond to treatment and had temporal bone destruction. Acute petrositis was seen as a complication in 1 of our patients. In the patient who developed acute petrositis, despite medical treatment and myringotomy, no improvement was obtained and finally subtotal petrosectomy was applied.

Subperiosteal abscess; is one of the most common complications of acute mastoiditis. The end result is the spread of infection from the middle ear, epitympanic recess, aditus ad antrum and mastoid cells. Lahav et al. reported that 17 subperiosteal abscess patients who underwent drainage with myringotomy and postauricular needle aspiration in addition to appropriate antibiotic treatment achieved complete healing in 14 patients, whereas they applied mastoidectomy to patients who did not recover [13]. Subperiosteal abscess was seen as a complication in 3 of our patients. Patients with subperiosteal abscess underwent surgical drainage and myringotomy (Figure 1, Figure 2). Successful results were obtained in two patients while mastoidectomy was performed in one patient.

Meningitis is the most common intracranial complication of the acute otitis media [3]. Vigorous pain, fever, vomiting, photophobia, seizures can be seen. The findings of Kernig and Brudzinski can be followed. The diagnosis is made by examination of the cerebrospinal fluid taken with the lumbar puncture. Treatment

is myringotomy and medical treatment, but mastoidectomy can be performed in cases where treatment is inadequate. One of two our patients with meningitis developed mastoidectomy while the other patient decided to continue the treatment in an external center.

Cerebral abscess; It is the most mortal complication of middle ear infections [14]. Despite antibiotherapy, mortality rate is around 25%. Otogenous brain abscess is developed by direct venous thrombophlebitis. High fever, headache and neurological findings are the most important physical examination findings. The abscess is often located in the temporal lobe or cerebellum. The literature suggests that middle ear surgery is recommended after brain abscess treatment, and there are advocates that both attempts should be done at the same time.

Other intracranial complications include epidural abscess, subdural abscess, sigmoid sinus thrombophlebitis, otic hydrocephalus, pneumocephaly, and cerebral arterial infarction [15-20]. It should be considered to perform surgical intervention with appropriate medical treatment, otherwise mortality risk is higher.

In conclusion, despite the advanced preventive and therapeutic approaches, patients with acute otitis media can still present with complications. Contrary to what is known, it can be seen not only in children, but also in adults.

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