

Antibiotics for treatment of acute otitis media



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The role of Antibiotics for Treatment of Acute Otitis Media in Prevention of Subsequent Development of Acute Mastoiditis in Children

Introduction

Acute otitis media (AOM) is considered to be one of the most common infections in children. Most of the time it is self-limiting disease without need for antibiotic therapy; however, some children have individual potential for serious complications such as mastoiditis.

Acute mastoiditis is still the most common complication of acute Otitis media and is defined as an acute inflammation of the mastoid air cells which are contiguous with the middle ear cleft and arising as a result of spread of infection from acute otitis media beyond the middle ear.

The incidence of acute mastoiditis was significantly reduced following the antibiotic era and the overall incidence of mastoiditis as a complication of acute otitis media dropped to less than 1%. 1, 3. But some recent literature indicated an increase of the disease incidence especially in countries with less antibiotic prescription [2], while others reported that no increased incidence despite the national restriction guidelines of antibiotics prescription [4].

Most recently published guidelines reported that acute otitis media should be treated initially with supportive therapy with discretionary clinical follow-up and antibiotic treatment is reserved for cases in children younger than 6 months, unresolving cases, or otherwise complicated cases.

The aim of this study was to carry out a retrospective analysis of all children admitted with acute mastoiditis and to study the role of antibiotics prescribed for acute otitis media on development of acute mastoiditis.

Patients and Methods

The medical records of all children admitted, diagnosed and treated as acute mastoiditis in the Ear, Nose and Throat department in King Hussein Medical center, Amman- Jordan during the period 2002 to 2012 were studied retrospectively.

Patients were divided into 2 groups:

Group I: patients who received antibiotics for acute otitis media 2 weeks pre hospitalization.

Group II: patients who did not receive antibiotics prior to hospitalization.

The clinical criteria for the diagnosis of acute mastoiditis were based on the following:

- Clinical and Otomicroscopic evidence of acute otitis media on admission or recent episode of otitis media within 2 weeks before admission.
- Post-auricular inflammatory signs (swelling, erythema and tenderness).
- Anteroinferior displacement of the auricle.

Exclusion criteria were:

- Patients with incomplete data or in which the diagnosis was not conclusive.

- Patients suspected to have cholesteatoma.
- Immune compromised patients.
- Patients with ventilation tubes in situ.
- Patients who had undergone prior ear surgeries.

Data regarding the age, gender, and duration of pre hospitalization antibiotic therapy, the clinical and microbiological findings, treatment modality and the outcome of the disease were recorded.

Results

During the study period, a total number of 63 children were admitted with the diagnosis of acute mastoiditis (42 males and 21 females) aged from 7 months to 13 years with a mean age of 5.7 years.

Out of 63 patients, 56 (88.9%) patients had post auricular inflammation only whereas the remainder 7 (11.1%) cases had a subperiosteal abscess.

The preadmission history demonstrated that 52 (82.5%) patients had a history of antecedent acute otitis media within 2 weeks before admission.

Before the development of acute mastoiditis, we recorded that 41 (65.1%) children were taking oral antibiotics 2 weeks before admission prescribed for acute otitis media (Group I) with duration of therapy ranging between 1-13 days (mean duration 3.6 days). The most commonly prescribed antibiotic prior to hospitalization was amoxicillin-clavulanic acid (n= 30) followed by amoxicillin (n = 6), and first or second-generation cephalosporin (n = 5).

On other hand 11 patients did not use any type of antibiotics before admission which was confirmed by the Parents of patients (Group II).

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The duration of illness before admission of patient was ranging between 1-14 days (mean 3.5 ± 3.1 days).

Acute otitis media in the left side was reported to be more common than the right side (25 cases vs. 20 cases, respectively), Whereas 7 children were reported to have bilateral acute otitis media. None of our patients reported to have bilateral mastoiditis.

The Clinical features of children with acute mastoiditis on admission are shown in table I.

Computerized tomography of the Temporal bone was performed on admission in all patients and cloudiness of the mastoid was demonstrated in all the patients. In 7 cases there was destruction of cortex with subperiosteal abscess.

Data regarding microbiological culture findings was recorded in 48 patients, of whom 25 (52%) cultures were taken from middle ear aspirate during myringotomy; culture of pus from the external auditory canal was obtained in 11 patients (23%), from subperiosteal abscess in 7 patients (14.6%) and from the mastoid cavity during mastoidectomy in 5 patients (10.4%).

The most commonly isolated organisms were *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Proteus mirabilis* and *Haemophilus influenzae*.

On admission, all of the patients were treated with intravenous antibiotics and the most commonly used antibiotics were ceftriaxone, cefuroxime, Ceftazidime and Metronidazole.

In addition to Intravenous antibiotics, some patients were underwent tympanostomy tube insertion, abscess drainage and cortical mastoidectomy.

All patients in our study were recovered uneventfully with these treatment modalities and none of them developed recurrences of mastoiditis within a period of at least one year of clinical follow up.

Discussion

Although, in the literature the incidence of acute mastoiditis decreased in the last decades, there is some evidence that in recent years, this entity is rising, as Papournas and Kudo [6, 9] have reported. However, our series includes 63 cases of acute mastoiditis in 10 years period.

The demographic data collected in this study with regard to gender and age was consistent with other series [3, 7, 12]. Acute mastoiditis has been reported to be more predominant in boys as has been noted previously [11—14].

The use of broad spectrum antibiotics as initial treatment for acute otitis media, a rather common practice in our country, might play a role in selecting resistant microorganisms. In our study, in which 65.1% children were taking oral antibiotics for otitis media before admission provides evidence for the assumption that widespread use of antimicrobials in treatment of acute otitis media does not provide complete protection against acute mastoiditis. Furthermore, the symptoms of acute mastoiditis may be abated, in consequence of the treatment, requiring a high degree of awareness by contemporary clinicians to watch for manifestations.

Therefore, antimicrobials should be used judiciously in treatment of acute otitis media, avoiding the employment of broad-spectrum drugs as an initial regimen. Yet, complete abstention from use of antibiotics in treatment of suppurative otitis media is not advisable, as this seems to increase the risk of complications in general and of acute mastoiditis in particular [15, 16].

Recently, some authors observed that the number of children admitted to some hospitals with acute mastoiditis has risen [12-14]. However, Luntz et al [15] reported that the use of antibiotics is not a safe guard against acute mastoiditis and it may lead to a latent (masked) mastoiditis. Also, Kvaerner et al [4] - In their registry based study on 399 Norwegian children proved that the incidence of acute mastoiditis has not been increased in Norway despite the national restricted use of antibiotics in primary care.

Findings in children with acute mastoiditis are well described in clinical studies. In agreement with our findings the children are young, and present with retroauricular oedema, protrusion of the ear and abnormal tympanic membranes in addition to various degrees of general discomfort [1, 5 - 9]. The most frequent symptom in our study was abnormal tympanic membrane with retroauricular erythema.

During the last decade several reports show a decreasing rate of cortical mastoidectomy as the treatment of choice for acute mastoiditis. The rate of surgery varies greatly from 12 - 98% in different studies [1, 4 - 8]. This may be due to different criteria for the diagnosis and may also reflect the fact that an increasing portion of children are treated in pediatric wards. The increasing tendency for conservative treatment during the recent years may

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also reï→, ect an increasing availability of CT or MR scans to exclude complications.

Microbiological culture findings were recorded in 48 patients in this study and *Streptococcus pneumonia* was the most commonly isolated organism. Similar results have been reported by other authors [2, 6, 12, 15, 16]. Other identiï→ ð ed organisms were *Streptococcus pyogenes*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Proteus mirabilis* and *Haemophilus iniï→, uenzae*. Our data do not support that general use of antibiotics in acute otitis media will prevent the subsequent development of acute mastoiditis.

Neurological complications was reported in 5 - 20% in the literature [2, 3, 15], although recent publications show a lower rate of complications [6, 12]. In our material none of the patients developed neurological complications.

Conclusion

References

Table I Clinical features on admission of 63 children with Acute Mastoiditis

Clinical Feature	No. of patients (%)
Otalgia	48 (76. 2 %)
Fever ($\geq 38^{\circ}\text{C}$)	21 (33. 3 %)
Abnormal tympanic membrane	63 (100%)
Otorrhea	26 (41. 3 %)

Retro-auricular swelling	58 (92 %)
Retro-auricular erythema	63 (100 %)
Retro auricular abscess	7 (11. 1 %)
Displaced pinna	59 (93. 7 %)
More than one sign	60 (95. 2 %)
History of antecedent acute otitis media	52 (82. 5 %)
Absence of previous acute otitis media	11 (17. 5 %)
History of Pre-admission antibiotic treatment	41 (65. 1 %)