Pediatric Mastoiditis – Our Experience
Shrestha I, Pokharel M, Dhakal A, Amatya RCM
Department of ENT + HNS, Dhulikhel Hospital, Kathmandu University School of Medical Sciences
Author for correspondence: shresthainku@gmail.com

Introduction
Acute mastoiditis (AM) is likely to develop when AOM (Acute Otitis Media) fails to resolve.1,2 In the pre-antibiotic era, it was the most common and feared complication of AOM which caused life threatening complications beyond the temporal bone, including meningitis, epidural and subdural abscess, brain abscess and lateral sinus thrombophlebitis.3 The incidence of AM in pediatric age group has consistently increased4 even in developed countries.1,4,5 Similar negative tendency has been observed for suppurative intracranial complications.6 Abuse of or inadequacy of antibiotic treatment have been attributed to such phenomenon.6,7 The management protocols vary between different studies. Some centers have adopted a rather conservative method for its management and its associated complications.8,9 Even minor surgical interventions such as myringotomy, have been questioned, since mere parenteral antibiotics are considered adequate for the treatment of AM.10,11 Such conservative approach may be sufficient for some patients but not all.2

Materials and Methods
- Prospective, analytical study on 79 patients ≥18 years from Jan 2014 - June 2016
- Patient’s data recorded.
- Acute mastoiditis was diagnosed when one or more of the physical signs of mastoiditis (swelling, erythema, tenderness of retroauricular region and interaural displacement of the auricle) were diagnosed in the presence of concomitant or recent (< or = 4 weeks) AOM.12
- Patients excluded: Chronic otitis media with cholesteatoma, otitis externa and who refused admission or were not willing for follow up.
- Pur culture and sensitivity test sent.
- High resolution computed tomogram (CT) of temporal bone or X-ray Mastoid.

Treatment
- Conservative group: Injectable antibiotics: 3rd generation cephalosporin (ceftaxime sodium in a dose of 20-50mg/kg weight) i.v. with or without Metronidazole (7.5 mg/kg every 8 hours) - with myringotomy or incision and drainage.
- All children were given oral antibiotics for another 7-10 days after discharge.
- Antipyretics and analgesics were given on individual basis.
- Myringotomy when done was performed in postaural inferior quadrant is all children and drained. Ventilation tubes were not inserted in our patients.
- Statistical analysis were conducted using SPSS 16.0 software. Chi-Square test and 2 tailed T-test were used to analyse data collected. p value lower than 0.05 was considered to be statistically significant.

Results
- Mean agedSD was 9.32±3.33 with maximum age 18 and minimum age 1.
- History of recurrent AOM ≤4 weeks was present in 80(79.9%) children.
- All cases had unilateral involvement. Right ear was infected in 50.6% and 49.4% left ear.
- Among the 54 (66.4%) cultures sent from pus, 30 (38%) grew organisms.
- Hospital stay: 3-11 days with a meanSD of 5.58±1.99.
- All the children were cured and discharged after the treatment. Except for those complications present on admission, no additional intracranial or intra temporal complications related to further spread of the disease developed during our study period.
- Similarly on follow up no long term intracranial or intracranial complications, sequel or cases of `masked’ mastoiditis or any recurrence were noted.

Discussion
AM may be overlooked in developing countries like Nepal where set up and experienced doctors may be not available. It will lead to therapeutic protocols to be implicated incorrectly and thus its incidence is still a burden. Young children are least immunologically prepared to fight highly virulent organism, and the diagnosis of AOM is difficult to make due to the narrow extracranial canal which is often obstructed with wax. In addition the possibility of hematogenous spread of infection without underlying AOM has also been postulated.12 Streptococcus pneumoniae was most dominant organism grown in other studies. Failure to isolate bacteria is due to pre- antibiotic treatment or delay in presenting in hospital.13,14

Computed Tomography (CT) Imaging was performed only in 13 children with suspected intracranial complications, in recurrent acute mastoiditis, in non –typical presentations when diagnosis was in doubt or in the absence of favourable response to initial therapy. X ray mastoid bone was taken in 8 cases where patient could not afford a CT scan. Erosion of mastoid can be seen better with CT. Radiological investigations of small children are used with caution in other countries 15 due to the need of general anesthesia and the risks involved with irradiation. In developing countries like ours it is usually only afforded by the wealthy. Therefore unless suspicion of serious complication clinically, it is rather avoided. The treatment of SA has been long debated, we follow the motto “Ubipus ibi evacua” (where you find pus, remove it). The group treated with mastoidectomy had a longer hospital stay like in the study performed in 115 Swedish children.16 Mastoidectomy was the mainstay of treatment for acute mastoiditis in the pre-antibiotic era. The availability of antibiotics radically changed the management of the disease, and intravenous antibiotics combined with drainage of pus have been shown to be effective in the management of uncomplicated cases of acute mastoiditis in a number of series. (Table)

MASTOIDECTOMY RATES IN RETROSPECTIVE SERIES OF PEDIATRIC AM

<table>
<thead>
<tr>
<th>Procedure</th>
<th>With</th>
<th>Without</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatoscintigraphy (n)</td>
<td>85</td>
<td>12</td>
<td>0.05</td>
</tr>
<tr>
<td>Gram stain (n)</td>
<td>87</td>
<td>5</td>
<td>0.05</td>
</tr>
<tr>
<td>Culture (n)</td>
<td>90</td>
<td>12</td>
<td>0.05</td>
</tr>
<tr>
<td>Viral culture (n)</td>
<td>90</td>
<td>12</td>
<td>0.05</td>
</tr>
<tr>
<td>Computed tomography (n)</td>
<td>90</td>
<td>12</td>
<td>0.05</td>
</tr>
<tr>
<td>Facial palsy (n)</td>
<td>90</td>
<td>12</td>
<td>0.05</td>
</tr>
<tr>
<td>Hearing loss (n)</td>
<td>90</td>
<td>12</td>
<td>0.05</td>
</tr>
<tr>
<td>Other complications (n)</td>
<td>90</td>
<td>12</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Limitations of study
- Small number and short duration.
- Under diagnosis.
- Not all patients received a CT scan.
- Non admitted patients.
- Over the counter antibiotic therapy.
- Long term follow up is not possible due to geographic and financial conditions.

Conclusion
Drainage of the abscess (retroauricular needle aspiration or incision) represents a simple and risk free option. It can be safely used as an initial conservative approach in association with sufficient antibiotic coverage with simple mastoidectomy reserved for non responding AM. With early recognition and effective treatment, the prognosis of AM is good.