Original article:

Pseudomonas aeruginosa in chronic suppurative otitis media- sensitivity spectrum against various antibiotics in Karaikal

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Abstract:

Introduction: Our objectives was to identify the incidence of pseudomonas aeruginosa involved in chronic suppurative otitis media(CSOM) and sensitivity against commonly prescribed antibiotics.

Methodology: A total of 97 patients ,between 11 to50 years of age group, with unilateral CSOM were enrolled in the study at Dept of ENT, Vinayaka Missions Medical college, Karaikal from January 2012 to December 2013.sterile cotton swabs were used to collect pus from discharging ears, and plated on blood agar and Mac Conkey agar for 24 to 48 hours. Antibiotic susceptibility was tested by disc diffusion technique, using Mueller-Hinton agar.

Results:Overall microbiology of 97 samples from 97 patients was studied. Pseudomonas aeruginosa (42.27%) and staphylococcus aureus(34.02%) were the most common bacterial agents found in CSOM. Antibiogram was done for only pseudomonas aeruginosa as it was the commonest pathogen found in CSOM. Sensitivity pattern of pseudomonas aeruginosa showed that amikacin was active against 95.12% of isolates followed by other drugs ceftazidime, amoxiclav, azithromycin, gentamycin, ciprofloxacin and erythromycin in descending order.

Conclusion: Pseudomonas aeruginosa was the most common bacteria isolated from chronic discharging ears. Amikacin was found to be the most sensitive against pseudomonas aeruginosa.

Key words: Pseudomonas aeruginosa, chronic suppurative otitis media(CSOM)

Introduction:

Chronic suppurative otitis media(CSOM) is a prevailing and notorious infection in deveoloping countries causing serious local damage and threatening complications. It is characterised by painless discharge from ears dating from months to years and is the single major cause of deafness in India. It is common amongst children of low socio economic strata1 . The introduction of antibiotics has reduced the incidence of intra cranial complications in otitis media. Early and effective treatment based on the knowledge of causing micro organisms and their sensitivity results in good clinical recovery and prevents damage and complications.

Pseudomonas aeruginosa was the most common pathogen among the cases of CSOM reported by several workers in India and abroad with an incidence ranging from 21% to52.94%2,3,4,5,6,7,8,9

Hence, in this study an effort has been made to:

1.Identify the most common bacterial etiology of CSOM.
2. Determine the antibiogram of the pseudomonas aeruginosa

**Material and methods:**
A total of 97 patients between 11 to 50 years of age group with the clinical diagnosis of unilateral CSOM were enrolled in the study group from the department of ENT, Vinayaka Missions Medical College, Karaikal, Puducherry (UT) from Jan 2012 to Dec 2013. The ear discharge was collected under aseptic precautions with the aid of an aural speculum, prior to the instillation of any topical medication. As the objectives of the study program were discussed with the department of Microbiology and their cooperation was requested prior, the swabs were sent for culture and sensitivity. As the pseudomonas aeruginosa is being responsible for most of the CSOM cases, reported by several workers, the antibiogram of Psedomonas aeruginosa was tested against specific commonly used antibiotics was requested specially. The swabs were inoculated on the Mac Conkey agar and Blood agar, these plates were incubated aerobically at 37°C for 24 to 48 hours. All plates which showed growth were processed as per standard microbiological procedures. Antibiotic sensitivity testing was done by Kirby Bauer disk diffusion method using Mueller-Hinton agar. The antibiogram of Pseudomonas aeruginosa was tested against commonly used antibiotics.

1) Amikacin
2) Ceftazidine
3) Amoxiclav
4) Azithromycin
5) Gentamycin
6) Ciprofloxacin
7) Erythromycin.

**Results:**
Table 1: Bacteria isolated from ear swabs (n=97)

<table>
<thead>
<tr>
<th>Isolate</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>41</td>
<td>42.27%</td>
</tr>
<tr>
<td>Staphylococcus Aureus</td>
<td>33</td>
<td>34.02%</td>
</tr>
<tr>
<td>Eschercia coli</td>
<td>13</td>
<td>13.40%</td>
</tr>
<tr>
<td>Proteus species</td>
<td>5</td>
<td>5.155%</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>5</td>
<td>5.155%</td>
</tr>
</tbody>
</table>

This table shows the incidence of various bacteria isolated from 97 specimens. Pseudomonas aeruginosa was the most predominant species in 41 cases, followed by staphylococcus aureus in 33 cases, Eschercia coli was present in 13 cases and proteus, klebsiella species were seen in 5 cases each.
Table 2: sensitivity pattern of Pseudomonas aeruginosa(n=41)

<table>
<thead>
<tr>
<th>Name of antibiotic</th>
<th>NO. of susceptible strains</th>
<th>Sensitivity percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMIKACIN</td>
<td>39</td>
<td>95.12%</td>
</tr>
<tr>
<td>CEFTAZIDIME</td>
<td>35</td>
<td>85.36%</td>
</tr>
<tr>
<td>AMOXICLAV</td>
<td>25</td>
<td>60.97%</td>
</tr>
<tr>
<td>AZITHROMYCIN</td>
<td>22</td>
<td>53.65%</td>
</tr>
<tr>
<td>GENTAMYCIN</td>
<td>22</td>
<td>53.65%</td>
</tr>
<tr>
<td>CIPROFLOXACIN</td>
<td>15</td>
<td>36.58%</td>
</tr>
<tr>
<td>ERYTHROMYCIN</td>
<td>13</td>
<td>31.70%</td>
</tr>
</tbody>
</table>

Out of a total 41 strains of Pseudomonas aeruginosa maximum sensitivity was noted for amikacin (39/41) and least sensitivity for erythromycin(13/41).

**Discussion:**

According to senturia(1980) the acute phase of otitis media is considered to be the initial three weeks of inflammation, chronic phase three months following the onset of inflammation and subacute phase is said to be between 3 weeks and 3 months.10

Many studies have investigated the bacterial flora in CSOM. The commonest organisms isolated are Pseudomonas aeruginosa, Staphylococcus aureus and proteus. Less common organisms are E.coli and Klebsiella species.10

In this study Pseudomonas aeruginosa was the most predominant organism being isolated in 41(42.27%) of the cases. It was followed in order of predominance by Staphylococcus aureus in 33(34.02%) cases. This was followed by E.coli in 13(13.4%) cases. Proteus and klebsiella in 5(5.15%) cases each. These findings were similar to those of similar studies.11 Pseudomonas aeruginosa is a Gram-negative aerobic bacillus. It is an opportunistic pathogen, meaning that it exploits some break in host defences to initiate an infection.12 Unfortunately it demonstrates resistance to multiple antibiotics, thereby jeopardizing the selection of appropriate antibiotic.13 In this study as the Pseudomonas aeruginosa was the most predominant organism in CSOM, the maximum sensitivity was noted for Amikacin (39/41) followed by Ceftazidime(35/41) and Amoxiclav(25/41). Least sensitivity was noted for Erythromycin(13/41). The observations of this study can help to improve the rational use of antibiotics in patients with CSOM, and also to curtail the economic burden to the patients in the region of Karaikal.

**Conclusion:**

Pseudomonas aeruginosa was the most common bacteria isolated from chronic discharging ears. Amikacin was found to be the most sensitive against pseudomonas aeruginosa.

Development of resistance to commonly used antibiotics for treating Pseudomonas aeruginosa infections in CSOM, alert us against indiscriminate usage of antibiotics to prevent development of resistance.

**References:**

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