Original Article

PREVALENCE OF AEROBIC BACTERIAL STUDY OF CSOM IN A TERTIARY CARE CENTRE IN KANPUR.

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ABSTRACT

Background: Chronic suppurative otitis media (CSOM) is a commonly encountered infection of the middle ear. It can cause extra cranial and intracranial complications and involves considerable morbidity. Objective: The objective of this study was to isolate the aerobic organisms associated with CSOM and to detect the prevalence of the aerobic isolates. Method: The study was conducted on 100 cases of recurrent discharging ear at the out patient door of Dept of E.N.T and Dept. of Microbiology,Rama Medical College Hospital and Research Centre, Mandhana Kanpur. Results: Out of 100 cases, 64 were found to be aerobic bacterial positive having the prevalence rate of 64%. Females are affected more (55.7%) than males. The total number of aerobes isolated is 64 (64%). Among the aerobes Pseudomonas aeruginosa is most common 27 (42.18%).

Key words: Chronic suppurative otitis media, bacterial infection, aerobic organisms.
INTRODUCTION

The Otitis media is a major health problem and occurs with a high incidence and prevalence in both developed as well as developing countries. The inflammation often begins when infections that cause sore throat, cold, or other respiratory or breathing problems spread to middle ear. It can be either suppurative or nonsuppurative.¹ Acute otitis media (AOM) is a common childhood illness. An AOM episode, if not diagnosed promptly or is inadequately treated can lead to chronic suppurative otitis media (CSOM).[1,2]

Chronic otitis media (COM) is defined as a perforation of the tympanic membrane with persistent drainage of pus from the middle ear lasting at least two weeks.[2] Chronic Suppurative Otitis Media (CSOM) is one of the most common childhood diseases and according to WHO estimate affects 65 to 330 million people worldwide mainly in developing countries.[3] Multi drug resistance bacteria are responsible for chronicity. Indiscriminate use of antibiotics leads to resistance and poor follow up have resulted in persistent low grade infection, hence its complications make it the bugbear of the otologists, paediatricians and general practitioners.[4]

Considering the above facts, this study was undertaken to isolate aerobes and anaerobes from samples in chronic suppurative otitis media patients and study their sensitivity pattern of aerobic bacteria to help the clinician to treat the CSOM patients and empirically at a tertiary care centre in Kanpur.

MATERIAL AND METHODS

This is a Cross sectional study which was carried out for the period of 1 year from July 2016 to June 2017 conducted out in the Department of Microbiology, Rama Medical College Hospital and Research centre, where patients attending ENT, OPD and IPD at Rama Medical College Hospital and Research Centre formed the source of the sample for the study.

100 samples from clinically detected patients to have CSOM were taken during the study period.
Detailed clinical history regarding age, gender, duration of discharge from the ear and antibiotic therapy was taken. Patients of any age, both gender, unilateral or bilateral draining ears due to CSOM of more than two weeks (WHO-definition) was included in the study. Demographic data was taken and together with the patient’s medical history and physical examination findings was be entered in the patient’s proforma.

**Sample Processing:**

Two sterile swabs which were procured from Hi-Media were used to collect discharge fro, patients diagnosed with CSOM. All care was taken to avoid surface contamination. Swabs were the transported to microbiology laboratory.

First swab was used for bacteriology.

Second swab was for anaerobic study.

Direct gram staining was done from the 1st swab.

Then 1st swab was inoculated on Blood Agar, Chocolate Agar & MacConkey Agar. These plates were kept at 37°C for 24-48 hours. Bacterial isolates were identified by their colony characteristics, morphology by gram’s staining reaction and standard biochemical reactions. Antimicrobial susceptibility testing was performed for all the isolates with positive cultures according to Kirby-Bauer’s disk diffusion method following Clinical Laboratory Standard (CLSI) Guidelines 2016.[5]

**For aerobic culture**- On day 1 we performed gram staining and inoculated on BA, MA, CA and was incubated at 37°C. On day 2 if growth then we observed colony characters on BA, MA, CA and smear for gram stain was done. If GNB then hanging drop for motility and if GPC then slide coagulase. Test for enzymes, biochemistry tests was done. The biochemical tests was done and sugar fermentation was also done where glucose, lactose, sucrose, maltose, mannose, arabinose, xylose was done. The antibiotic susceptibility testing was done by using Kirby Bauer disc diffusion method on Mueller Hinton agar plate. (CLSI guideline 2016). On day 3 we observed the biochemical tests, sugar fermentation and sensitivity pattern were read. The sensitivity pattern was reported to the ENT surgeon. If there was no growth on day 2 then we further
incubated for 24 hours finally report it as no growth after 48 hours of aerobic incubation if still there was no growth then we discarded.

Results

Sample from hundred clinically diagnosed cases of Chronic suppurative otitis media attending ENT OPD and IPD Hospital and were studied in the Department of Microbiology, Ram Medical College Hospital and Research centre.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Total no. of Cases studies</th>
<th>Total no. of positives</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>42</td>
<td>31</td>
<td>44.2%</td>
</tr>
<tr>
<td>Female</td>
<td>58</td>
<td>39</td>
<td>55.7%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>76</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table-1 : Sex wise distribution

Out of hundred cases 42 were males and 58 were females, out of 42 males studied 44.7% were positive for culture and out of 58 females 55.7% were positive for the culture. Above table shows incidence of CSOM was higher in females compare to males.
FIG 1: SEX WISE DISTRIBUTION

<table>
<thead>
<tr>
<th>ORGANISMS</th>
<th>NO. OF ISOLATES (n=64)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>27</td>
<td>42.1825%</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>10</td>
<td>15.625%</td>
</tr>
<tr>
<td>Acinetobacter spp</td>
<td>7</td>
<td>10.9375%</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>5</td>
<td>7.8125%</td>
</tr>
<tr>
<td>Proteus vulgaris</td>
<td>1</td>
<td>1.5625%</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>4</td>
<td>6.25%</td>
</tr>
<tr>
<td>Klebsiella oxytoca</td>
<td>2</td>
<td>3.125%</td>
</tr>
<tr>
<td>Eschericia coli</td>
<td>4</td>
<td>6.25%</td>
</tr>
<tr>
<td>Citrobacter freundii</td>
<td>1</td>
<td>1.5625%</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>1</td>
<td>1.5625%</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>2</td>
<td>3.125%</td>
</tr>
</tbody>
</table>

Table-1: Shows the total number of aerobic bacteria isolated in the present study.

Discussion

CSOM is a major public-health problem, and India is one of the countries with high-prevalence where urgent attention is needed[6]. It's a persistent disease with great risk of irreversible complications. CSOM is an important cause of preventable hearing loss particularly in the developing world[7] and a reason of serious concern, particularly in children, because it may have long-term effects on early communication, language development, auditory processing, educational process, and physiological and cognitive development.[6] Early, microbiological diagnosis ensures prompt and effective treatment to avoid such complications. High prevalence of culture positive cases of CSOM (64%) was seen in the present study. Poor hygiene and unorthodox approach to treatment like use of unconventional ear drops and concoctions such as oil and honey into the middle-ear may initiate the proliferation of opportunistic pathogens leading to blockage of eustachian tube (ET).[8]
Cases of CSOM were more common in females (58) than in males (42). This observation was parallel with the findings of few authors[9,10] and in contrast with other researchers.[11,12] As this study involved, a random selection of cases the predominance of female patients over male may be only an incidental finding. Moreover, no knowledge of anatomical differences in the ear structures of male and female has been reported.

Our study revealed that both gram-positive and gram-negative organisms are responsible for infection of middle-ear. The most common aerobic organism isolated in the present study is Pseudomonas aeruginosa 27 (42.18%) followed by Staphylococcus aureus 10 (15.65%).

**CONCLUSION**

CSOM is the most common chronic infectious disease worldwide. The factors underlying the pathogenesis of CSOM are still poorly understood. There is an urgent need to focus research studies in the area of CSOM, which will open up avenues to design novel therapeutic studies against CSOM and hence prevent gearing loss. Medical and surgical options are limited, with side effects and risks, and sometimes are not successful in eliminating disease. Topical antibiotics, which are the first-line therapy of choice, are limited only to those that are not potentially ototoxic. Additionally, surgery carries the risks of worsening hearing, as well as the potential for damage to the facial nerve and resulting facial nerve paresis.

This study concludes that the maximum number of patients belong to the 30th decade of life. The most common aerobic organism responsible for CSOM is Pseudomonas aeruginosa (42.18%) followed by Staphylococcus aureus (15.62%). Among 13 Staphylococcus species 2 were MRSA and among GNB 5 detected as ESBL producer. The most effective antibiotic is Amikacin for both gram negative and gram positive organism.
REFERENCES


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