Bacteriological Prevalence and Growth Pattern in Patients of Chronic Suppurative Otitis Media in Mirpur AJK

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Abstract

Objective: To evaluate bacteriological and age wise prevalence of Chronic Suppurative Otitis Media in the study area.

Materials and Methods: This cross-sectional study was carried out at Divisional Teaching Headquarter Hospital of Mirpur AJK from April 2012 to December 2014. Seventy patient of Chronic Suppurative Otitis Media were evaluated on the basis of Patient`s demographic data and ear discharge in the outpatient department of E.N.T. Informed consent was taken from all the patients. Sterile swabs were obtained from discharging ear/s and cultured both aerobically and anaerobically.

Results: In total of seventy patients, 70% of CSOM prevalence is in age <30 years and Staphylococcus aureus (67%) was the dominant agent isolated from the CSOM in the study area, followed by the Pseudomonas aeruginosa (17%).

Conclusion: Prompt diagnosis based upon bacteriological factors and age wise prevalence of CSOM can help early diagnosis and prevent avoidable deafness.

Key words: Otitis Media, Suppurative, Staphylococcus aureus, Prevalence.

Introduction

Chronic Suppurative Otitis Media (CSOM) is defined as the inflammation of middle ear cleft causing perforation of tympanic membrane leading to recurrent or persistent ear discharge.¹ The infection reaches the middle ear usually through the Eustachian tube and perforated tympanic membrane.²³ CSOM and its complications are among the most common presentation encountered by ENT specialists and general practitioners, most cases resulting from either untreated or under treated. Acute Suppurative Otitis media.²

In 1990’s, CSOM and its complication particularly brain abscess caused an alarming situation leading to 28000 deaths.⁴ It has high incidence and chronicity due to its peculiar anatomy of middle ear and repeated upper respiratory infections through Eustachian tube. Other factors which lead to chronicity include bacterial resistance; prolong treatment, lack of compliance and also ototoxicity with both topical and systemic antibiotics.⁵

Chronic Suppurative Otitis Media (CSOM) is prevalent worldwide. The prevalence of chronic Otitis media cases in the general population of South East Asia is approximately 5.2% according to the World Health Organization report published in 2004.⁶ The prevalence is between 2-17% in India, Bangladesh and various countries in Africa. CSOM is the most common cause of preventable hearing loss in Pakistan. It is a major problem in other developing countries as well.⁷⁸

Most common microorganisms found in CSOM are Pseudomonas aeruginosa, Staphylococcus aureus, Proteus mirabilis, Klebsiella pneumoniae, Escherichia coli, Aspergillus spp and Candida spp, varying in various geographical areas⁷ while Anaerobic bacteria include bacteroides spp.⁹ Traditionally CSOM was classified as "Safe"(tubo-tympanic) and "Unsafe" (Attico-antral) disease. As bone erosion was an inherent pathological feature in Unsafe disease so it was also called as erosive middle ear disease. In developing countries, CSOM causing deafness in more than one third of the population has profound impact on society, and is believed to be responsible for intellectual and educational problems in children by causing deafness in more than two thirds of them²⁰-¹⁵ Present study was thus planned to evaluate bacteriological and age wise prevalence of Chronic Suppurative Otitis Media at Mirpur AJK.

Material and Methods

CSOM patients attending the OPD Clinic of Ear, Nose and Throat (ENT) specialist at District Headquarter teaching
hospital, who had no antibiotic treatment for the previous three days, were referred for bacteriological investigation. Demographic details of the patients were also collected. A total of 70 patients were included in the study. History was taken regarding age, duration of ear discharge and any antibiotic treatment received. Inclusion and exclusion criteria were set as follows: Patient of any age, patient of either sex, ear discharge of more than 3 months duration were included. Discharge of less than 3 months duration, discharge with intact tympanic membrane (otitis externa) and patient receiving antibiotics at presentation were excluded.

Clinical examination was done to rule out acute otitis media and otitis externa. Sterile cotton swabs were used to collect pus from discharging ears. The ear/ears discharge was collected on two swabs with a sterile swab stick, one used for microscopy and the second for culture from each patient and the samples were aseptically cultured on MacConkey agar (Oxoid), Blood and Chocolate agar plates within three hours.

The blood and MacConkey agar plates were incubated aerobically and Chocolate agar plates were incubated anaerobically at 37°C for 24-48 hours. The colonies were identified by colonial morphology and Gram stain. The Gram negative organisms were confirmed by setting biochemical test following the World Health Organization Manual for Laboratory Investigations.16 SPSS 19 was used to analyze the data. All numerical variables were measured as number and percentages.

Results

Age wise distribution of CSOM Cases: Table 1 shows age wise distribution of CSOM in the study population. As shown in the table the major disease burden is in early 30 years of life in the study area.

Culture and Growth Pattern: Data analysis revealed the cultural growth was \( n=58 \) (83%) positive while \( n=10 \) (14%) shows no growth and \( n=2 \) (3%) showed mixed growth (figure 1). Total 80% of culture showed positive for cultural growth while 14% showed sterile growth (culture negative).

Bacterial isolates: Data analysis of CSOM cases during the current study revealed that Staphylococcus aureus \( n=47 \) (67%) was the dominant organism for CSOM in the study area, followed by the Pseudomonas aeruginosa \( n=12 \) (17%). While Streptococcus, Proteus Mirabilis and E coli accounted for \( n=4 \) (5.7%), \( n=2 \) (3%) and \( n=3 \) (5%) respectively and \( n=2 \) (3%) showed mixed growth.

Ear wise distribution of CSOM Cases: The study also revealed that 44% of the cases had involvement of right ear, 41% left ear and 15% of the cases had involvement of both ears (Figure 2).

<table>
<thead>
<tr>
<th>Age (in yrs)</th>
<th>Number (%)</th>
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<tbody>
<tr>
<td>&lt;10</td>
<td>13 (19)</td>
</tr>
<tr>
<td>10-20</td>
<td>21 (30)</td>
</tr>
<tr>
<td>20-30</td>
<td>19 (27)</td>
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<tr>
<td>30-40</td>
<td>10 (14)</td>
</tr>
<tr>
<td>40-50</td>
<td>4 (06)</td>
</tr>
<tr>
<td>&gt;50</td>
<td>3 (04)</td>
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Discussion

Chronic Suppurative Otitis Media is a major cause of acquired hearing impairment in communities, especially in developing countries.7,8 The disease manifests as continuous discharge from Middle ear.1 Unfortunately most of the treatment options are either disappointing or very costly and tricky; leaving patient’s care seekers with no options other than to drop trust on Health department and thus promote quackery. CSOM is major public health issue with substantial impact on society like deafness, dropout in schools and poor performance at school and colleges. Prompt diagnosis can lead to treatment in right directions, avoid complications and ultimately prevent avoidable deafness. This study mainly focuses on prompt diagnosis through exploring the factors like, age wise distribution, growth pattern and major bacteriological factors responsible
for CSOM in the study area. Current study revealed the major disease burden is before the age of 30 years, 49% of the cases were in 0-20 year’s age category and majority of the CSOM infection caused by Staphylococcus Aureus, followed by Pseudomonas Aeroginosa. Unilateral ear involvement in majority (85%) of cases (44% right ear and 41% left ear) may be just incidental. As we discussed earlier several studies and WHO reports shows CSOM causes avoidable deafness in one third of communities in developing countries and on top of that two third of the CSOM afflicted communities suffer intellectually in schools and colleges level. Frequent upper respiratory tract infections and poor socio economic conditions, poor hygiene, under nutrition and misuse of antibiotics may lead to the development of CSOM, and the prevalence of complications is comparatively higher leading to high morbidity. The other important factors associated with its occurrence are overcrowding, failure towards infection control, and a lack of trained staff in controlling infections in hospital. Knowledge of the pattern of local microorganisms causing CSOM and their antibiotic sensitivity is therefore essential for an accurate and cost effective treatment. Moreover, control of risk factors such as poor hygiene and overcrowding and ear cleaning practices are also of prime importance for disease control.

**Conclusion**

Identification and complete knowledge of causative agents of CSOM will help the physicians to cure the disease and lessen the disease burden.

**Conflict of interest**

This study has no conflict of interest declared by any author.

**References**