



BACTERIOLOGICAL PROFILE OF CHRONIC SUPPURATIVE OTITIS MEDIA AT TERTIARY CARE HEALTH CENTRE

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ABSTRACT **Background:** Chronic suppurative otitis media (CSOM) is a disease affecting the middle ear and mastoid cavity, leading to considerable morbidity by causing hearing loss; and even life threatening complications in squamosal type of CSOM, if left untreated over long periods of time. Hence it is imperative to treat the persistent ear discharge in CSOM according to the antibiotics susceptibility of the organisms isolated. **Aim:** This study was carried out to examine the current local bacteriological profile of CSOM and to study the antibiotic susceptibility pattern of the isolates. **Methods:** We carried out a retrospective analysis of ear swab cultures from 31 unilateral CSOM cases seen at the Ear-Nose-Throat clinics of a referral health institution during a 8 month period ending 2020. Sensitivities to seven locally available antibiotics were analyzed. **Results:** We analyzed 17 ear swab culture results from 31 patients with age ranging from 5 year to 60 years and a mean 24.87 years. *Pseudomonas aeruginosa* was the most common isolated bacteria (34.4% [11/31]) followed by *Acinetobacter Species* (6.3% [2/31]), and *Proteus Mirabilis* (6.3% [2/31]). The most and least sensitive bacteria were *Pseudomonas aeruginosa* and *Acinetobacter Species*, respectively. The most effective antibiotics were gentamicin and Ciprofloxacin. **Conclusion:** *Pseudomonas* is the most common bacteria involved in CSOM in this part of the country. Ciprofloxacin as ear drops is recommended as first-line drug in the management of active CSOM as it is cheap, less ototoxic, and locally available.

KEYWORDS : Chronic suppurative otitis media, Bacteriological Profile

INTRODUCTION

Chronic suppurative otitis media (CSOM) is the most common infection of the ear characterized by persistent or recurrent purulent drainage from the middle ear through a persistent non-intact tympanic membrane. Although it is a global disease, its incidence has remained relatively higher in resource-poorer countries^[1,2,3,4]. Often, the primary care physicians are usually the first to see these patients and mostly rely on empirical antibiotic therapy and only refer to the otolaryngologist when their treatments fail. Due to its recurrent nature and the development of resistant pathogenic organisms, control of infection poses a greatest therapeutic challenge. The challenges of resistance have even been compounded by the activities of quacks in this part of the country where they engage in uninformed administration of antibiotics to these patients. These days, it is rare for an otolaryngologist to encounter bacterial flora of a chronic discharging ear that has not already been modified by previous antibiotic therapy with some of them returning sterile cultures.^[5] Knowledge of the local microbiological flora in CSOM is essential for initiating empirical therapy pending culture results, making it mandatory for periodic surveillance of microbiological profile and sensitivity pattern in CSOM.

MATERIALS AND METHODS

We conducted a retrospective analysis of consecutive new cases of clinically diagnosed CSOM seen in the Ear-Nose-Throat Outpatient Department of a Tertiary Institution during a 8 month period ending 2020. Those included had active ear discharge in one ear for at least 3 months and from who ear swab specimens were sent for microscopy and culture at our Microbiology Department. Patients with recent history of ear trauma preceding the otorrhea, HIV and diabetic patients, those found to have atticointral disease were excluded from the study. Details including the history and relevant findings were retrieved from the patients' records which included otoscopic examination findings.

Collection of specimen

Swab samples were collected from the discharging ears by inserting a sterile specimen stick deep in the canal. The collected samples were enclosed in airtight plastic tubing and then transported to the microbiology laboratory. The samples were taken before cleaning/suctioning the ear canals of the excess purulent exudates. The swabs were inoculated on MacConkey agar and Brain heart Infusion Agar plates and incubated for 48 h. The agar plates were examined after 24 and 48 h. The plates showing no growth at 48 h were recorded as negative cultures. Bacteria showing growth were identified by standard techniques based on morphological, cultural, and

biochemical characteristics. Culture for anaerobic organisms was not performed in this present study. Antimicrobial sensitivities were carried out using standard disc diffusion technique of Bauer et al.^[6]

Statistical analysis

Collected data were tabulated & analyzed in Microsoft excel worksheet. Further calculation was done by percentage and ratio.

RESULTS

Among the 31 CSOM cases studied, 16 samples were ear culture positive, out of which 15 having single isolates whereas 1 having 2 isolates, this is how total 17 isolates were available for analysis. Among 31 CSOM cases, their ages ranged from 5 years to 60 years with a mean of 24.87 years. 22.5% were children aged 5 years to 15 years. The males accounted for 71% (22/31) of the patients with a male to female ratio of 2.4:1.

Table No.1: Sex Wise Distribution:

Sex	Total(percentage)	Positive(Percentage)
Male	22(71%)	12(75%)
Female	09(29%)	04(25%)
Total	31(100%)	16(100%)

Bacterial isolates

The culture samples of 16 ears (51.6% [16/31]) were positive. *Pseudomonas aeruginosa* was the most common isolated bacteria (34.4% [11/31]), followed by *Acinetobacter Species* (6.3% [2/31]), and *Proteus Mirabilis* (6.3% [2/31]).

Table 2: Percentage Of Isolates:

Isolates	Culture positive out of 31 samples	Percentage
<i>Pseudomonas aeruginosa</i>	11	34.4%
<i>Acinetobacter Species</i>	2	6.3%
<i>Proteus Mirabilis</i>	2	6.3%
<i>Klebsiella species</i>	1	3.1%
<i>E.coli</i>	1	3.1%
No growth	15	46.8%

Antibiotic susceptibility test

The most and least sensitive bacteria were *Pseudomonas aeruginosa* and *Acinetobacter Species*, respectively. Overall, the most effective antibiotics were gentamicin (88.2%) followed by ciprofloxacin (76.4%).

DISCUSSION

Chronic Suppurative otitis media are a common disease with

approximately 5% global incidence.[1] It is characterised by chronic inflammation of the middle ear cleft with recurrent ear discharge through a persistent perforated ear drum. The chronic inflammation results from the presence of bacteria in the middle ear and mastoid cavity. Bacteria are believed to gain access to the middle ear cleft either from the external auditory canal through the perforation or from the nasopharynx via the eustachian tube or both. But regardless of the entry mechanism, biofilm formation has been suggested to explain the recalcitrant nature of CSOM.[7] The susceptibility of organisms causing CSOM to antibiotics changes considerably from time to time and this variation is even worsened by misuse of antibiotics, which tend to create multidrug resistance among the organisms, thereby making the management of CSOM more difficult.[7,8,9] Often, it is common in the otologic practice to see actively discharging ears yielding sterile cultures in view of previous antibiotic therapy which had modified the bacterial making treatment problematic.[10,11] For rational antibiotic use and successful of treatment of CSOM, an appropriate knowledge of antibacterial susceptibility of causative microorganisms is imperative.

The results of this study showed that overall *P.aeruginosa* was the most common aerobic isolate in CSOM followed by *Acinetobacter* Species which is in agreement with the reports of some other investigators in different parts of the worlds.[8,11,12] As a policy, bacteriological study and antibiotic sensitivity should be obtained for every CSOM patient so that specific antibiotic therapy will be tailored to the individual cases. In our study, 48.3% of the cultures did not yield any microbial growth, such negative cultures may have been as a result of the modification of the bacterial flora in the affected ears by prior empirical antibiotic therapy or may be due to presence of anaerobic organism.

The sensitivities of most bacteria isolated in this study are comparable to the reports of most investigators. Most of the investigators reported high sensitivity rate for *Pseudomonas* and *Staphylococci* spp. to ciprofloxacin,[5,9,12,13,14] though emergence of ciprofloxacin-resistant *Pseudomonas* in CSOM is being reported.[15] Overall, we found that the most effective antibiotics tested was gentamicin (Aminoglycoside) followed by ciprofloxacin, which is in agreement with the report of other investigators in which the sensitivities to aminoglycosides (Amikacin and Gentamicin) approach 100%. [5,8,14] However, in other reports, ciprofloxacin was found to be the most effective antibiotics.[10,12,13] Since *pseudomonas* is by far the predominant bacteria isolated in most CSOM and is mostly highly sensitive to ciprofloxacin which has none of the ototoxic risks of aminoglycosides, it may be beneficial to concluded that ciprofloxacin ear drops be adopted as a first line antimicrobial treatment for CSOM.

CONCLUSION

Pseudomonas aeruginosa was the most common isolated bacteria in both unilateral and bilateral CSOM and was highly sensitive to gentamicin and ciprofloxacin antibiotics.

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