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Research Article

Microbiological profile of Chronic Suppurative Otitis Media

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Abstract

Background: In Chronic Suppurative Otitis Media (CSOM), the spread of micro organisms to adjacent structures can result in a broad range of intracranial and extracranial complications.
Objectives: To study the microbiological profile of Chronic Suppurative Otitis Media
Materials & Methods: Ear swabs were collected & cultured from 200 patients with purulent discharge from perforated tympanic membranes attending the ENT clinic. The organisms isolated were identified by standard microbiological methods & antibiogram pattern was determined.
Results: The most common organism isolated was *Pseudomonas aeruginosa* [83 (41.5%)] followed by *Staphylococcus aureus* [60 (30%)]. Most of the isolates (90%) in our study were sensitive to Amikacin
Conclusion: The knowledge of the local pattern of infection is essential for starting empirical therapy & reducing the potential risks of complications.
Keywords: Chronic Suppurative Otitis Media; Antibiotic Resistance; Amikacin

1. Introduction

Chronic suppurative otitis media (CSOM) is a condition of the middle ear that is characterised by persistent or recurrent discharge of three months or more through a perforation of the tympanic membrane. Due to the perforated tympanic membrane, microorganisms can gain entry into the middle ear via the external ear canal. Infection of the middle ear mucosa subsequently results in ear discharge.[1]

These may be related to the spread of micro organisms to adjacent structures of the ear or may cause local damage in the middle ear itself. Untreated cases of CSOM can result in a broad range of intracranial and extracranial complications. The complications range from persistent otorrhoea, mastoiditis, labyrinthitis, facial nerve paralysis to more serious intracranial abscesses or thromboses.[2,3]

The goals of management are to achieve a safe, dry ear, eradicate disease and improve hearing. The knowledge of the local pattern of infection is essential to enable efficacious treatment of this disease & there by reducing the potential risks of complications.[4]

Microbiological predominance and their antibiotic sensitivity pattern change over time.[5] Moreover, the wide spread use of antibiotics has changed the microbiological flora. Hence the study of microbiological profile is necessary for the better management of CSOM .The aim of our study was to determine the microbial profile & their antibiogram pattern & to prepare a protocol for empircal antibiotic therapy based on the local pattern of microbial isolates

2. Materials & Methods

Around 200 patients with perforated tympanic membranes with active purulent discharge, attending the ENT clinic (both OPD/IP) who had not received any antibiotic therapy (topical or systemic) for previous five days were included in our study.

Sterile swabs were used to collect middle ear discharge through the tympanic membrane perforation. All care was taken to avoid surface contamination and the swabs transported to microbiology section for further processing. The pus swabs were processed for Gram stain & cultured on Bloodagar MacConkey's agar & Sabourauds dextrose agar & incubated at 37º C for 24-48 hours.

The bacterium isolated were identified by standard microbiological methods & Antibiotic Sensitivity Testing was done by Modified Kirby Bauer Disc diffusion method based on CLSI guidelines.[6,7] The fungus isolated on Sabourauds dextrose agar were further identified by LPCB mount.

3. Results

In our study, out of 200 patients 104 were males and 96 were females as shown in table 1.The patient's age ranged from 1 to 70 years. . Most of the patients were of age group < 10 years (35%), followed by 11-20 years (31%) as shown in table 2. The type of organisms isolated is shown in table 3. The antibiogram pattern of *Pseudomonas aeruginosa* ,*Staphylococcus aureus* & Enterobacteriaceae family i.e *Klebsiella pneumoniae, Escherichiae coli, Proteus* species are given in Table no 4, 5 & 6 respectively.

Table 1: Distribution of patients based on different age groups

Age	Number (Percentage)	
< 10 years	78	(39%)
11-20 years	54	(27%)
21- 30 years	30	(15%)
31-40 years	18	(09%)
41-50 years	14	(07%)
51-60 years	04	(02%)
> 61 years	02	(01%)

Table 2: Distribution of patients based on Gende

Gender	Number	(Percentage)
Male	104	(52%)
Female	96	(48%)

Table 3: Type of organisms isolated from CSOM patients

Microorganisms	Number	(Percentage)
Pseudomonas aeruginosa	83	(41.5%)
Staphylococcus aureus	60	(30%)
Klebsiellapneumoniae	20	(10%)
Escherichiae coli	19	(9.5%)
Proteus spp	11	(5.5%)
Fungi	05	(2.5%)
Contaminants	02	(1%)

Table 4: Antibiotic Sensitivity pattern of *Pseudomonas aeruginosa* (83)

Antibiotics	Sensitive	(Percentage)
Amikacin	76	(91.56%)
Ciprofloxacin	39	(46.98%)
Ceftazidime	46	(55.42%)
Piperacillin	56	(67.46%)
Tobramycin	53	(63.85%)
Piperacillin / Tazobactum	78	(93.97%)
Imipenem	83	(100%)

Table 5: Antibiotic Sensitivity pattern of *Staphylococcus aureus* (60)

Antibiotics	Sensitive	(Percentage)
Cotrimoxazole	44	(73.33%)
Ciprofloxacin	52	(86.66%)
Erythromycin	56	(93.33%)
Amikacin	54	(90%)
Cefoxitin	60	(100%)
Linezolid	60	(100%)
Teicoplanin	60	(100%)
Vancomycin	60	(100%)
Chloramphenicol	56	(93.33%)

Table 6: Antibiotic Sensitivity pattern of Enterobactericiae family - *E.coli, klebsiella, Proteus* (50)

Antibiotics	Sensitive	(Percentage)
Ampicillin	5	(10%)
Amikacin	47	(94%)
Cotrimoxazole	11	(22%)
Ciprofloxacin	27	(54%)
Cefuroxime	26	(52%)
Ceftriaxone	29	(58%)
Imipenem	50	(100%)
Aztreonam	38	(76%)

4. Discussion

Identification of micro organisms is important for prescribing appropriate treatment as a wide range of Organisms- both aerobic & anaerobes are isolated in CSOM. The organisms may spread to adjacent structures near the ear or cause local damage to the middle ear itself. Untreated cases of CSOM may result in a broad range of intracranial and extracranial complications. Early bacteriological diagnoses of all cases will ensure accurate and appropriate therapy.

In our study, the majority of the patients belonged to the age group of 1-10 years (35%). This is in accordance with study done by Wariso *et al*.[8] The high incidence of the CSOM in this age group is due to short & wider eustachian tube, mothers breast feeding the child in supine position. This is in consistent with studies done by different workers.[8,9]

Out of 200 micro organisms isolated from our study, the predominant bacterium was *Pseudomonas aeruginosa* 83 (41.5%) followed by *Staphylococcus aureus* 60 (30%). This finding is in accordance with studies done by different investigators. [9,10]

Some workers have reported *Staphylococcus aureus* is a predominant isolate followed by *Pseudomonas aeruginosa*.[11] The findings observed from different studies indicate the variations in micro organisms could be due to the climate , antibiotic usage & geographical factors. [12]

In our study; based on the antibiogram pattern, 90% of the isolates which includes *Pseudomonas*, *Staphylococci* and members of Enterobacteriaceae family were sensitive to Amikacin. Our observations are consistent with other studies done, which also report Amikacin is the most effective drug[13]. This is in contrast with a study conducted by Moorthy *et al* in which they reported Ciprofloxacin is the most effective drug.[14]

5. Conclusion

Microbial predominance and their antibiotic sensitivity pattern change over time due to the climate , antibiotic usage & geographic factors. So periodical monitoring of microbiological profile of CSOM cases is essential for making effective empirical protocol for the cases in the particular locality. The findings of our study suggest that the empirical treatment with Amikacin might successfully shorten the course of the disease & halt various complications associated with it.

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