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Research Article

BACTERIAL PROFILE AND ANTIBIOTIC SUSCEPTIBILITY PATTERN OF CHRONIC SUPPURATIVE OTITIS MEDIA IN A TERTIARY TEACHING HOSPITAL, CHINAKAKANI, ANDHRA PRADESH

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ABSTRACT

Background: Chronic suppurative otitis media (CSOM) is a potentially serious disease because of its complications. Change in the bacteriological profile with indiscriminate use of antimicrobial agents has been associated with the emergence of multiple drug resistant strains.

Objective: The aim of the study is to isolate & identify the common bacteria causing CSOM & determine their antimicrobial susceptibility pattern.

Materials & Methods: Ear swabs were collected & cultured from 55 patients with purulent discharge from perforated tympanic membranes attending ENT OPD. The organisms isolated were identified by standard microbiological methods & antibiogram pattern was determined.

Results: Analysis of bacterial flora of the present study showed predominance of Gram negative bacilli (65.45%). The most common organism isolated was *Pseudomonas aeruginosa* (40%) followed by *Staphylococcus aureus* (20%). Five samples grew anaerobes (9.09%). Ceftazidime was found to be the most effective drug followed by amikacin. All the anaerobic bacteria were susceptible to metronidazole.

Conclusion: The knowledge of the local pattern of the infection is essential for starting empirical therapy and reducing the potential risks of complications.

INTRODUCTION

Chronic suppurative otitis media (CSOM) is characterized by persistent discharge from the middle ear through a tympanic membrane perforation, Yousuf et al. (2012). It is a disease of multiple etiologies and is well known for its persistence and recurrence in spite of treatment COSM is the leading cause of preventable hearing loss in the developing world, Rama Rao (1980). The complications range from persistent otorrhoea, mastoiditis, labyrinthitis, facial nerve paralysis to more serious intracranial abscesses or thromboses, Shrestha (2011). 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, Singh (2012). Bacterial predominance and their antibiotic sensitivity pattern change over time, Madana et al. (2011). More over, the wide spread use of antibiotics has changed the microbiological flora.

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Hence the study of microbiological profile is necessary for the better management of CSOM. Therefore, this study was conducted to know the trend of prevalence and antibiogram profile of bacterial agents of CSOM to prepare a protocol empirical antibiotic therapy based on the local pattern of microbial isolates.

MATERIALS AND METHODS

Clearance from concerned authority and informed consent of patients were taken. Fifty five chronically diagnosed cases CSOM formed the subject matter of the study. Patients who were not on prior antibiotic treatment either systemic or local were considered. Three sterile ear swabs were used to collect ear discharge from CSOM patients. The pus swabs were processed for gram stain & cultured on Blood agar, MacConkey's agar, Chocolate agar, anaerobic blood agar & Brain –heart infusion agar. The bacteria were identified with standard biochemical tests. Antibiotic susceptibility was carried out using Kirby-Bauer Disk diffusion method. Results were interpreted using Clinical Laboratory Standards Institute (CLSI) guidelines, (National Committee for Clinical Laboratory Standards 2001).

RESULTS

Out of Fifty five patients studied, 30 were males and 25 were females. (Table-1).

Table 1. Gender – wise distribution of patients

Gender	Number of cases	% Percentage
Male	30	54.54%
Female	25	45.45%

Analysis of these patients in both genders and all age groups revealed that 45.45% were in the age group of 0-20 yrs, 29.09%, 18.18% & 7.27% patients in age groups 21-40 yrs, 41-60 yrs & beyond 60 years respectively (Table-2). Gram negative bacilli were the predominant bacteria isolated 36 (65.45%) followed by 14(25.45%) Gram positive cocci & 5 (9.09%) anaerobes.

Pseudomonas aeruginosa was the most predominant species in 20(40%), specimens, followed by *Staphylococcus aureus* in 10(20%), specimens. Other isolates were *Proteus mirabilis* 7(14%), *Klebsiella pneumoniae* 5 (10%), *Escherichia coli* 4 (8%), *Coagulase negative Staphylococci* 2(4%), *Pneumococci* & *Enterococci* in one each (2%) (Figure-2). *Bacteroides spp* was the commonest anaerobe isolated (40%) followed by *Peptostreptococci* (20%), *Fusobacterium* (20%) & *Propionibacterium* (20%) (Table-3) (Figure-1). Ceftazidime was the most effective antibiotic in the present study (75%) followed by Amikacin (70%) & Gentamicin (45%). 100% susceptibility was seen to Metronidazole in anaerobic organisms.

DISCUSSION

COSM is a condition of the middle ear that is characterized by persistent or recurrent discharge through a chronic perforation of the tympanic membrane.

Table 2. Age– Wise distribution of patients

Gender	0-20 Years	Total %	21-40 Years	Total %	41-60 Years	Total %	61 and above	Total %
Male	15	27.27	10	18.18	6	10.90	2	3.63
Female	10	18.18	6	10.90	4	7.27	2	3.63
Total	25	45.45%	16	29.09%	10	18.18%	4	7.27%

Table 3. List of organisms isolated

Organisms	Number of isolates	Percentage
Gram Negative Bacilli		
Pseudomonas aeruginosa	20	40%
Proteus mirabilis	7	14%
Klebsiella pneumoniae	5	10%
Escherichia coli	4	8%
Gram Positive Cocci		
Staphylococcus aureus	10	20%
Coagulase Negative Staphylococci	2	4%
Streptococcus pneumoniae	1	2%
Enterococci	1	2%
Anaerobes		
Bacteroides species	2	40%
Peptostreptococci	1	20%
Fusobacterium	1	20%
Propionibacterium	1	20%

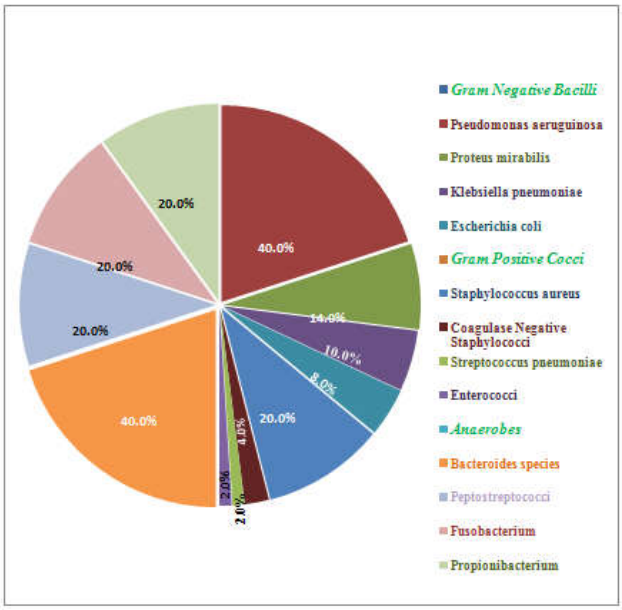

Figure 1. List of Isolated Organisms

Identification of microorganisms is important for prescribing appropriate treatment as a wide range of organisms –both aerobes & anaerobes are isolated in COSM. The organisms may spread to adjacent structures near the ear or cause local damage to the middle ear itself. Untreated cases of COSM may result in a broad range of intracranial & extra cranial complications. Early bacteriological diagnoses of all cases will ensure accurate & appropriate therapy. In this study, COSM was more common in males compared to females. It is in accordance to other studies, Kumar (2011). Out of the 55 cases of COSM studied, maximum number of cases (45.45%) was observed in the 0-20 yrs age groups which corresponds with the work published by other authors, Nandy et al. (1991).

Because of variation in climate, community, patient characteristics, the pattern of microbiological distribution varies in COSM. Majority of bacterial isolates in our study were *Pseudomonas aeruginosa* (40%), followed by *Staphylococcus aureus* (20%), *Proteus mirabilis* (14%), *Klebsiella pneumoniae* (10%), *Escherichia coli* (8%), *Coagulase negative Staphylococci* (4%) & *Pneumococci* and *Enterococci* (2%). These results were in concordance with other studies, Mansoor et al (2009). Commonest anaerobe isolated was *Bacteroides spp* (40%), followed by *Peptostreptococci* (20%), *Fusobacterium* (20%) & *Propionibacterium* (20%). The most effective drugs in the present study were ceftazidime, amikacin and gentamicin.
All the anaerobes showed 100% susceptibility to metronidazole. One important fact to be kept in mind is that the antibiotic susceptibility pattern of the COSM causing organisms keeps changing. The present study has a limitation in that the sample size was not very large & a larger sample size is necessary before generalizing that results to the whole population.

Conclusion

Microbiological predominance and their antibiotic sensitivity pattern change over time due to the climate, antibiotic usage & geographic factors.

Hence it is prudent for any health center catering to a defined area of population to conduct periodically the microbiological study of COSM in order to install effective treatment protocols for the population. We believe that our data may contribute to an effective management of COSM.

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