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Research Article

BACTERIOLOGICAL PROFILE AND THEIR ANTIBIOTIC SUSCEPTIBILITY PATTERN OF CASES OF CHRONIC SUPPURATIVE OTITIS MEDIA

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ABSTRACT

Chronic Suppurative Otitis Media (CSOM) is one of the common hearing problems which can cause many complications if not treated properly. Hence, the aim of the study is to identify the bacterial isolates causing CSOM and to study their antimicrobial susceptibility pattern. The study was carried out in a tertiary care hospital in Chennai from August 2012 to January 2013 for a period of six months. Eighty patients of CSOM with unilateral or bilateral discharge attending the ENT Out Patient Department were included in the study. Swabs were taken and sent immediately to the microbiology laboratory and processed. Bacterial isolates were identified using standard methods and antibiotic susceptibility testing was done. Staphylococcus aureus was the most predominant organism isolated followed by Pseudomonas sp., Escherichia coli, Klebsiella sp.. The present study helped in knowing the bacteriological profile of the cases of CSOM. Empirical treatment may not be successful in all cases because of emergence of resistant organisms. Hence it is advisable to do antibiogram before starting the streatment.

Keywords: Chronic Suppurative Otitis Media, bacterial isolates, antibiotic susceptibility

INTRODUCTION

Chronic Suppurative Otitis Media is a chronic inflammation of middle ear due to various causes. It is famous for its recurrence and persistant infection. It is one of the common causes of deafness and can also cause permanent perforation [1]. CSOM occurs due to various reasons.

The disease usually occurs after upper respiratory viral infections followed by invasion of pyogenic organisms [2]. Many studies have showed that the common organisms isolated from cases of CSOM are found to be *Pseudomonas* sp.*, Staphylococcus aureus, Klebsiella pneumoniae* and *Proteus* sp..

CSOM can cause severe adverse effects like intra and extracranial complications which can be life threatening. The incidence of CSOM is increasing in the developing countries because of the poor hygienic practices and lack of health education. The complications of CSOM have been reduced to a greater extent because of the invention of antibiotics. But irrational use of antibiotics has lead to the emergence of resistant organisms to the commonly used drugs.

Hence this study is carried out to know the bacterial etiology of CSOM and their antibiotic susceptibility pattern. This knowledge is very important for the clinicians for appropriate management of the cases and to prevent or minimise the occurrence of complications. Treatment of the cases after studying the antimicrobial susceptibility pattern will help in preventing the emergence of resistant strains in the community.

MATERIALS AND METHODS

This study was carried out in a tertiary care hospital in Chennai from August 2012 to January 2013. Ethical committee approval was obtained before starting the study. Eighty patients with symptoms of CSOM who were not on antibiotics were included in the present study. Ear discharge were collected from them under strict aseptic precautions using two sterile cotton swabs with the assist of aural speculum and processed immediately in the microbiology laboratory. The first swab was used for direct Gram stain and the second swab was cultured in nutrient agar, blood agar and Mac conkey agar plates and incubated at 37^0 C for 24 – 48 hrs. The isolates grown were identified by their cultural characteristics, morphology and biochemical reactions. Antibiotic susceptibility testing of the organisms diagnosed was done by Kirby Bauer method in Muller Hinton agar. The plates were read after overnight incubation at 37^0 C by measuring the zone of inhibition around the antibiotic discs as per CLSI (Clinical Laboratory Standards Institute) guidelines.

RESULTS

The study was carried out in a total of 80 patients comprising 36 males and 44 females.

Table 1: Sex distribution of cases:

Sex	Number	%
Male	36	45%
Female	44	55%

Among the 80 samples, 75 were culture positive.

Table 2: Organisms isolated from culture:

Micro organism	No.of cases	Percentage %
Staphylococcus aureus	33	41.25
Coagulase negative taphylococcus	9	11.25
Escherichia coli	4	5
Klebsiella pneumonia	6	7.5
Proteus sp.	4	5
Pseudomonas sp.	30	37.5

Five samples were culture negative. 15% of the samples showed mixed growth.

The most common organism isolated in this study was *Staphylococcus aureus* (41.25%) followed by *Pseudomonas* species (37.5%). *Klebsiella pneumoniae, Escherichia coli, Proteus* sp, and Coagulase Negative Staphylococcus were the other organisms isolated.

Among the *Staphylococcus aureus*, 18% were Methicillin resistant *Staphylococcus aureus* (MRSA). The organism was highly sensitive to amikacin, chloramphenicol, piperacillin.

Pseudomonas sp was 100% sensitive to imipenem. *Pseudomonas* sp. showed 91% susceptibility to amikacin, 88% susceptibility to gentamicin, 60-68% to cephalosporins and 60-63% to fluoroquinolones.

Escherichia coli and *Klebsiella pneumoniae* were 100% susceptible to imipenem and 72 – 80% susceptible to amikacin, gentamicin and 65-72 % susceptible to cephalosporins.

DISCUSSION

CSOM is one of the common ear infections which is more reported from rural population and lower socio economic status group [3,4]. It is a chronic infection of middle ear which can even lead to deafness. Poorly treated or untreated CSOM can lead to many complications like mastoiditis, meningitis and brain abscess. Hence, diagnosis of the causative organism is necessary for proper management of CSOM cases. In our study, Majority of the patients were less than 20 years of age, which is in agreement with the previous literature [5,6]. In contrast, Loy *et al* showed the increased prevalence of CSOM in 30 - 40 years age in his study [7]. In our study, 45% were males and 55% were females. Thus females were affected more in our study which is in accordance with Loy *et al* [7], but differ from Ahmed *et al* [8] who showed 57.3% male and 42.7% female affected by CSOM.

Monomicrobial growth was seen in 85% of cases, which is similar to the previous study by Agarwal *et al* [9]. In our study, five of the samples (6.25%) showed no growth. This is in accordance with Vijaya *et al* [10] who found 5.28% sterile samples in their study whereas Fatma *et al* [11] (16.9%) and Chakraborty *et al*[12] (12.6%) found higher percentage of culture negative samples in their studies.

The predominant organism isolated in our study was *Staphylococcus aureus* (41.25%) followed by *Pseudomonas* sp. (37.5%). This is in accordance with the previous studies [13,14]. Taneja Mansi *et al* [15] had isolated *S.aureus* as the most common organism in their study, but the percentage of isolation (33.3%) was lesser when compared to our study. Kuchal *et al*[16] also showed that in his study in 75 patients, *S. aureus* was the most common isolate followed by *Pseudomonas sp.*. Shyamala *et al* [17] also has found out that these two were the predominant organisms isolated from the otitis media cases.

Many of the previous studies showed *Pseudomonas* to be the most common bacteria isolated from CSOM cases [18,19,20,21]. But *Pseudomonas* sp. was the second most common organism in our study, isolated from 37.5% cases. This is similar to a study by Sharma *et al* [22] who reported Pseudomonas in 36% cases. In our study, *Staphylococcus aureus* and *Pseudomonas sp.* together account for about 78.75% of cases, which is in accordance with the study by Aslam *et al* [23].

Coagulase negative Staphylococcus was the next common organism isolated. It is usually considered as commensal organism of the skin, but rarely can become an opportunistic pathogen. Among the gram negative pathogens, next to *Pseudomonas, Klebsiella pneumoniae* (7.5%) was the other common pathogen followed by *Escherichia coli and Proteus sp.* (5% each).This is similar to study by Loy *et al* [7].

Antibiotic susceptibility pattern was tested for all the isolated organisms. Most of the isolates were found to be susceptible to amikacin. But, almost 85% of the organisms showed resistance to amoxicillin which is in accordance with Chakraborty *et al* [12] (95.4%) and Malkappa *et al* [21] (90%). *Staphylococcus aureus* was found to be highly susceptible to chloramphenicol and piperacillin followed by cephalosporins and quinolones. The gram negative isolates were fairly susceptible to ciprofloxacin, third generation cephalosporins and gentamicin. One important fact to be kept in mind is that the antibiotic susceptibility pattern of the CSOM causing organisms keeps changing. Hence, routine antibiotic susceptibility testing before treatment is recommended.

CONCLUSION

Staphylococcus aureus and *Pseudomonas* sp. were found to be the common cause of CSOM in our study. These organisms are found to be less susceptible to the routinely used drugs like ciprofloxacin and cephalosporins. Also the resistance pattern of the micro organisms usually keeps changing. Hence, Routine use of topical antibiotics for any case of CSOM as empirical therapy must be reviewed and judicial use of antibiotics is recommended. Appropriate antimicrobial drugs should be prescribed after proper diagnosis of the causative organism and its antimicrobial susceptibility pattern. The patients should also be advised to take the drugs for the complete prescribed duration without stopping in the middle. This will not only help in minimising the complications, but also help in preventing the emergence of resistant strains.

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