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Research article

STUDY OF BACTERIOLOGY IN CHRONIC SUPPURATIVE OTITIS MEDIA

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ABSTRACT

The present study was to know the different etiological aerobic and anaerobic bacteria in chronic suppurative otitis media and also its antibiogram. **Methods:** The total 128 specimens collected by aseptical conditions and examine microscopically and cultured for bacteria, antibiotic sensitivity testing was done by Kirby Bauer disk diffusion method. **Result:** The bacteriological study's on the 128 cases 124 samples yielded growth and 4 were sterile. On culture positives 84 were pure isolates and 40 were mixed isolates. In single organism isolates 78 were aerobic and 6 were anaerobic organism in mixed infection 40 cases aerobic organisms. **Conclusion:** The study revealed aerobes as prominent causative agents of CSOM (61%) followed by mixed isolation (31%) and anaerobes (5%) highest incidence is observed age group of 0-20 years. The prevalence is more in males.

Keywords: Chronic suppurative otitis media, aerobic, anaerobic bacteria & antibiogram

INTRODUCTION

Chronic suppurative otitis media (CSOM) is characterized by a long standing inflammation of the middle ear[1]. CSOM was found to be a single major cause of conductive deafness and was responsible for 60.27 % of cases[2]. The incidences are so high that about 30% of patients who attend ENT out patient department suffer from CSOM. Otitis media is an inflammation of the middle ear and mastoid cavity. This presents with recurrent ear discharges are otorrhoea through a tympanic membrane. Otitis media may also be categorized as acute, sub-acute, chronic, with discharge or without discharge[3]. The recurrent episodes of otorrhoea and mucosal changes are characterized by osteoneogenesis bony erosions and osteitis that include temporal bone and ossicles[4]. The understanding of pathology and bacteriology of otitis media assumes practical significance in the prevention of disease or minimize the complications.

In CSOM the wide range of microorganisms both aerobic (eg: *Pseudomonas aeruginosa*, *Escherichia coli*, *streptococcus pyogenes*, *proteous mirabils*, *klebsiella species*) and anaerobic (*eg: Bacteroids*, *Peptostreptococcus*, *Propioni bacterium*) and fungi (eg: *Candida*,

Aspergillus, Penicillium and Rhizopus) are associated[5] . The bacteria are frequently found in the skin of external canal, but may proliferate in the presence of trauma, inflammation, lacerations are high humidity. These bacteria may entry to the middle ear through a chronic perforation. Among these bacteria *Pseudomonas aeroginosa* has been particularly blamed for deep seated and progressive destruction of middle ear and mastoid structures through its toxins and enzymes [6].

The present work was undertaken to study the aerobic as well as the anaerobic flora involved in the causation of CSOM and the antibiotic susceptibility pattern.

MATERIALS AND METHODS

The present study consists of the total number of 128 specimens of ear discharge from patients suffering with chronic suppurative otitis media attended ENT O.P and ward of either sex in Government General Hospital, Karnool during the period 2006 June to December 2006.

Inclusion criteria: None of them had received antibiotics for earlier seven days. Purulent discharge samples from the clinically diagnosed cases of CSOM

The ear discharge collected by using 3 sterile cotton swabs under aseptic conditions. A 1st swab was dipped immediately in Hartley's broth for aerobic culture. The 2nd swab was dipped immediately in thioglycollate medium for anaerobic culture. The 3rd swab was used for smear preparation & stained with grams staining and then examine microscopically for bacteria, inflammatory cells, epithelial cells & pus cells etc.

The first swab was sub cultured on blood , macconkeys and chocolate agar and incubated aerobically at 37°C for an overnight, The 2nd swab was sub cultured on blood agar and chocolate agar and incubated anerobically at 37°C for an over night, all organisms isolated were identified according to standard microbiological methods and mentioned in the Tables: 01,02 and 03.

Antimicrobial susceptibility test was performed using Kirby-Bauer disk diffusion method according to practical medical microbiology text book guide lines[7] antimicrobial discs (Himedia laboratories Pvt Ltd), used were Amikacin (30µg) (AK-SD035), Gentamicin (10µg) (GEN-SD016), Ofloxacin (5µg) (OF-SD087), Ceftazidime (30µg)(CAZ-SD062), Pipercillin (100µg)(PI-SD066), Ciprofloxacin (5µg)(CIP-SD060), Co-trimoxazole (25µg) (COX SD071), Ampicillin (10µg) (AMP-SD0002), Cloxacillin (10µg) (CM-SD008) and Vancomycin (10µg) (VA-SD163),

RESULTS

In this study 61 % of patients were males and 44% were females patients ranged from 0-62 years with the majority of them (80%) belonged to 0-20 years of age. The results of the bacteriological studies on the 128 cases 124 samples yielded growth and 4 were sterile. On culture positives 84 were pure isolates and 40 were mixed isolates. In single organism isolates 78 were aerobic and 6 were anaerobic organism in mixed infection 40 cases aerobic organisms.

Table.1: Type of growth, Amount of isolates and Percentage

Type of organism		**Amount of isolates**	**Percentage**
Pure growth-	Aerobes	78	65
	Anaerobes	06	5
Mixed growth		40	31
No growth		04	3
Total growth		**128**	**100**

Pseudomonas species 37 (31.65) was the commonest microbial organism to cause ear discharge followed by *staphylococcus aureus* 29 (24.45) and *Proteus mirabilis* 19 (16.1%)

Table.2: Name of the isolated aerobic organism, Number and Percentage

Organisms	Number	Percentage
Pseudomonas aeruginosa	37	31.6
Staphylococcus aureus	29	24.5
Proteus mirabilis	19	16.1
Klebsiella pneumonia	16	13.5
Escherichia coli	7	5.93
Coagulase negative staphylo cocci	5	4.23
Streptococcus pneumonia	4	3.9
Entero cocci	1	0.84
Total	118	100

Among anaerobic isolates *Bacterioides species* 18(39.1%) commonest microbial organism followed by *peptostreptococci* 13 (28.26%) and *fuso bacterium* 5(10.87%)

Table.3: Name of the isolated anaerobic organism, number and percentage

Organisms isolated	Number	percentage
Bacterioides fragilis	18	39.13
Bacterioides melaninogenicus	6	13.04
Peptostreptococci	13	28.26
Fusobacterium	5	10.87
Veillonella	2	4.35
Propionibacterium	2	4.35
Total	46	100

The antimicrobial sensitivities of the bacteria were tested and the results for most common bacteria include *Pseudomonas aeruginosa* was shown to be susceptible to ceftazidine Amikacin, co-trimoxazole oflaxacin,gentamicin while *staphylococcus aureus* was sensitive to ceftazidine,oflaxacin erythromycin, Gentamycin & Amikacin and *Bacterioides species* were more susceptible to Chloram phenicol and Metronidazole

DISCUSSION

Chronic suppurative otitis media (CSOM) is a condition of the middle ear that is characterized by persistent or recurrent discharge through a chronic perforation of tympanic membrane. Due to the perforated tympanic membrane, the bacteria can gain entry into the middle ear via the external ear canal. Infection of the middle ear mucosa subsequently results in ear discharge. Early bacteriological diagnosis of all cases will assure accurate and appropriate effective therapy. Treatment hence needs to be instituted early and effectively to avoid complications.

Based on results from present study, the most common aerobic organisms of CSOM were *P. aeruginosa, S.aureus, P. mirabilis* and *Klebsiella*. These findings correlate with earlier studies[8,]. Similarly, *P. aeroginosa* was the most prevalent organism followed by *S. aureus*, isolated from CSOM cases reported in several studies[9,10]. With the development and widespread use of antibiotics, the types of pathogenic microorganisms and their resistance to antibiotics have changed[11].

Ceftazidime was found to be the most sensitive antibiotic from the antimicrobial profile of testing microorganisms which is also comparable to the study done by S.Nikakhlagh et al [12].Almost all isolates were sensitive to

Ceftazidine. *Pseudomonas aeruginosa, Escherichia coli* and *Klebsiella sp.* showed 76.2% sensitivity to Amikacin. *Pseudomonas aeruginosa* were sensitive to aminoglycosides, i.e., Amikacin and Gentamicin and it is also supported by previous studies in Nepal [13], India and Mansoor T et al (2009) [14], Chloram phenicol and metronidazole were found to be most sensitive antibiotics of anaerobic organisms[15]. *Bacterioides species, peptostrepto cocci* and *fusobacterium,* Lower sensitivity rate of penicillin (14.4%) was comparative study done by Indudharan et al[15].In accordance to our study shows 88% of isolates were found to be sensitive to ceftazidime. The antibiotic sensitivity pattern of *Staphylococcus aureus* in our study revealed that 76.2% to Amikacin, 63.6% to Gentamicin, and 69% to ofloxacin.

CONCLUSION

The present study suggests that the common etiological agents for Chronic Suppurative Otitis Media were aerobic organisms *Pseudomonas aeruginosa, Staphylococcus aureus* and anaerobic organisms were *Bacterioides species, peptostreptococci* and *fusobacterium.* The antimicrobial susceptibility studies showed ceftazidine and chloramphenicol as the most effective antibiotics, the highest incidence observed in the age group of 0-20 years and the prevalence is more in male.

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REFERENCES

1. Goycoolea M, Ruah L. Definitions and Terminology. Otol Clin of North Am. 1991; 24:757-61.

2. Ogisi FO. Impedance screening for otitis media with effusion in Nigerian children. J.L.O.1988; 102:986-88.

3. Okafor B.C.. The chronic discharging ear in Nigeria , J.L.O 1984, 98:113-9.

4. Daly KA, Hunter LL, Levine SC, et al. Classification of otitis media. Laryngoscope 1998; 108:1306–10.

5. Shazia Parveen SJ. Aerobic bacteriology of CSOM in ateaching hospital. Microbiol and Biotech.Res. 2012, 2(4); 108:1306-10.

6. Hayne DS. Properative antibiotics in CSOM . Ear Nose Throat J 2002. 81: 13-15.

7 Mackie & Mc cartney practical medical microbiology 14th edition.2006; 151-62.

8 Saini S, Gupta N, Aparna, Seema, Sachdeva OP. Bactriological study of paediatric and adult CSOM . Indian J Pathol Microbiol 2005; 48:413–16.

9 Shyamala R and Sreenivasulu Reddy P.The study of bacteriological agents of CSOM . J. Microbiol & Biotech. Res. 2012; 2 (1):152-62.

10 Smith JA and Danner CJ. CSOM and cholsteatoma. Otolaryngol. Clin. North Am., 2006; 39: 1237-55.

11 Yeo SG, Park DC, Hong M, Cha CI and. Kim MG, Bacteriology of CSOM –a multicenter study. Acta Otolaryngol. 2007; 127: 1062-67.

12 Nikakhlagh S, Khosravi AD, Fazlipour A, Safarzadeh M and Rashidi N. Microbiologic findings in patients with CSOM. Journal of Medical Sciences . 2008; 8: 503-06.

13 Sharma S, Rehan HS, Goyal A, Jha AK, Upadhyaya S and Mishra SC.Bactriological Profile in CSOM. Trop Doct 2004; 34:102–4.

14 Mansoor T, Musani MA, Khalid G, Kamal M. Pseudomonas aeruginosa in CSOM . J Ayub Med Coll Abbottabad. 2009; 21(2):120-3.

15 Indudharan, Haq JA And Aiyar S. Antibiotic study in CSOM. Ann. Otol.Rhino laryngol.1999; (5):440