

ORIGINAL ARTICLE

To investigate the microbial flora present in cases of chronic suppurative otitis media

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ABSTRACT:

Aim: To investigate the microbial flora present in cases of chronic suppurative otitis media. **Materials and method:** It's a descriptive prospective observational type of study conducted at department of ENT. Patients visiting the ENT OPD with active discharge in both safe and unsafe type of CSOM were first examined under microscope and included in the study. Aural swabs were collected from the diseased ear after cleaning external auditory canal with spirit swab. All specimens were processed for the identification of aerobes, anaerobes and fungal isolates. For aerobic and facultative organisms' specimen were inoculated onto 5% sheep blood agar, chocolate agar and MacConkey agar plates for at 37°C and examined at 24 and 48 h. **Results:** In our study we have taken samples from 130 patients, 80 patients (61.54%) had tubotympanic type while 50 patients (38.46%) had atticofacial type of CSOM. Microbial growth was obtained in 111(85.38%) samples, 19 had no growth (14.62%) being monomicrobial in 106 (81.54%) while mixed growth was obtained in 5 (3.85%) samples. Among 80 patients of tubotympanic CSOM, the most common isolates were *P. aeruginosa* (32.50%) and *S. aureus* (30%) followed by *E. coli* (8.75%), *Proteus* (3.75%) and coagulase-negative Staphylococci (CONS) (1.25%). No growth was observed in 10 (12.50%) samples. Among 50 patients of atticofacial-type CSOM, the major isolate was *P. aeruginosa* (42%) followed by *S.aureus* (22%), CONS (6%), *Proteus mirabilis* (6%) and *E. coli* (2%). Fungal positivity was observed in 7 (8.75%) cases of tubotympanic CSOM only. No fungal growth was seen in atticofacial disease. Anaerobes were isolated in 02 samples (1.54%), one each in tubotympanic (1.25%) and atticofacial (2%) type of CSOM. **Conclusion:** In the last few decades CSOM incidence has been reduced with the introduction of advanced diagnostic tools and availability of newer antibiotics, but due to indiscriminate use of antibiotics it has led to a multi-drug resistant bacterial strains and increased related disease complications. In recent times the types of causative pathogenic micro-organisms and their resistance to antibiotics have seen a changing trend.

Keywords: Microbial flora, Chronic suppurative otitis media, Tubotympanic, Atticofacial

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INTRODUCTION

Chronic suppurative inflammation of muco periosteal lining of middle ear cleft with tympanic membrane perforation is termed as chronic suppurative otitis media (CSOM)[1,2]. It can be seen in all age groups but it is more commonly seen in lower socioeconomic population. About 0.5-30% of population in developing and undeveloped countries is suffering from this CSOM[3]. Both Conductive type hearing loss as well as sensorineural type of hearing loss can occur in CSOM patients leading to profound impact on society[4,5]. According to a report published by WHO prevalence of CSOM in India is around 7.8% putting India amongst the countries with highest prevalence of CSOM, and hence immediate attention is required in early detection and management of this public health problem[6]. Depending upon whether the disease affects the pars tensa or pars flaccida of the tympanic membrane CSOM can be classified into two types, tubotympanic and atticofacial[7]. Tubotympanic type is also known as mucosal (safe) disease. Here the infection is limited to the mucosa and the anteroinferior part of the middle ear cleft[8,9]. Where atticofacial type of CSOM is also known as squamousal (unsafe) disease as it can

produce various dangerous intracranial (mastoiditis, facial nerve paralysis, labyrinthitis), as well as extracranial complications. (Lateral sinus thrombosis, meningitis and brain abscess) [10,11]. In recent times CSOM incidence has been reduced after the introduction of various diagnostic tools and newer antibiotics, but on the other hand due to indiscriminate use of antibiotics multi-drug resistant bacterial strains and disease complications have returned with increased rates. Changes in bacterial flora seen in the last decade which has been verified by various authors[12]. Knowledge of the causative organisms and their antibiotic sensitivity is important in deciding the medical management of both safe and unsafe types of CSOM.

MATERIALS AND METHOD

It's a descriptive prospective observational type of study conducted at department of ENT. Patients visiting the ENT OPD with active discharge in both safe and unsafe type of CSOM were first examined under microscope and included in the study. All samples were collected before giving topical or systemic antibiotics to the patient.

Patients with otomycosis, otitis externa, acute

suppurative otitis media, and diabetes mellitus and other immunocompromised states, and patients with recent history of topical or systemic antibiotics usage in last 7 days were excluded from the study.

Aural swabs were collected from the diseased ear after cleaning external auditory canal with spirit swab. Avoiding contamination while collecting pus was utmost priority hence all due aseptic measures were taken care in collecting sample. Patients with bilateral CSOM separate swabs were taken from both ears. All collected specimens were sent to the department of microbiology for culture and sensitivity without any delay. All specimens were processed for the identification of aerobes, anaerobes and fungal isolates. For aerobic and facultative organisms' specimen were inoculated onto 5% sheep blood agar, chocolate agar and MacConkey agar plates for at 37°C and examined at 24 and 48 h. For anaerobes, blood agar plate was used for inoculation with thioglycolate broth and incubated at 37°C examined at 48 and 96 h. fungal growth was processed by direct microscopic examination with potassium hydroxide preparation followed by inoculation on two tubes of modified Sabouraud's dextrose agar. All culture isolates were identified by

standard microbiological methods[13].

RESULTS

In our study we have taken samples from 130 patients, 80 patients (61.54%) had tubotympanic type while 50 patients (38.46%) had atticotympanic type of CSOM. Microbial growth was obtained in 111(85.38%) samples, 19 had no growth (14.62%) being monomicrobial in 106 (81.54%) while mixed growth was obtained in 5 (3.85%) samples. Among 80 patients of tubotympanic CSOM, the most common isolates were *P. aeruginosa* (32.50%) and *S. aureus* (30%) followed by *E. coli* (8.75%), *Proteus* (3.75%) and coagulase-negative Staphylococci (CONS) (1.25%). No growth was observed in 10 (12.50%) samples.

Among 50 patients of atticotympanic-type CSOM, the major isolate was *P. aeruginosa* (42%) followed by *S.aureus* (22%), CONS (6%), *Proteus mirabilis* (6%) and *E. coli* (2%). Fungal positivity was observed in 7 (8.75%) cases of tubotympanic CSOM only. No fungal growth was seen in atticotympanic disease. Anaerobes were isolated in 02 samples (1.54%), one each in tubotympanic (1.25%) and atticotympanic (2%) type of CSOM. (Table 1, 2)

Table 1: Types of Micro Organisms seen in Tubotympanic Type CSOM

Name of organism	Tubotympanic type	%
<i>Pseudomonas aeruginosa</i>	26	32.5
<i>Staphylococcus aureus</i>	24	30
<i>Candida spp</i>	7	8.75
<i>Klebsiella + Pseudomonas</i>	4	5
<i>E. coli</i>	3	3.75
<i>Proteus spp</i>	3	3.75
<i>Klebsiella + CONS</i>	1	1.25
Coagulase negative staphylococci	1	1.25
Anaerobes	1	1.25
No growth	10	12.5
Total	80	100

Table 2: Types of Micro Organisms seen in Atticotympanic Type CSOM

Name of organism	Attico-antral Type	%
<i>Pseudomonas aeruginosa</i>	22	44
<i>Staphylococcus aureus</i>	11	22
<i>Candida spp</i>	0	0
<i>Klebsiella + Pseudomonas</i>	0	0
<i>E. coli</i>	1	2
<i>Proteus spp</i>	3	6
<i>Klebsiella + CONS</i>	0	0
Coagulase negative staphylococci	3	6
Anaerobes	1	2
No growth	9	18
Total	50	100

DISCUSSION

Chronic Suppurative Otitis Media (CSOM) is one of the commonest clinical presentations seen in ENT practice especially in rural parts and lower socioeconomic section of population. Both

Conductive loss as well as sensorineural type of hearing loss can both occur in CSOM patients leading to profound impact on society. Untreated and poorly treated CSOM results has become a major public health problem in developing countries due to its

various complications such as mastoiditis, facial nerve palsy, meningitis, and brain abscess. The treatment of choice is mastoid exploration under peri-operative antibiotic cover. Study conducted by Ahmed S et al [12] suggested that *Pseudomonas aeruginosa* was seen in 40.65% of the cases followed by *Staphylococcus aureus* (14.63 %) and *Klebsiella aerogenes* (11.78%). Another similar Study conducted by Kumar S et al[1] found that majority of bacterial isolates were *Pseudomonas aeruginosa* (34.7%), followed by *Staphylococcus aureus* (18.7%), *Klebsiella aerogenes* (12%). Study conducted by Prakash R et al[11] showed mono-microbial growth was seen in 57.84% and polymicrobial growth in 33.33%, No growth in 8.82% samples, were as in our study we have found that Microbial growth was obtained in 111(85.38%) samples, 19 had no growth (14.62%) being monomicrobial in 106 (81.54%) while mixed growth was obtained in 5 (3.85%) samples. In our study *C. albicans* was the predominant fungal isolate seen in tubotympanic type of CSOM this was in accordance with study conducted by Harvinder et al[13]

CONCLUSION

In the last few decade CSOM incidence has been reduced with the introduction of advanced diagnostic tools and availability of newer antibiotics, but due to indiscriminate use of antibiotics it has lead to a multi-drug resistant bacterial strains and increased related disease complications. In recent times the types of causative pathogenic micro-organisms and their resistance to antibiotics have seen a changing trend. Hence continuous and periodic evaluation of microbiological pattern and its antibiotic sensitivity of isolates has become a necessity to initiate early drug specific treatment leading to prevent potential risk and complications.

REFERENCES

1. Kumar S, Sharma R, Saxena A, Pandey A, Gautam P, Taneja V. Bacterial flora of infected unsafe CSOM. 2012;18(4):208-11.
2. Adhikari P, Sinha BK, Pokhrel NR, Kharel B, Aryal R et al. Prevalence of chronic suppurative otitis media in school children of kathmandu district. Journal of institute of medicine. 2007; 29(3):10-12.
3. Dugdale AE. Management of chronic suppurative otitis media. Med J. 2004; 180(2):91-93.
4. El-sayed Y. Bone conduction impairment in uncomplicated chronic suppurative otitis media. Am J Otolaryngol. 1998; 19(3):149-153.
5. Acuin J. Global burden of disease due to chronic suppurative otitis media: Disease, deafness, deaths and DALYs Chronic Suppurative Otitis Media–Burden of Illness and Management Options. Geneva: World Health Organisation, 2004, 9-23p
6. Kumar H, Seth S. Bacterial and fungal study of 100 cases of chronic suppurative otitis media. J Clin Diagn Res. 2011;5: 12 24-7
7. Rout MR, Mohanty D, Vijaylaxmi Y, Kamallesh B, ChakradharM. Prevalence of cholesteatoma in chronic suppurative otitis media with central perforation. Indian J Otol. 2012;18:7-10.
8. Kenna MA. Microbiology of chronic suppurative otitis media. Ann Otol Rhinol Laryngol. 1988;97:9-10
9. Berman S. Otitis media in developing countries. Pediatrics. 1995; 96(1 Pt 1):126-31
10. Wiwanitkit S, Wiwanitkit V. Pyogenic brain abscess in Thailand. N Am J Med Sci. 2012;4:245-8
11. Prakash R, Juyal D, Negi V, Pal S, Adekhandi S, Sharma M, Sharma N. Microbiology of chronic suppurative otitis media in a tertiary care setup of uttarakhand state, India. N Am J Med Sci. 2013 Apr;5(4):282-7. doi: 10.4103/1947-2714.110436. PMID: 23724403; PMCID: PMC3662095.
12. Ahmed S. Antibiotics in chronic suppurative otitis media, a bacteriological study. Egyptian Journal of Ear, nose, throat and allied sciences. 2013;14(3):191-94.):900-6
13. Harvinder K, Seth S. Bacterial and fungal study of 100 cases of chronic suppurative otitis media. J Clin Diagn Res. 2011; 5:1224-7.