

To Study the Microbiological Flora in Chronic Suppurative Otitis Media At Tertiary Care Center

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Abstract

Introduction: Indiscriminate use of antibiotics multi-drug resistant bacterial strains has increased disease complications. Changes in bacterial flora seen in the last decade which has been verified by various authors. 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 and head & neck surgery, A.B.V Government Medical College, Vidisha, M.P, India it is a tertiary care center. The duration of study was 1 year from April 2018- May 2019; 100 patients were included in the study. **Observation and results:** In our study we have taken samples from 100 patients, 65 patients (65%) had tubotympanic type while 35 patients (35%) had atticointral type of CSOM. Microbial growth was obtained in 85 (85%) samples, 15 had no growth (15%) being mono-microbial in 81 (81%) while mixed growth was obtained in 4 (4%) samples. *P. aeruginosa* (32.30%) and *S. aureus* was most common isolates in patients with tubotympanic CSOM. In atticointral type of CSOM most common isolates were *P. aeruginosa* (42.82%) followed by *S. aureus* Fungal positivity was observed in 06 (9.23%) cases of tubotympanic CSOM only.

Keywords: CSOM, Tubotympanic, Atticointral, Microbiological flora.

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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 atticointral[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 as atticointral 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 extra-cranial 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 and head & neck surgery, A.B.V Government Medical College, Vidisha, M.P, India it is a tertiary care center. The duration of study was 1 year from April 2018- May 2019; 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.

Exclusion criteria: 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

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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].

Observation and results: In our study we have taken samples from 100 patients, 65 patients (65%) had tubotympanic type while 35 patients (35%) had atticointral type of CSOM. Microbial growth was

obtained in 85 (85%) samples, 15 had no growth (15%) being mono-microbial in 81 (81%) while mixed growth was obtained in 4 (4%) samples. Among 65 patients of tubotympanic CSOM, the most common isolates were *P. aeruginosa* (32.30%) (**Picture: 1**) and *S. aureus* (29.23%) followed by *E. coli* (9.23%), *Proteus* (3.07%) and coagulase-negative Staphylococci (CONS) (1.53%). (**Table: 1**) No growth was observed in 09 (13.8%) samples. Among 35 patients of atticointral-type CSOM, the major isolate was *P. aeruginosa* (42.82%) followed by *S. aureus* (22.85%), CONS (5.71%), *Proteus mirabilis* (5.71%) and *E. coli* (2.85%). Fungal positivity was observed in 06 (9.23%) cases of tubotympanic CSOM only. No fungal growth was seen in atticointral disease. Anaerobes were isolated in 02 samples (2.85%), one each in tubotympanic (1.53%) and atticointral (2.85%) type of CSOM.



Fig 1: Pseudomonas aeruginosa growth seen on culture media.

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

S.No	Name of organism	Tubotympanic type	%	Attico-antral Type	%
1	Pseudomonas aeruginosa	21	32.30%	15	42.82%
2	Staphylococcus aureus	19	29.23%	08	22.85%
3	Candida spp	06	9.23%	00	00%
4	Klebsiella + Pseudomonas	03	4.61%	00	00%
5	E.Coli	02	3.07%	01	2.85%
6	Proteus spp	02	3.07%	02	5.71%
7	Klebsiella + CONS	01	1.53%	00	00%
8	Coagulase negative staphylococci	01	1.53%	02	5.71%
9	Anaerobes	01	1.53%	01	2.85%
10	No growth	09	13.8%	06	17.14%
	Total	65	100%	35	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 Mohit Srivastava Sushant Tyagi[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 Saranya SK et al found that majority of bacterial isolates were *Pseudomonas aeruginosa* (34.7%), followed by *Staphylococcus aureus* (18.7%), *Klebsiella aerogenes* (12%). Study conducted by Rajat Prakash et al 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 85 (85%) samples, 15 had no growth (15%) being

mono-microbial in 81 (81%) while mixed growth was obtained in 4 (4%) 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. In our study we have taken samples from 100 patients, 65 patients (65%) had tubotympanic type while 35 patients (35%) had atticointral type of CSOM. Microbial growth was obtained in 85 (85%) samples, 15 had no growth (15%) being mono-microbial in 81 (81%) while mixed growth was obtained in 4 (4%) samples. *P. aeruginosa* (32.30%) and *S. aureus* (29.23%) followed by *E. coli* (9.23%), *Proteus* (3.07%) and coagulase-negative

Staphylococci (CONS) (1.53%) was most common isolates in patients with tubotympanic CSOM. In atticointral type of CSOM most common isolates were *P. aeruginosa* (42.82%) followed by *S.aureus* (22.85%), CONS (5.71%), *Proteus mirabilis* (5.71%) and *E. coli* (2.85%). Fungal positivity was observed in 06 (9.23%) cases of tubotympanic CSOM only.

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