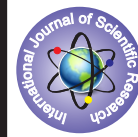


BACTERIOLOGICAL FLORA IN SAFE AND UNSAFE TYPES OF CHRONIC SUPPURATIVE OTITIS MEDIA.



ENT

KEYWORDS:

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INTRODUCTION.

Chronic Suppurative Otitis media is a chronic inflammation of the middle ear cleft characterized by ear discharge from a permanent perforation in the tympanic membrane. It has been classified into two types tubo-tympanic and attico-antral type depending upon whether the pars tensa is involved (former) or pars flaccida is involved (later). The perforations of pars tensa are again of two types – 1. Central and 2. Marginal. The Central tubo-tympanic perforations are considered as safe as they are usually not encountered with life threatening complications where as marginal perforations of pars tensa and attic perforations are considered as dangerous as they are often associated with life threatening complications. The disease is more common in developing countries especially among low socio-economic society because of malnutrition, overcrowding, poor hygiene, inadequate health care, and recurrent upper respiratory tract infection. The urban to rural ratio of the disease is 1:2 and the poorer rural communities have highest prevalence (1) With the advent of newer antibiotics the complication rates in Chronic Suppurative Otitis media (CSOM) has drastically come down but has lead to another problem due to indiscriminate use of antibiotics – that of multi-drug resistant bacterial strains and disease complications in return. Changes in bacterial flora in CSOM in the last decade have been confirmed and described by various authors. (2) Knowledge of the common causative organisms and their antibiotic sensitivity is helpful in deciding the drug of choice in peri operative management of both safe and unsafe types of CSOM.

MATERIAL AND METHOD

The study was undertaken at Mayo Institute of Medical Sciences, Gadia, Barabanki - a tertiary care center of UP after proper approval from the ethical committee of the college with an aim to study the bacterial flora and their sensitivity to a series of antibiotics in cases of both safe and unsafe CSOM. The study group included 150 patients of CSOM managed in outpatient and inpatient departments of the college from January 2015 to September 2016. The selection criteria included the following:

1. Diagnosed cases of CSOM – a permanent perforation were seen in all the cases using a microscope.
2. Patients were selected randomly and samples were taken from both discharging (all types of perforations – both safe and unsafe) and non discharging ears also to see for dormant bacteria in cases of dry CSOM.
3. All the patients underwent Audiometry (hearing test) test.
4. Patients with Otitis externa, Otorrhea were excluded from the study.
5. Samples were collected before giving topical or systemic antibiotics.
6. Aural swabs were collected from the ear (after cleaning external auditory canal with spirit swab) of the patients. Due care was taken to avoid contamination while collecting pus from ear. In cases with bilateral disease, ear swabs were taken separately from both the ears.
7. The swabs were processed for aerobic bacteria using standard microbiological procedures. All cases showing growth on culture media after 72 hours of inoculation were subjected to culture and sensitivity for the commonly used antibiotics. The study group was divided in three groups.

Group A: Patients suffering from CSOM with safe type of disease and a discharging ear. (n=50)

Group B: Patients suffering from CSOM with safe type of disease and a dry ear. (n=50)

Group C: Patients suffering from CSOM with unsafe type of disease (patients with both marginal and atticoantral disease were put in this category). (n=50)

	CHRONIC SUPPURATIVE OTITIS MEDIA.		
	Safe – wet. (n=50)	Safe – Dry. (n=50)	Unsafe. (n=50)
Staphylococcus aureus	12		10
Pseudomonas Aurigenosa	12		20
Enterococcus species	10		
Proteus	10		
Candida	3		
Serratia Marcesceus	2		
Diphtheroid Growth	1		
Mixed Growth	0		15
No Growth (sterile)	0	50/50	5

OBSERVATIONS (Fig 1)

In Group A patients no sterile specimens were reported, meaning that even with a mucoid discharge from the middle ear there are bacteria present in it, and we must consider presence of bacteria in every discharging ear. Both Staphylococcus aureus as well as Pseudomonas aeruginosa were the most common organisms isolated from the ear both accounting for 24% (n=12) each, Then Enterococcus and Proteus were second most common organisms isolated from the ear both accounting for 20% (n=10) each. Candida was seen in 6% (n=3) of patients and Serratia Marcesceus was seen in 4% (n=2) of patients. One patient (2%) had a diphtheroid growth in the discharge. Surprisingly mixed growth (flora) was not encountered in any sample of safe type of disease in our study.

In Group B patients the result of all the samples was sterile suggesting that in dry safe CSOM there are no active bacteria in the ear that could be cultured.

In Group C patients: Only two organisms were isolated from the discharge in unsafe type of CSOM. Pseudomonas aeruginosa was the most common organism accounting for 40% (n=20) of cases followed by mixed growth of Staphylococcus aureus and Pseudomonas aeruginosa accounting for 30% (n=15) of cases, whereas Staphylococcus aureus was seen in 20% (n=10) of cases. We found mixed flora only in group C patients. Surprisingly no other bacteria were isolated from the ear of patients suffering from unsafe CSOM.

DISCUSSION.

Chronic Suppurative Otitis Media (C.S.O.M.) is one of the commonest clinical entity encountered in ENT practice. Discharging ear along with varying degree of hearing impairment is one of the commonest complaints encountered in the disease. In the safe type of disease these are the common features but in the unsafe type it can lead to

serious complications which can be intra temporal like – vestibulitis, facial palsy, mastoiditis, mastoid abscess and intra temporal complications like meningitis and intracranial abscess hence it is important to recognize the bacteria present in the disease for proper antibiotic coverage and control of the disease. CSOM is an important cause of preventable hearing loss particularly in the developing world [3] and a reason of serious concern, particularly in children, because it may have long-term effects on early communication, language development, auditory processing, educational process, and physiological and cognitive development. [4] The present series analysis the bacteriological profile in safe (dry as well as discharging) as well as unsafe type of Chronic Suppurative Otitis Media.

Not many papers have so far been published found by the author that differentiates between the bacteriological florae of the two types of Chronic Suppurative Otitis Media hence this study holds relevance. A study conducted by Mohit Srivastava Sushant Tyagi (5) suggested - Predominant bacterial etiology of CSOM was *Pseudomonas aeruginosa* seen in 40.65% of the cases followed by *Staphylococcus aureus* (14.63%) and *Klebsiella aerogenes* (11.78%). *Pseudomonas*, is the predominant cause of CSOM in tropical region does not usually inhabit the upper respiratory tract, its presence in the middle-ear cannot be ascribed to an invasion through ET and it should be considered as secondary invader gaining access to the middle-ear via defect in TM. [6] *Proteus mirabilis* was seen in 10.56% of the cases and *Escherichia coli* were isolated from 8.94% cases.

Where as in the present series in safe type both *Staphylococcus aureus* and *Pseudomonas* was seen in equal number of patients but in unsafe CSOM *Pseudomonas* was the most common bacteria found followed by mixed growth. The incidence of proteus infection in the present study was twice as much (20%) as in their study in the safe type of disease, and it was not isolated from unsafe disease. *E. coli* was not encountered in any case in the present study.

PRAKASH M et al (7) also did a similar study on eighty patients with symptoms of CSOM, and he also did not classify the disease in safe and dangerous types. In his study predominant organism isolated was *Staphylococcus aureus* (41.25%) followed by *Pseudomonas* sp. (37.5%), whereas in our study (if we take N=100 excluding the dry perforations) the predominant organism isolated is *Pseudomonas* (32%) followed by *Staphylococcus aureus* (22%). The percentage of both in our study is much lesser. Although in both the studies these two were the most common organisms isolated from a discharging ear in CSOM. Shyamala et al [17] also has found that these two were the predominant organisms isolated from the otitis media. Mon microbial growth was seen in 85% of his cases, which is similar to the study by Agarwal et al [9] and was also the case in our study.

Study conducted by Saranya SK et al (8) showed that majority of bacterial isolates were *Pseudomonas aeruginosa* (34.7%), followed by *Staphylococcus aureus* (18.7%), *Klebsiella aerogenes* (12%), *Proteus mirabilis* (9.3%), *Escherichia coli* (8%), Non fermenting Gram negative bacilli (5.3%) and *Klebsiella oxytoca* (1.3%), which is similar to our study except that in our study *Klebsiella* was not isolated in any case.

Another study conducted by Sanjay Kumar et al (9) was only for organisms in unsafe type of CSOM. In his study in 5.72% cases showed sterile culture where as in our study this incidence was 10%. In his study 90.90% patients had a mono microbial growth; where as in our series only in 70% cases we had a mono microbial growth, and as many as 30% cases showed a mixed bacteriological growth in unsafe CSOM. In his study the common organisms isolated in descending order were: *Pseudomonas*, *Klebsiella*, *Staphylococcus*, *Proteus*, and *Escherichia coli*, where as in our study only *Pseudomonas* and *Staphylococcus* were isolated. In his study cases with ear swab showing poly-microbial growth *Pseudomonas*, *Staphylococcus*, and *Klebsiella* were commonly associated, whereas in our study only *Pseudomonas* and *Staphylococcus* were seen.

Study conducted by Rajat Prakash et al (10) showed mono-microbial growth was obtained in 57.84% and 33.33% samples yielded poly-microbial growth, whereas, 8.82% samples showed no growth, whereas in our study mono-microbial growth was obtained in 85%, poly-microbial growth in 15% and sterile culture was seen in 5% cases. In his study predominant bacterial etiology of CSOM was *Staphylococcus aureus* (48.69%) the incidence of which in our study was only 22%, whereas *Pseudomonas* was isolated in 19.89% of cases the incidence of which in our series was 32%. Coliforms including *Klebsiella pneumoniae* and *Escherichia coli* were isolated from 9.42% and 7.33% cases respectively, both of which were not isolated in our study.

CONCLUSION.

1. Chronic Suppurative Otitis media like any other chronic illness is associated with high morbidity and in some unsafe types can be fatal as well and must be treated with priority.
2. Lack of awareness towards disease adds to the morbidity and mortality.
3. Lack of proper healthcare availability especially in rural areas also adds to the morbidity and mortality.
4. Improper or inability to isolate the infested organism is a major reason of failure of conservative treatment.
5. The constant changing nature of bacteriological flora adds to the problem hence a periodic analysis of the flora is necessary for proper treatment.
6. Indiscriminate use of antibiotics especially without knowing the sensitivity adds to the problem of drug resistance.
7. Since disease is more common in children educating the parents is an important criterion in reducing the disease occurrence as well as reducing the complications associated with it.
8. We recommend that a continuous bacteriological evaluation and proper isolation along with sensitivity before treating these patients is very important for the management of the disease.
9. We hope that the data in our study will help understand the bacteriological flora in both safe and unsafe type of Chronic Suppurative Otitis media, as not many studies were found to have done that.

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