

## ORIGINAL ARTICLE

## Pattern of Bacterial Isolates from Chronic Suppurative Otitis Media Patients- A Microbiological Study

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### ABSTRACT:

**Introduction-** Chronic Suppurative Otitis Media (CSOM) is defined as chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharges or otorrhea through a tympanic perforation. This study was conducted to assess aerobic bacterial distribution in CSOM isolates. **Materials & Methods-** The present study was conducted on 380 patients with CSOM. Aural swabs were taken from the draining ears by using a sterile swab stick before any local medication. Two sterile swabs properly labeled for each patient, were used to collect the specimen and then promptly transported to the microbiology laboratory. **Results-** Age group 1-10 years had 27 males and 29 females, 11-20 years had 40 males and 30 females, 21-30 years had 56 males and 45 females, 31-40 years had 34 males and 24 females, 41-50 years had 28 males and 21 females, 51-60 years had 20 males and 15 females, 61-70 years had 5 males and 6 females. The difference was non-significant (P= 0.1). 21% samples were sterile, 5% were diptheroids, 24% were gram positive cocci which include 10.8% staphylococcus aureus, 8.7% coagulase negative Staphylococci and 4.5% Streptococci. Gram negative bacilli constitute 48% which includes 12% Pseudomonas spp., 24% Escherichia coli, 8% Proteus spp. and 4% Klebsiella spp. 2% were mixed infections which includes 0.8% Klebsiella spp.+ Pseudomonas spp., 1% E.coli + Pseudomonas spp. and 0.2% Klebsiella spp. + Proteus spp. The difference was significant (P= 0.01). **Conclusion-** CSOM is a common disease amongst young population. Maximum number of patients was seen in age group 21-30 years. Male predominance was observed. Commonly found bacterial isolates was gram negative bacilli and gram positive cocci. **Key words-** Bacteria, Escherichia coli, Pseudomonas.

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### INTRODUCTION

The most common middle ear infection is Otitis media. It is one of the inflammatory diseases. There are two main types, acute suppurative otitis media (AOM) and chronic suppurative otitis media. Chronic Suppurative Otitis Media (CSOM) is defined as chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharges or otorrhea through a tympanic perforation. It may be a complication of acute otitis media. Pain is rarely present. There can be hearing impairment (HI), which may result in delays in speech, language, and cognitive skills development, especially if commencing prelingually and leading to decreased employability in adulthood.<sup>1</sup>

The majority of those affected reside in low income countries. This prevalence is far higher than the threshold used by the World Health Organization to qualify as a public health problem. There is a varying prevalence of CSOM among African countries, ranging from 0.4% to 4.2%. Risk factors includes multiple episodes of acute otitis media (AOM), living in crowded conditions, being a member of a large family, attending daycare, studies of parental education, passive smoking, breastfeeding, socio-economic status and the annual number of upper respiratory tract infections (URTIs) show inconclusive associations only, craniofacial abnormalities increase risk: cleft lip or palate, choanal atresia and microcephaly.<sup>2</sup>

Antibiotics should have activity against Gram-negative organisms, particularly pseudomonas and Gram-positive organisms, especially Staphylococcus aureus, aminoglycosides and the flouroquinolones both meet these criteria but there remain safety concerns with both. Many authorities advise that topical aminoglycosides should not be used with tympanic perforation, due to their ototoxicity. However, many specialists continue to use them carefully, considering that undertreated OM carries a higher risk of hearing impairment and complications. The recurrent nature and the development of drug resistant pathogenic organisms, poses a great challenge in infection.<sup>3</sup> This study was conducted to assess aerobic bacterial distribution in CSOM isolates.

### MATERIALS & METHODS

The present study was conducted in the department of microbiology. It included 380 patients with CSOM patients of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

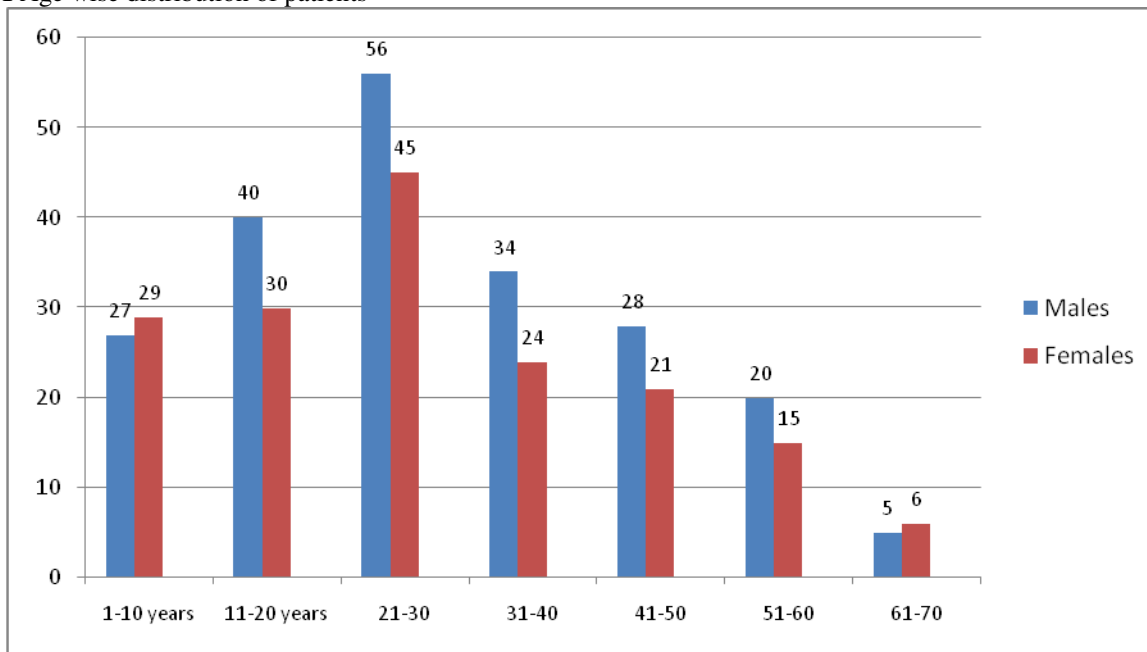
General information such as name, age, gender etc. was recorded. Aural swabs were taken from the draining ears by using a sterile swab stick before any local medication. Two sterile swabs properly labeled for each patient, were used to collect the specimen and then promptly transported to the

microbiology laboratory. With one swab, Gram’s stain of direct smear was performed. The other swab was inoculated on Blood and Macconkey agar, incubated aerobically at 37°C overnight and bacteria were identified using morphological, cultural and biochemical

characteristics. Culture for anaerobes was not performed in this study. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Graph I** Age wise distribution of patients



Graph I shows that age group 1-10 years had 27 males and 29 females, 11-20 years had 40 males and 30 females, 21-30 years had 56 males and 45 females, 31-40 years had 34 males and 24 females, 41-50 years had 28 males and 21 females, 51-60 years had 20 males and 15 females, 61 70 years had 5 males and 6 females. The difference was non- significant (P- 0.1).

**Table II** Aerobic Bacterial distribution in CSOM isolates

Bacterial species	Number	P value
<b>Sterile</b>	21%	0.01
<b>Diphtheroids</b>	5%	
<b>Gram positive cocci</b>	24%	
<b>Staphylococcus aureus</b>	10.8%	
<b>Coagulase negative Staphylococci</b>	8.7%	
<b>Streptococci</b>	4.5%	
<b>Gram negative bacilli</b>	48%	
<b>Pseudomonas spp.</b>	12%	
<b>Escherichia coli</b>	24%	
<b>Proteus spp.</b>	8%	
<b>Klebsiella spp.</b>	4%	
<b>Mixed infection</b>	2%	
<b>Klebsiella spp.+ Pseudomonas spp.</b>	0.8%	
<b>E.coli + Pseudomonas spp.</b>	1%	
<b>Klebsiella spp. + Proteus spp.</b>	0.2%	

Table II shows that 21% samples were sterile, 5% was diphtheroids, 24% were gram positive cocci which includes 10.8% staphylococcus aureus, 8.7% coagulase negative Staphylococci and 4.5% Streptococci. Gram negative bacilli constitute 48% which includes 12% Pseudomonas spp., 24% Escherichia coli, 8% Proteus spp. and 4% Klebsiella spp. 2% were mixed infections which includes 0.8% Klebsiella spp.+ Pseudomonas spp., 1% E.coli + Pseudomonas spp. and 0.2% Klebsiella spp. + Proteus spp. The difference was significant (P- 0.01).

## DISCUSSION

CSOM is also called chronic active mucosal otitis media, chronic oto-mastoiditis, and chronic tympanomastoiditis. A subset of CSOM may have cholesteatomas or other suppurative complications. The non-CSOM group includes such entities as chronic non-suppurative otitis media, chronic otitis media with effusion (COME), chronic secretory otitis media, chronic seromucous otitis media, chronic middle ear catarrh, chronic serous otitis media, chronic mucoid otitis media, otitis media with persistent effusions, and glue ear. All these are recurrent or persistent effusions in the middle ear behind an intact tympanic membrane in which the principal symptom, if present at all, is deafness and not ear discharge.<sup>4</sup>

In our study, out of 380 patients, age group 1-10 years had 27 males and 29 females, 11-20 years had 40 males and 30 females, 21-30 years had 56 males and 45 females, 31-40 years had 34 males and 24 females, 41-50 years had 28 males and 21 females, 51-60 years had 20 males and 15 females, 61-70 years had 5 males and 6 females. This is in agreement with Mackie et al.<sup>5</sup>

If there is postauricular swelling or tenderness, facial paralysis, vertigo or evidence of intracranial infection, arrange urgent assessment or admission with an ENT team. Refer cases of CSOM without these features for routine ENT assessment. An ENT specialist will be able to microsuction the exudate from the ear canal and hence visualize the tympanic membrane accurately. Current guidance from the National Institute for Health and Care Excellence Clinical Knowledge Summaries suggests that GPs should not initiate treatment - this is because few non-specialists have the equipment or training to carry out aural cleaning; additionally, the topical antibiotics used by specialists are either used off-licence (quinolones) or are not recommended in the presence of tympanic perforation (aminoglycosides). Patients should be advised to keep the affected ear dry.<sup>6</sup>

We found that 21% samples were sterile, 5% was diptheroids, 24% were gram positive cocci, gram negative bacilli constitute 48% and 2% were mixed infections. This is similar to Panchal et al.<sup>7</sup> The choice of antimicrobial treatment to be combined with aural toilet is a highly contentious issue. A 1985 survey of paediatricians in Dallas, Texas (USA), found that 79% would prescribe topical antibiotics and 100% would use oral antibiotics as well. A consensus of management formed by 141 physicians with expertise and interest in middle ear infections yielded the following recommended treatment: suction out and culture the discharge, prescribe oral antibiotics, and adjust according to sensitivity results. A study by Garima et al<sup>8</sup> found that the commonest

pathogens isolated were *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella* spp., *Escherichia coli*, Coagulase Negative Staphylococci (CONS) and other gram negative rods.

The superiority of aural toilet with topical antibiotic treatment implies a change in the current management of CSOM. Ear wicking alone, as advocated by the WHO guidelines for the Integrated Management of Childhood Illness, is not sufficient. In cases where the nature of the otorrhoea is unclear or where antimicrobial treatment is not feasible, aural toilet alone would tend to reduce the odds of otorrhoea from 0.80 to 0.74.<sup>9</sup>

## CONCLUSION

CSOM is a common disease amongst young population. Maximum number of patients was seen in age group 21-30 years. Male predominance was observed. Commonly found bacterial isolates was gram negative bacilli and gram positive cocci.

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