

## Bacteriology Evaluation among Patients with Chronic Suppurative Otitis Media: A Hospital Based Study

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### ABSTRACT

**Introduction:** Chronic Suppurative Otitis Media (CSOM) is defined as chronic inflammation of the middle ear and mastoid cavity. The present study was conducted to assess bacteriology of patients with Chronic Suppurative Otitis Media.

**Materials & Methods:** The present study was conducted on 180 patients with CSOM. 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 8 males and 3 females, 11-20 years had 30 males and 15 females, 21-30 years had 26 males and 12 females, 31-40 years had 22 males and 8 females, 41-50 years had 14 males and 20 females, 51-60 years had 10 males and 12 females. The difference was non-significant (P- 0.01). 22% samples were sterile, 6% was diptheroids, 22% were gram positive cocci which includes 9% staphylococcus aureus, 7% coagulase negative Staphylococci and 6% Streptococci. Gram negative bacilli constitute 44% which includes 14% Pseudomonas spp., 22% Escherichia coli, 8% Proteus spp. 6% were mixed infections which includes 6.8 % Klebsiella spp. + Pseudomonas spp., 1.2 % E.coli +

Pseudomonas spp. and 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 11-20 years. Commonly found bacterial isolates was gram negative bacilli and gram positive cocci.

**Key words:** Bacteria, Chronic Suppurative Otitis Media, E. coli.


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### Article History:

Received: 04-03-2018, Revised: 21-03-2018, Accepted: 02-04-2018

### Access this article online

Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2018.4.3.049	

### 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. The WHO defines CSOM as "otorrhea through a perforated tympanic membrane present for at least two weeks." CSOM can occur when acute otitis media (AOM) causes acute perforation of the tympanic membrane or when AOM occurs in conjunction with chronic perforation or tympanostomy tubes. The most common sequelae of CSOM are conductive or sensorineural hearing loss. 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>

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>

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> The present study was conducted to assess bacteriology of patients with Chronic Suppurative Otitis Media.

### MATERIALS & METHODS

The present study was conducted in the department of Microbiology of Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India. It included 180 patients with CSOM patients. 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. 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**

Table I shows that age group 1-10 years had 8 males and 3 females, 11-20 years had 30 males and 15 females, 21-30 years had 26 males and 12 females, 31-40 years had 22 males and 8 females, 41-50 years had 14 males and 20 females, 51-60 years had 10 males and 12 females. The difference was non-significant (P- 0.01).

Table II shows that 22% samples were sterile, 6% was diptheroids, 22% were gram positive cocci which includes 9% staphylococcus aureus, 7% coagulase negative Staphylococci and 6% Streptococci. Gram negative bacilli constitute 44% which includes 14% Pseudomonas spp., 22% Escherichia coli, 8% Proteus spp. 6% were mixed infections which includes 6.8% Klebsiella spp.+ Pseudomonas spp., 1.2% E.coli + Pseudomonas spp. and 2% Klebsiella spp. + Proteus spp. The difference was significant (P- 0.01).

**Table I: Age wise distribution of patients**

Age groups (years)	Males	Females	P value
1-10	8	3	
11-20	30	15	0.01
21-30	26	12	
31-40	22	8	
41-50	14	20	
51-60	10	12	
<b>Total</b>	110	70	

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

Bacterial species	Number	P value
<b>Sterile</b>	22%	
<b>Diptheroids</b>	6%	
<b>Gram positive cocci</b>	22%	
Staphylococcus aureus	9%	
Coagulase negative Staphylococci	7%	
Streptococci	6%	0.01
<b>Gram negative bacilli</b>	44%	
Pseudomonas spp.	14%	
Escherichia coli	22%	
Proteus spp.	8%	
<b>Mixed infection</b>	6%	
Klebsiella spp.+ Pseudomonas spp.	6.8%	
E.coli + Pseudomonas spp.	1.2%	
Klebsiella spp. + Proteus spp.	2%	

**DISCUSSION**

Since CSOM can cause significant morbidity, knowledge of the pathogens responsible for CSOM can assist in the selection of the most appropriate treatment regimen. CSOM is usually classified into two types, tubotympanic and attico-antral depending on whether the disease process affects the pars tensa or pars flaccida of the tympanic membrane (TM). Tubotympanic is called as a safe type or benign type as there is no serious complication whereas, attico-antral is called as the unsafe or dangerous type because of associated complication and may be life threatening at times.<sup>4</sup> Infection can spread from middle-ear to vital structures such as mastoid, facial nerve, labyrinth, lateral sinus, meninges and brain leading to mastoid abscess, facial nerve, paralysis, deafness, lateral sinus thrombosis, meningitis and intracranial abscess.

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.<sup>5</sup>

In our study, out of 180 patients, age group 1-10 years had 8 males and 3 females, 11-20 years had 30 males and 15 females, 21-30 years had 26 males and 12 females, 31-40 years had 22 males and 8 females, 41-50 years had 14 males and 20 females, 51-60 years had 10 males and 12 females. This is in agreement with Rishabh et al.<sup>6</sup>

An ENT specialist will be able to microsuction the exudate from the ear canal and hence visualize the tympanic membrane accurately. 22% samples were sterile, 6% was diptheroids, 22% were gram positive cocci. Gram negative bacilli constitute 44%, 6% were mixed infections. This is similar to Parul 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.<sup>9</sup>

**CONCLUSION**

Maximum number of patients was seen in age group 11-20 years. Commonly found bacterial isolates was gram negative bacilli and gram positive cocci. Male predominance was seen as compared to females.

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**Source of Support:** Nil.

**Conflict of Interest:** None Declared.

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**Cite this article as:** Maya Barala. Bacteriology Evaluation among Patients with Chronic Suppurative Otitis Media: A Hospital Based Study. *Int J Med Res Prof.* 2018 May; 4(3):235-37.

DOI:10.21276/ijmrp.2018.4.3.049