

## ISOLATION OF MICROFLORA INVOLVED IN CHRONIC SUPPURATIVE OTITIS MEDIA AND FINDING ANTIBIOTIC SENSITIVITY IN KHARIAN

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### ABSTRACT

**Objective:** The objective of the study is to find out the microorganisms implicated in chronic suppurative otitis media (CSOM) and to know the sensitivity pattern of these microorganisms to commonly used antibiotics in Kharian.

**Study Design:** Cross-sectional descriptive study.

**Place and Duration of Study:** The study was conducted in Combined Military Hospital (CMH) Kharian from January 2013 to Dec 2013.

**Patients and Methods:** One hundred and twenty (120) cases of clinically diagnosed CSOM were included in this study. Ear swabs were taken using commercially available sterile swab sticks and the samples were sent to the pathology lab under strict aseptic conditions to culture the microorganisms and find sensitivity pattern.

**Results:** Out of 120 cases included in the study, there were 56 (47%) females and 64 (53%) males with slight male dominance. The patients' age range was from 2 years to 63 years. Highest frequency was of *Pseudomonas aeruginosa* found in 51 (42.5%) cases followed by *Staphylococcus aureus* in 28 (23.4 %) cases, MRSA (Methicillin Resistant *Staphylococcus aureus*) in 7(5.8%) cases, *Proteus* in 6 (9.2%) cases, *Klebsiella* in 8 (6.7%) cases and *E-Coli* in 6 (5%) case. *Pseudomonas aeruginosa* was highly sensitive to Ciprofloxacin, Amikacin and Sulbactam-cefoperazone. *Staphylococcus aureus* had high sensitivity to Amoxi-clav, Amikacin etc. MRSA (Methicillin Resistant *Staphylococcus aureus*) was 100% sensitive to Vancomycin.

**Conclusion:** *Pseudomonas aeruginosa* and *Staphylococci* are the commonest organisms involved in CSOM and they show good sensitivity to the fluoroquinolones and aminoglycosides which are available in local preparations. The knowledge of microbiological flora and its sensitivity to commonly used antibiotics is important for rationale use of the antibiotics and to avoid development of resistance.

**Keywords:** Antibiotic sensitivity, Chronic suppurative otitis media, Methicillin resistant *Staphylococcus aureus* (MRSA).

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### INTRODUCTION

Chronic suppurative otitis media (CSOM) is one of the common diseases in the community. It is defined as persistent or intermittent pus discharge through a chronic tympanic membrane perforation. The perforation is deemed to be chronic if present for more than three months. Most of the time, chronic suppurative otitis media develops as a result of acute otitis media causing perforation of the tympanic membrane which does not heal resulting in persistence of

perforation. Previously (CSOM) was classically divided into two varieties i.e. tubotympanic and atticoantral. Tubotympanic chronic otitis media is also called safe type, it affects the anteroinferior part of tympanic membrane. Atticoantral type is termed unsafe type and in this variety there is posterosuperior defect of the tympanic membrane and is also often associated with cholesteatoma which is a bone eroding process. Cholesteatoma is dangerous as it may cause various life threatening complications like extradural abscess, subdural abscess, dural sinus thrombosis and meningitis. Recently chronic suppurative otitis media has been classified into the following types; active mucosal, inactive

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mucosal, active squamous, inactive squamous and healed (dimeric, tympanosclerosis etc).

The prevalence of CSOM has been quite extensively studied. According to World Health Organization (WHO) prevalence of CSOM in South East Asia is 1.4%<sup>1</sup>. The prevalence varies a lot among different regions and countries. Prevalence rate of 1-2% has been recognized as low and 3-6% as high prevalence rates of chronic otitis media by WHO<sup>2</sup>. The commonly isolated bacteria in the culture of pus in cases of chronic otitis media include *Pseudomona aeruginosa*, *Staphylococcus aureus*, *Proteus*, *Klebsiella*. Anaerobes and fungi are also less commonly

## PATIENTS AND METHODS

This cross sectional descriptive study was carried out in Combined Military Hospital (CMH) Kharian from January 2013 to December 2013. Study population was all the serving and retired army personnel alongwith their families and civilians not entitled patients who reported to the hospital. Clinically diagnosed cases of CSOM i.e. pus discharge of at least more than 6 weeks duration (intermittent or persistent) through a chronic perforation of tympanic membrane and patients with active discharge or pus in external auditory meatus were included in the study. While any immunocompromised

**Table-1: Sensitivity of microorganism to common antibiotics.**

Antibiotics	<i>Pseudomona aeruginosa</i>	<i>Staphylococcus aureus</i>	MRSA	<i>Proteus</i>	<i>Klebsiella</i>	<i>E. coli</i>
Amoxycillin	-	0%	0%	-	-	-
Co-trimoxizole	-	17.2%	0%	-	-	-
Gentamycin	65.5%	78.6%	-	66.7%	43.5%	65%
Ciprofloxacin	93.8%	85.7%	10%	83.3%	56%	43.5%
Doxycycline	-	63.75	10%	10%	43.5%	16.6%
Amikacin	93.8%	88.5%	60%	100%	100%	100%
Amoxi-clav	-	92.3%	-	43.5%	-	-
Sulbectum-cefoperazone	93.8%	-	-	100%	92.5%	100%
Vancomycin	-	100%	100%	-	-	-

involved. There are different studies, in few *Pseudomonas* was the most common isolated microorganism involved while in others *Staphylococcus* was the most common<sup>3</sup>.

The choice of antibiotics for chronic otitis media depends upon their efficacy, safety, availability and cost. Local antibiotic preparations in the form of drops are the mainstay of treatment and also cost effective, but owing to the emerging resistance it is important to review and revise the microbiological profile of implicated organisms and finding their efficacy. The purpose of this study was to isolate the commonly involved microorganisms in CSOM and to also to check the antibiotic sensitivity and resistance in the region.

patient, patients having history of any recent surgery of ear or mastoid, or use of topical or oral antibiotics during previous 15 days, were excluded from the study.

One hundred and twenty clinically diagnosed CSOM patients were selected by ENT specialists in the outpatient department. The cases belonged to all age groups and both genders. All the cases i.e selected patients consented for the subject research. Ethical committee certificate was obtained. Ear swabs were taken using commercially available sterile swab sticks and the samples were immediately sent to the pathology laboratory of CMH Kharian under strict aseptic conditions to culture the microorganism and find its sensitivity pattern. All the patients were followed up fortnightly

alongwith culture sensitivity reports. In cases of resistant strains (where culture sensitivity report dictated) the treatments were changed accordingly. The data thus collected was analyzed with the help of statistical package for social sciences (SPSS) version 16.

## RESULTS

Total 120 cases were included in the study; there were 56 (47%) females and 64 (53%) males with slight male dominance. The patient's age range was from 2 years to 63 years. Most of the patients were in age range of 2 to 7 years.

Distribution of microorganism cultured is

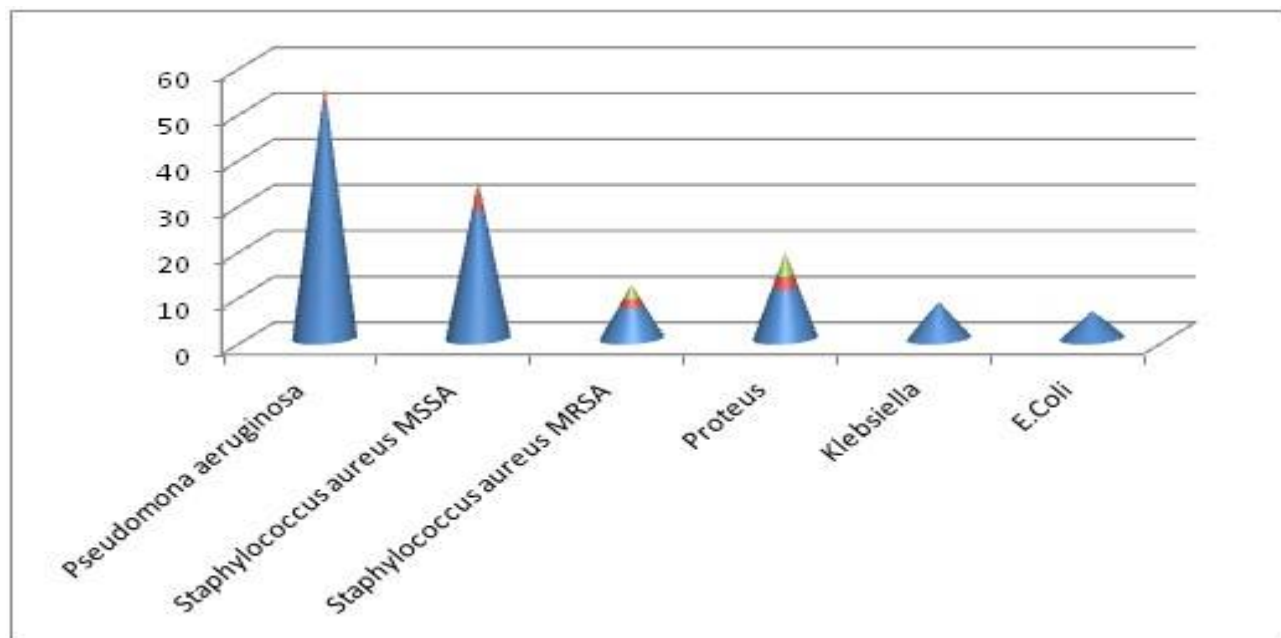


Figure: Description of microorganisms among patients (n=120).

described in fig. Most frequent organism cultured was *Pseudomonas aeruginosa* found in 51 (42.5%) cases followed by *Staphylococcus aureus* in 28 (23.4 %) cases, MRSA (Methicillin Resistant *Staphylococcus aureus*) in 7(5.8%) cases, *Proteus* in 6 (9.2%) cases, *Klebsiella* in 8 (6.7%) cases and *E-Coli* in 6 (5%) case. No organism was cultured in 9 (7.5%) cases. *Pseudomonas aeruginosa* was highly sensitive to Ciprofloxacin, Amikacin and Sulbactum-cefoperazone. *Staphylococcus aureus* had high sensitivity to Amoxi-clav, Amikacin etc. MRSA (Methicillin Resistant *Staphylococcus*

*aureus*) was 100% sensitive to Vancomycin. *Proteus* spp was completely sensitive to Amikacin and Sulbactum-cefoperazone that is 100% and 83.3% sensitive to ciprofloxacin. *Klebsiella* was again 100% sensitive to Amikacin. *E.coli* was also cent percent sensitive to Amikacin and Sulbactum-cefoperazone (table-1).

## DISCUSSION

CSOM is quite common in the developing countries. It is more prevalent in the poor socioeconomic environments and rural areas<sup>4</sup>. The highest rate of perforation of tympanic membrane and subsequent CSOM is seen in 2 to 4 years age range and it is roughly seen three

times more common than in adults. The most frequent microorganism found in this study is *Pseudomonas aeruginosa* which is seen in 42.5% of the cases, followed by *Staphylococcus aureus* seen in 23.4% of cases. *Pseudomonas aeruginosa* is the most frequent microorganism as shown in many studies<sup>5,6</sup>. Sharma et al carried out a study and they reported *Pseudomonas aeruginosa* to be found in 36% of cases followed by *Staphylococcus aureus* in 30 % of cases<sup>7</sup>. However *Staphylococcus aureus* was shown to be the commonest microorganism in many studies<sup>8,9</sup>. MRSA (Methicillin Resistant

*Staphylococcus aureus*) was seen 7(5.8%) cases which is similar to that shown in study of Iqbal et al<sup>10</sup>. These MRSA cases were community acquired as were outdoor cases.

Sensitivity of *Pseudomonas aeruginosa* to Ciprofloxacin, Amikacin and Sulbactam-cefoperazone was found to be high i.e 93.8%. It was followed by sensitivity to Gentamycin which was 65%. These findings correlate with the work of Mozafari et al, in their study the sensitivity of *Pseudomonas aeruginosa* to Ciprofloxacin was 95% and to Gentamycin was 85%<sup>11</sup>. *Staphylococcus aureus* had good sensitivity to amoxi-clav and Amikacin and was 100% sensitive to vancomycin. Vancomycin was shown to be 100% sensitive for MRSA (Methicillin Resistant *Staphylococcus aureus*) cases. *Proteus* spp was completely sensitive to Amikacin and Sulbactam-cefoperazone that is 100% and 83.3% sensitive to ciprofloxacin. *Klebsiella* was again 100% sensitive to Amikacin. *E.coli* was also cent percent sensitive to Amikacin and Sulbactam-cefoperazone (table-1).

CSOM is common disease which general physicians come across almost daily. Requisite knowledge of the involved microbiological flora and their sensitivity pattern is mandatory for adequate treatment.

## CONCLUSION

*Pseudomonas aeruginosa* and *Staphylococci* are the commonest organisms involved in CSOM and they show good sensitivity to the fluoroquinolones and aminoglycosides which are available in local preparations. The knowledge of

microbiological flora and its sensitivity to commonly used antibiotics is of utmost importance for rationale use of the antibiotics and to avoid development of resistance.

## CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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