



METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) AS AN EMERGING PATHOGEN IN CHRONIC SUPPURATIVE OTITIS MEDIA (CSOM)

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ABSTRACT

Background: CSOM is a middle ear cleft inflammatory condition, characterized by its persistent/recurrent discharge. CSOM is a destructive type of disease, if untreated can lead to irreversible & irreparable sequelae with life threatening complications.

Objectives: To study the prevalence & antibiogram of MRSA in CSOM patients.

Material and methods: A total of 90 cases of CSOM which fulfilled the inclusion criteria were included in the study. And all the isolates were processed & identified followed by testing for antibiogram pattern according to standard guidelines. Cefoxitin disc diffusion method was used to detect the Methicillin resistant isolates among the C.

Results: Of the 90 CSOM cases, 33.33% Staphylococcus aureus were isolated of whom 56.66% were MRSA and 43.3% were MSSA. Both MRSA and MSSA showed maximum sensitivity to Linezolid & least to Penicillin.

Conclusion: Continuous & periodic microbiological evaluation of CSOM causative organisms is essential in all health care center's to prevent the spread of resistant strains & also to have a proper protocol for the start of empirical therapy.

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INTRODUCTION

Otitis media is an inflammation of the middle ear cleft without reference to any etiological agent or specific pathogenesis.^{1,2} Otitis media is classified into acute, sub-acute & chronic.³ Acute & sub-acute otitis media are less destructive form with reversible sequelae & relatively have less complications compared to chronic otitis media which is a destructive disease with irreversible sequelae & have serious complications. Complications caused by CSOM range from painless discharge to life threatening intracranial or extra cranial complications. CSOM is defined as a chronic inflammation of the middle ear & mastoid cavity with recurrent ear discharge/otorrhea through perforated tympanic membrane.^{4,5} CSOM is more common in childhood, with peak around 2yrs of age^{4,5,6} & one of the major causes of deafness especially in developing countries like India.^{7,8} Anatomically the Eustachian tube in children is ore horizontal & short which is the cause for increased incidence in CSOM in them due to easy path for microorganisms to enter the middle ear through the nasopharynx.

Since the discovery of new antibiotics in the field of treatment, complications have significantly reduced. But has led to resistance to the commonly used antibiotic drugs due to inappropriate & indiscriminate use of broad spectrum higher

antibiotics, resulting in return of complications. The most common organisms responsible for CSOM are P.aeruginosa followed by S.aureus.^{9,10,11} But few other studies have reported S.aureus being the most common followed by P.aeruginosa.^{12,13,14,15} This variation in study results is due to change in climatic conditions, patient population & use of antibiotics before sample collection.

At the PHC's were facilities for culture & sensitivity testing are not available, clinicians start the patients with CSOM on empirical treatment, but since these organisms are developing resistance to commonly used antibiotics- this has resulted in treatment failure followed by complications.

Thus identification & detection of MRSA producers is very important before the start of CSOM treatment. So this study was undertaken in our tertiary center to study the sensitivity pattern of MRSA isolates from CSOM patients.

MATERIAL AND METHODS

The study was conducted on all the IPD and OPD patients attending the Department of ENT, DR. Prabhakar Kore's Charitable Hospital & MRC, Belgaum over a period of one year. Detailed clinical history regarding patient's age, sex, duration of ear discharge & antibiotic treatment was taken. Those patients who had not received antibiotic therapy for previous 5 days were excluded from the study. With all aseptic precautions sample was collected using sterile swabs & processed only for aerobic bacteria. All the organisms isolated

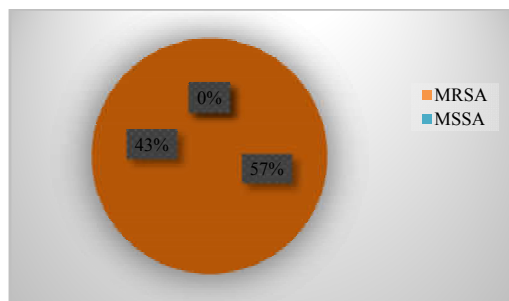
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were identified by their morphology, culture characters & biochemical reactions following standard protocols at the Department of Microbiology, Jawaharlal Nehru Medical College, KLE Academy of Higher Education and Research.¹⁶ All the isolates of S.aureus were screened for oxacillin sensitivity using cefoxitin disc (30 microgram disc) & antibiotic sensitivity testing was done by Kirby Bauer Disk Diffusion method & results were interpreted according to CLSI guidelines.

RESULTS

A total of 90 cases of CSOM were enrolled in the study, of which 30 (33.33%) were S.aureus. Of the 30 isolates of S.aureus, 17(56.66%) were MRSA and 13(43.33%) were MSSA (as shown in graph 1). Antibiotic sensitivity pattern of MRSA & MSSA are depicted in table 1. MRSA isolates showed maximum sensitivity to linezolid followed by Gentamycin & cotrimoxazole and least sensitivity to penicillin. MSSA isolates showed maximum sensitivity to linezolid and Chloramphenicol and least sensitivity to penicillin.



Graph 1 Showing the distribution of MRSA & MSSA

Table 1 showing the sensitivity pattern of MRSA & MSSA.

Sl.no	Antibiotics	Sensitivity % of MRSA	Sensitivity % of MSSA
1	Ampicillin	52.9%	61.5%
2	Amoxyclav	35.29%	30.7%
3	Cotrimoxazole	70.5%	76.9%
4	Clindamycin	64.70%	84.6%
5	Erythromycin	52.9%	46.15%
6	Gentamycin	70.5%	92.3%
7	Linezolid	94.11%	92.3%
8	Penicillin	11.76%	0%
9	Vancomycin	35.29%	69.23%
10	Tetracycline	64.7%	76.9%
11	Chloramphenicol	70.58%	84.6%
12	Doxycycline	41.17%	46.15%

DISCUSSION

Among the chronic infections, CSOM is the most common disease occurring worldwide. Its importance is due to the morbidity conditions it results in. In our study S.aureus were a total of 33.33% of isolates & the finding were similar to the study done by Rangaiah ST *et al.*, S. Nandan *et al.*, Patigaroo SA *et al.*, and Archana BR *et al.*,^{17,18,19 20} In our study MRSA in CSOM was seen in 56.66% & MSSA in 43.33% which is quite high compared to the study finding of Park *et al.*, who found the prevalence of MRSA in CSOM to be 4.9% only²¹ & also in a study done by Archana & Sree Harsha showed 5% prevalence of MRSA.²⁰ But a study done by Patigaroo *et al.*, showed 30% MRSA in CSOM.¹⁹

This alarming high percentage of MRSA & MSSA in CSOM makes us to be alert about the increasing incidence of MRSA. In our study MRSA & MSSA both were found to be sensitive to Linezolid & both showed least sensitivity to Penicillin. This

finding of sensitivity was similar to that seen by Patigaroo *et al.*, in his study.¹⁹

These observations will thus help the clinicians in prescribing empirical treatment for CSOM patients, but at the same time these findings may not be suitable to be applied in all hospital settings of different areas, due to change in bacteriology & sensitivity from place to place.

CONCLUSION

In conclusion, we believe that our data may help the clinicians in our hospital mainly in selecting the appropriate antibiotic for empirical treatment & thus further to prevent further complications.

The changing pattern of causative agents & their antibiogram in CSOM should be monitored continuously & periodically to prevent the emergence & spread of resistant pathogens.

Conflict of interest

There are no Conflict of interest.

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