

Original Research Article

Antibiotic sensitivity and bacteriology of chronic suppurative otitis media in department of ENT in tertiary care centre St. John's Medical College and Hospital Bangalore

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ABSTRACT

Background: Chronic suppurative otitis media (CSOM) is a disease of middle ear. The aim of this study is to know the antibiotic sensitivity pattern in CSOM cases attending to ENT out patient department (OPD) in a tertiary care hospital and devise an appropriate antibiotic protocol to treat CSOM cases.

Methods: This is a prospective observational study. Fifty-eight patients of CSOM who present to the ENT OPD with ear discharge will be studied. Ear swabs of these patients will be collected and sent to microbiology to know the causative bacteria and their drug susceptibility.

Results: Of the 58 patients studied 64% were males and 36% were females. Of the organisms isolated *Stap aureus* (53%) was most common followed by *Pseudomonas* (36%). All the gram-positive organisms were sensitive to cotimoxazole, amikacin and gentamycin and all gram-negative organisms were sensitive to ciprofloxacin, amikacin and netlimycin.

Conclusions: It is better to collect an ear swab in all CSOM cases and then start antibiotics based upon the culture and sensitivity reports in order to improve the results and reduce the emergence of resistant strains, which can happen when antibiotics are prescribed randomly.

Keywords: CSOM, Antibiotic sensitivity, Bacteriology

INTRODUCTION

Chronic suppurative otitis media (CSOM) is defined as chronic inflammation of middle ear and mastoid cavity that may present with recurrent ear discharge through a tympanic membrane perforation.¹ Incidence of the disease is more common in lower socioeconomic groups due to poor hygiene malnutrition and overcrowding.²

CSOM is of two types safe and unsafe type. Safe type is called tubo-tympanic type and unsafe type as attico-antral type.³ Tubo-tympanic is called safe type as there are no complications seen whereas attico-antral is called as unsafe type as it is associated with complications.⁴ Most

common bacteria isolated from CSOM cases are *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella* and *Proteus* species.⁵

Aims and objectives

Aim and objectives of the study were to study the antibiotic sensitivity pattern in CSOM patients attending to ENT OPD in a tertiary care hospital and begin appropriate antibiotic protocol to be used in these patients. Complications associated with CSOM were common in prevalent bacteria. However, the introduction of antibiotics led to emergence of multidrug resistant bacterial strains.⁶

METHODS

This is a prospective observational study conducted in ST. JOHN’s medical college hospital Bangalore from. Patients of CSOM both unilateral and bilateral who presented with active purulent discharge to ENT department from January 2019 to March 2019 will be prospectively studied. Patients were of all age group, both sexes, and had symptoms of active ear discharge for more than 6 weeks. Patients suffering from MOE who are on systemic antibiotics and on topical medications to the ear were not included in the study. The ear discharge is collected using sterile cotton wool swabs under aseptic precautions with the aid of an aural speculum, before instillation of any topical medication. Swabs are then transported to the laboratory.

The first swab is used to make a smear on a glass slide for direct smear examination by Gram’s stain. Aerobic culture: The second swab will be processed for the isolation of aerobic bacteria. The swab on reaching laboratory will be inoculated on the following culture media: MacConkey agar and blood agar. Antibiotic sensitivity testing is performed by Kirby-Bauer disc diffusion method.

RESULTS

CSOM is a major public health problem and India is one of the countries with high prevalence where urgent attention is needed.⁷ CSOM is an important cause of preventable hearing loss.⁸ Of the 58 cases studied, 36 (64%) were males and 22 (36%) females.

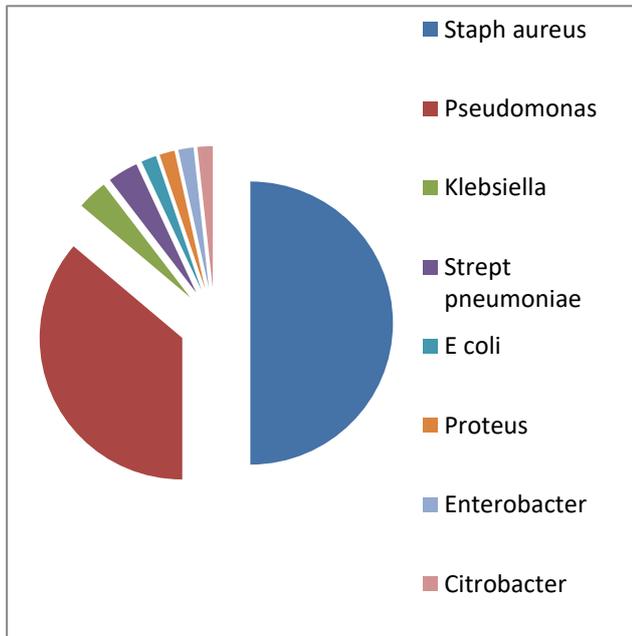


Figure 1: Organisms isolated from middle ear infection *Staphylococcus aureus* is the most common organism isolated followed by *Pseudomonas*.

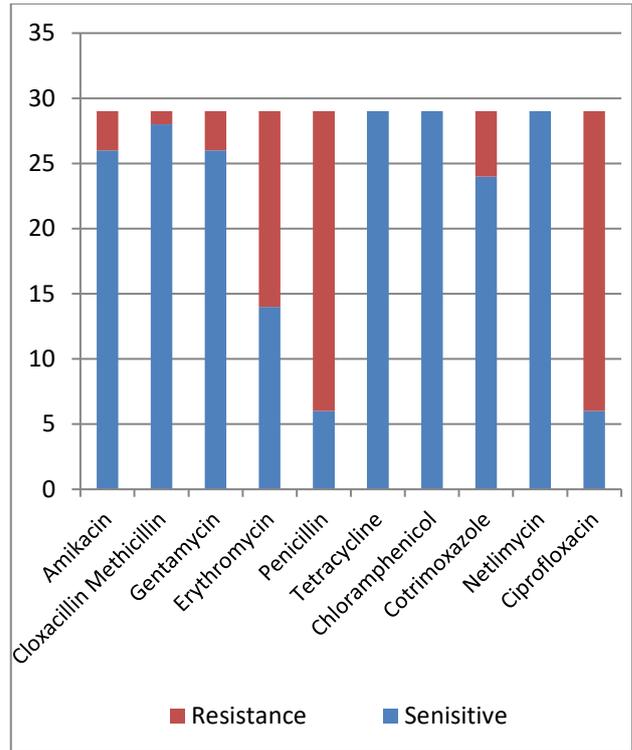


Figure 2: Antibiotic sensitivity pattern in *Staphylococcus aureus* showing sensitivity to tetracycline, chloramphenicol, netlimycin and resistance to penicillin and ciprofloxacin.

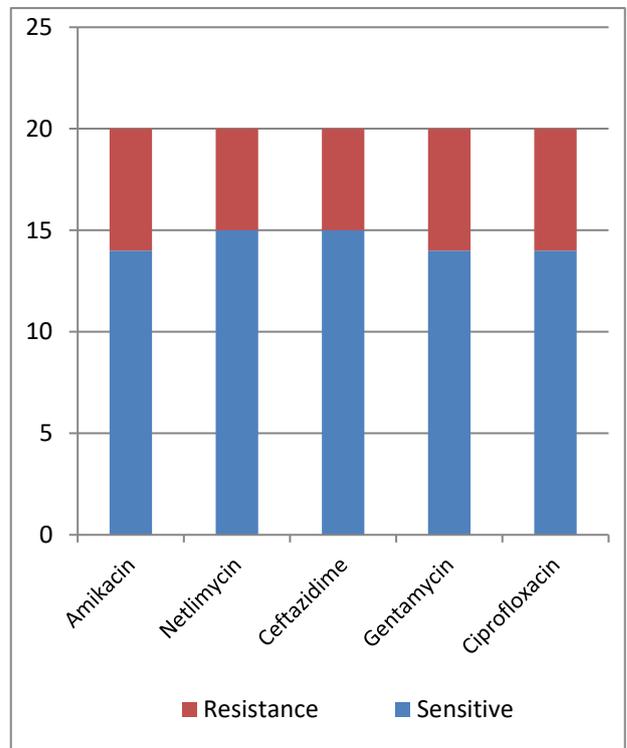


Figure 3: Antibiotic sensitivity pattern in *Pseudomonas* showing sensitivity to ciprofloxacin, amikacin and netlimycin.

DISCUSSION

A total of eight different microorganisms were isolated in this study, gram-positive bacteria predominated; *S. aureus* (50%) being the most common one followed by Gram negative and that being *Pseudomonas* (34%), *Klebsiella* (3%), *Streptococcus pneumonia* (3%), *E. coli* (1.5%), *Proteus mirabilis* (1.5%), *Citobacter* (1.5%) and *Enterobacter* (1.5%) Figure 1. Out of the gram-positive bacteria isolated, all (100%) were sensitive to cotrimoxazole, amikacin, gentamycin. Gram-positive bacteria showed resistance against penicillin (100%) and to azithromycin and ciprofloxacin Figure 2. Out of 29 culture samples growing *Staphylococcus aureus* 4 were methicillin resistant and found to be sensitive only to vancomycin, netlimycin and tetracycline and resistant to penicillin, erythromycin and ciprofloxacin. Antibiotic susceptibility testing done for gram-negative bacteria like *Pseudomonas* showed higher susceptibility toward ciprofloxacin, amikacin and netlimycin Figure 3. *Klebsiella* was sensitive to amikacin, gentamycin, ceftazidime, cefuroxime, netlimycin, ciprofloxacin, and cefotaxime and resistance to amoxicillin.

E. coli was sensitive to amikacin, gentamycin, meropenem, and netlimycin and resistant to amoxicillin, ceftazidime, cefuroxime, ceftazidime, and ciprofloxacin. *Proteus* was sensitive to only piperacillin tazobactam and meropenem and resistant to amikacin, ciprofloxacin, gentamycin, amoxicillin, and netlimycin. *Streptococcus pneumonia* was sensitive to cefotaxime and penicillin and resistant to erythromycin and cotrimoxazole. *Citobacter* was sensitive to amikacin, meropenem, ciprofloxacin and gentamycin. *Enterobacter* was sensitive to amikacin, ceftazidime, cefuroxime, ciprofloxacin, and gentamycin and resistant to amoxicillin.

CONCLUSION

The result of this study showed high prevalence and resistance of *Staphylococcus* and *Pseudomonas* to beta lactam and other commonly used antibiotics and emergence of MRSA is a worrying trend. Therefore, an appropriate knowledge of antibiotic susceptibility of micro-organisms may contribute to rational use of antibiotics and prevent the emergence of resistant strains of bacteria.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Jahn AF. Chronic otitis media: Diagnosis and treatment. *Med Clin North Am.* 1991;75:1277-91.
2. Shaheen MM, Raquib A, Ahmad SM. Prevalence and associated socio-demographic factors of chronic suppurative otitis media among rural primary school children of Bangladesh. *Int J Pediatr Otorhinolaryngol.* 2012;76:1201-4.
3. Kumar H, Seth S. Bacterial and fungal study of 100 cases of chronic suppurative otitis media. *J Clin Diagn Res.* 2011;5:1224-7.
4. Rout MR, Mohanty D, Vijaylaxmi Y, Kamalesh B, Chakradhar M. Prevalence of cholesteatoma in chronic suppurative otitis media with central perforation. *Indian J Otol.* 2012;18:7-10.
5. Deb T, Ray D. A study of the bacteriological profile of chronic suppurative otitis media in Agartala. *Indian J Otolaryngol Head Neck Surg.* 2012;64:326-9.
6. Lee SK, Park DC, Kim MG, Boo SH, Choi YJ, Byun JY et al. Rate of isolation and trends of antimicrobial resistance of multidrug resistant *Pseudomonas aeruginosa* from otorrhea in chronic suppurative otitis media. *Clin Exp Otorhinolaryngol.* 2012;5:17-22.
7. Acuin J. Geneva: World Health Organisation; Global burden of disease due to chronic suppurative otitis media: Disease, deafness, deaths and DALYs Chronic Suppurative Otitis Media-Burden of Illness and Management Options. 2004;9-23. Available at: https://www.who.int/pbd/publications/Chronicsuppurativeotitis_media.pdf. Accessed on 23 September 2021.
8. Abiodun O. Otitis media as a cause of significant hearing loss among Nigerians. *Int j pediatric otorhinolaryngol.* 2008;72:787-92.

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