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Original Research Article

Assessment of Antibiotic Sensitivity Patterns in Chronic Otitis Media

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Abstract:

Background: Chronic otitis media (COM) is defined as chronic inflammation of middle ear and mastoidcavity that may present with recurrent ear discharges or otorrhoea through a tympanic perforation.

Methods: A prospective cross-sectional analysis was performed using antibiotic susceptibility test. Study duration is July 2023 to June 2024.

Results: Antibiotic resistance was seen in case of the commonly used antibiotics like ampicillin,amoxicillin, Amoxicillin+ Clavulanic acid. Cephalosporins were less commonly used antibiotics andshowed resistance in 40.00% cases. Cotrimoxazole showed about 50.00% resistant cases. The lesscommonly used antibiotic was vancomycin however, showed high sensitivity (100%) followed byLinezolid (92.00%).

Conclusion: Atibiotic sensitivity has been changing over time with high levels of resistance tocommonly used antibiotics.

Keywords: Antibiotic Sensitivity, Chronic Otitis Media, Ear Discharge.

Introduction

Chronic otitis media (COM) is defined as chronic inflammation of middle ear and mastoid cavity that may present with recurrent ear dischargesor otorrhoea through a tympanic perforation. [1]COM is prevalent worldwide maximally affecting the developing or underdeveloped countriesespecially in areas of poor socio-economic standards owing to factors such as malnutrition, overcrowding and poor hygiene. [2] Due to its recurrent nature and the development of resistant pathogenic organisms, control of infection in COM now poses a greatest therapeutic challenge. Often, the primary care physicians, who first see these patients, rely on empirical antibiotic therapy. Irrational and unethical use of antibiotics has led to high resistance patterns and increase in burden of thedisease and its complications. This has been confirmed by various studies which have broughtout the changes in bacterial flora and their resistance patterns in COM in the last decade. [3,4]

Material and Methods

Place of study: ENT Department at Darbhanga Medical College and Hospital Laheriasarai, Darbhanga, Bihar. Study duration is July 2023 To June 2024.

Type of study: Prospective cross sectional observational study, Department of ENT, DMCH

Inclusion Criteria

All cases of CSOM both mucosal and squamous, who reported to the ENT OPD were included in the study. Only samples growing aerobic bacterial organisms were included in the study.

Exclusion Criteria

Cases exhibited antibiotic either systemic or topical in the ear in last 2 weeks or patients who had clinical evidence of otomycosis, otitis externa, and or acute otitis media.

Sample collection -Cotton tipped swab was taken from each patient and sent for antibiotic sensitivity pattern. All care was taken to avoid surface contamination and the swabs were takento the microbiology laboratory for further bacteriological processing. Nonbacterial flora such as fungi and anaerobic organisms were not included in the present study.

Statistical analysis- Mean and ratio proportionwas calculated for analysis using Statistical Package for Social Sciences (SPSS) version 22.

Results

A total of 50 samples were collected during the period of study from cases of CSOM bothmucosal type (70%) and squamous type (30%).

In our study, age group of patients ranged from 0to 80 years (mean age – 32.85±12.38 years). The sex ratio obtained was female to male ratio

preponderance was 1:1.17.

Table 1: Resistance and sensitivity observed against various antibiotics.

Antibiotic	Resistance	Sensitive
Methicillin	70.00%	30.00%
Gentamicin	16.00%	84.00%
Vancomycin	0.00%	100.00%
Ciprofloxacin	74.00%	26.00%
Cotrimoxazole	50.00%	50.00%
Linezolid	8.00%	92.00%
Ampicillin	70.00%	30.00%
Amoxycillin	72.00%	28.00%
Amoxycillin+clavulanate	90.00%	10.00%
Amikacin	20.00%	80.00%
Cephalexin	40.00%	60.00%
Cefotaxime	28.00%	72.00%

Antibiotic resistance was seen in case of the commonly used antibiotics like ampicillin, amoxicillin, Amoxicillin+Clavulanic acid. Cephalosporins were less commonly used antibiotics and showed resistance in 40.00% cases. Cotrimoxazole showed about 50.00% resistant cases. The less commonly used antibiotic was vancomycin however, showed high sensitivity (100%) followed by Linezolid (92.00%).

Discussion

World Health Organization has listed antibiotic resistance as a growing global problem which poses a major threat to health. [1] Higher incidence of CSOM is common in cases due to the malnutrition, overcrowding and poorhygiene and hence is more commonly seen to occur in communities from poor socio-economic standards. [2] Both gram positive and gramnegative organisms contribute to the bacteriological profile of CSOM infection.

Proper antibiotic profile is essential for timelytreatment as also to reduce the menace of antibiotic resistance. This study was therefore undertaken to define the resistance pattern to commonly administered antibiotics in cases ofCSOM. Based on the antibiogram, there was high resistance to Ampicilin, Amoxycillin/Clauvalinic acid and Trimethoprim/ Sulphamethoxazole combinations across complete spectrum of bacterial isolates. It showed high resistance

pattern to Ampicilin, Amoxycillin/Clauvalinic acid and Trimethoprim/ Sulphamethoxazole and also a high resistance to Aminogylcosides. This is in variance with other studies such as Prakash et al who showed good response of Amikacin to Pseudomonas. [3] This shows development of increase in resistance patterns of the organism maybe as a result of rampant misuse of these antibiotics over time. The mechanism of resistance is believed to be mediated by formation of biofilms by this organism. [5]

Conclusion

Antibiotic sensitivity has been changing over time with high levels of resistance to commonly used antibiotics. Periodical assessment of microbiological profile is therefore essential for making effective protocols for cases of CSOM.

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