

A BACTERIOLOGICAL INVESTIGATION OF CHRONIC SUPPURATIVE OTITIS MEDIA**Deepti Pandey***

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ABSTRACT

Microbiological investigation of ear discharge in 72 patients of chronic suppurative otitis media with perforation was performed to ascertain local pattern of causal microbes and their antibiotic susceptibility. Staphylococci and Pseudomonas species were the most prevalent causal organisms. Excellent broad spectrum treatment potentials were found for gentamycin and ciprofloxacin, while, chloramphenicol is useful, as well. Augmentin appeared to be falling out in efficacy, against the staphylococci. Findings enlighten upon selection of initial empirical antibiotic therapy and subsequent strategic antibiotic options for successful infection clearance in CSOM.

KEYWORDS: CSOM, Antimicrobials, staphylococci, pseudomonas.**INTRODUCTION**

Chronic suppurative otitis media is inflammatory involvement of middle ear and mastoid cavity that presents with recurrent discharge through perforated eardrum. The disease has antecedent in childhood acute infective or secretory otitis media.^[1-3] Patients with tympanic perforation, with mucoid discharge, for several weeks to 3 months, despite medical treatment, are diagnosed as CSOM. It is common ear infection, afflicting over 7% of third world population.^[4] Over 10% of CSOM cases develop complications^[5], with serious morbidity and even mortality.^[6] The complications range from persisting otorrhea, mastoiditis, labyrinthitis, facial nerve paralysis and intracranial abscess or thrombosis.^[7-9] A local evidence base of prevalent infection pattern can guide, choice of timely empirical antimicrobial therapy and consequent others to achieve goal of safe dry ear, through eradicating disease and improving hearing function. Present study, prospectively, gathers information on microbial profiles and their antibiotic susceptibility in patients with CSOM of the Kumaon region of Uttarakhand.

PATIENTS AND METHOD

Study was carried out in ENT outdoor of Krishna Hospital and Research Centre, Haldwani, Uttarakhand, over one year period from July 2014 to June 2015. The prospective study included, patients with perforated tympanic membrane and active purulent discharge, with no systemic or topical antibiotic treatment, over, at least preceding 5 days. Patients' age, sex and clinical history details, were recorded with specific note of, duration of ear discharge and prior treatment, if any. Sample of middle ear discharge, oozing out through tympanic

perforation, was carefully collected on swab, avoiding contact with external auditory canal. It was sealed in sterile vial and immediately, sent to microbiology lab where it was processed in less than 3 hour period.

A total of 72 culture swabs, from 72 patients, were sent for examination. Their processing, to isolate aerobic and anaerobic organisms, was as per standard lab procedures. Antibiotic sensitivity of the cultured organisms was carried out, as per standard method.^[10] Susceptibility was examined to penicillin G 10U; ampicillin 10ug; augmentine 30ug; TMS 1.25/23.75ug; cephalothin 30ug; polymixineB 300U; ceftazidime 30ug; piperacillin 100ug; chloramphenicol 30ug; ciprofloxacin 5ug; amikacin 30ug; gentamycin 10ug; neomycin 30ug; bacitracin 10U. As obvious, the screen also included, sensitivity test, against topically used agents gentamycin, neomycin, chloramphenicol and bacitracin. Sensitivity or resistance was inferred following standard criteria.^[11]

OBSERVATIONS AND RESULT

Age wise, the patients were distributed in various categories, as, under 12 yr age, 3; between 12 to 20 yr age, 15; between 21 to 30 yr age, 26; between 31-40yr age, 8; between 40-50 yr age, 13 and above 50 year age, 7.

Of the 72 swabs, sent for culture sensitivity, 68 yielded positive microbial growth and 4 remained negative. Only dominant microbe colonies were considered, ignoring insignificant aberrant, in culture plates.

Frequency of detection of various microbial classes is shown in table 1.

Commonest organisms identified, were, Staphylococcus aureus (methicilline sensitive), in 27 of 72; Staph aureus (methicilline resistant), in 9 of 72 and Pseudomonas aeruginosa in 22 of 72 patients. Other microbes, afflicting 3 cases each, were coagulase negative Staphylococcus, Proteus mirabilis and Escherichia coli. One instance of isolation of Citrobacter was seen.

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Table 1. Frequency of detection of various microbial classes

S. No	MICROBE	(n)	%AGE
1.	Gram positive	27	37.5
	Staph aureus (methicillin sensitive)		
2.	Staph aureus (methicillin resistant)	9	12.5
3.	Coagulase negative staphalococci	3	4.2
4.	Gram negative	22	30.5
	Pseudomonas aeruginosa		
5.	Proteus mirabilis	3	4.2
6.	E coli	3	4.2
7.	Citrobacter	1	1.4
8.	Anaerobic Bacterioids	-	0.0
9.	No growth	4	5.6

Sensitivity profile of the microbes, to various antibiotics is presented in table 2. Instances of less than 50% isolates shown sensitive, were ignored. Also, untested agents are not shown.

Table 2. Sensitivity profile of the microbes

Micro organism	% isolates exhibiting sensitivity to depicted antimicrobial agents												
	AMP	CoT	AmC	CTN	PmB	CaZ	PiP	C	Cip	AK	GM	Neo	Bac
Methicillin sensitive staph aureus	-	70	65	50	-	-	-	80	80	80	85	-	80
Methicillin resistant staph aureus	-	70	-	-	-	-	-	70	60	80	85	-	80
Coagulase -ve staph	55	-	55	-	-	-	-	65	80	80	90	-	80
Pseudomonas ae	-	-	-	-	-	100	80	80	85	80	90	80	-
Proteus mirabilis	67	67	83	-	50	70	85	70	85	70	85	70	-
E coli	75	75	75	-	50	75	75	75	100	75	100	75	-

Abbreviations

AMP-ampicilline, CoT-cotrimoxazole, AmC-augmentin, CTN-cephalothin, PmB-polymixinB, CaZ-ceftazidime, PiP-piperacillin, C-chloramphenicol, Cip-ciprofloxacin, AK-amikacin, GM-gentamycin Neo-neomycin and Bac-bacitracin. The gentamycin ear drops have highest efficacy and chlorempenichol is also, fairly effective. Topical bacitracin has potential against gram positive and topical neomycin, against gram negative organisms.

DISCUSSION AND CONCLUSION

Perforated tympanic membrane allows bacterial entry from external to middle ear cavity. Most of causal organisms show, worrisome antimicrobial resistance profile. In order to prevent the dangerous complications, antimicrobial treatment has to be started early and effectively. Medical treatment aims, at eradicating the pathogenic organisms.^[12] and in case of resistant organisms, surgery has to be resorted to. Selection of antibiotics would be based on microbial sensitivity, systemic efficacy and safety, as well as, cost. Amongst commonest causal organisms, gentamycin, ciprofloxacin and bacitracin showed good potential to treat

staphylococcal infection. For pseudomonas, ceftazidime, gentamycin, ciprofloxacin and piperacillin were very efficacious. The common trend of empirical use of augmentin, requires to be revised, as resistant organisms have expanded. The concern over ciprofloxacin ear drop use for ototoxicity may not be relevant. Otitis media itself increases risk of sensorineural hearing loss.^[13]

The study provides local evidence, based on causal organism profile in chronic suppurative otitis media and their antimicrobial susceptibility patterns. The information should improve choice of empirical antibiotics for early treatment and limitation of complications of CSOM. The same should also reduce instances of resistance development.

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