International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 30-03-2019; Accepted: 01-05-2019
www.medicalsciencejournal.com
Volume 5; Issue 6; June 2019; Page No. 34-36

Antibiogram in tertiary care centre

Roosewelt Simon[1], Mohammad Ashraf[2]
[1, 2] Department of ENT, S.S. Medical College, Rewa, Madhya Pradesh, India

Abstract
A total 100 samples of patients with chronic suppurative otitis media (C.S.O.M.) were studied bacteriologically. Ear infection was found to be more common in paediatric population (70.96%). Males suffered more than females. A total of 124 bacterial isolates were seen with preponderance of gram negative bacilli. *Pseudomonas* (38.7%) out-numbered others. Ciprofloxacin, Piperacillin, Amikacin and Gentamicin were found to be the most effective drugs.

Keywords: middle ear infection, bacteriological profile, chronic suppurative otitis media

Introduction
Chronic Suppurative Otitis Media is an important global public health problem leading to hearing impairment, which may have serious long-term effects on language, auditory, cognitive development and educational progress. CSOM and its complications are among the most common conditions seen by otologists, pediatricians and general practitioners. It is a disease of multiple aetiology, well known for its persistence and recurrence in spite of treatment. High rate of CSOM have been attributed to overcrowding, inadequate housing, poor hygiene, high rates of nasopharyngeal colonization with pathogenic bacteria and inadequate health care facility. Poverty is a major risk factor in developing countries.

Typically the disease follows viral infections of upper respiratory tract, but soon invades middle ear with pyogenic organism. The widespread use of antibiotics has precipitated emergence of resistant strains of bacteria which can produce both primary and postoperative infections. Indiscriminate, haphazard and half hearted use of antibiotics and poor follow up of patients have resulted in persistent low grade infections. Changes in the microbiological flora following the advent of newer antibiotics increases the relevance of reappraisal of the modern day flora in CSOM antibiogram is very important for the clinician to plan a general outline of treatment for a patient with chronically discharging ear.

Materials and Methods
The present study was carried out from September 2018 to March 2019 in the Department of ENT S.S. Medical College Rewa (M.P.), India. The study was carried out on100 samples obtained from outpatients department (OPD) of ENT randomly. No exemption of age, sex, side or type of special pathology was made.

The ear discharge was tested from those patients only who had a clinical diagnosis of CSOM and had not taken any treatment, especially in the form of ear drops within previous 5 to 7 days of sampling. Purulent exudates were taken on the first day before any medication was started using sterilized ear speculum and sterile cotton wool swabs, specially prepared and autoclaved. All care was taken to avoid surface contamination and the swabs were taken to the microbiology laboratory for further bacteriological processing. In occasional cases of delay, Cary Blair transport medium was used. In the laboratory, on primary basis samples were examined microscopically by staining in order to demonstrate the presence of gram positive and gram negative organisms. Subsequently, every specimen was inoculated on nutrient agar, blood agar and Mac Conkey agar plates. Inoculated plates were incubated at 37ºC overnight. After incubation the plates were examined for selective growth of organisms. Bacterial isolates were identified according to criteria of Edwards and Ewing (1972).

The organisms were identified by culture characters, morphology, and pigment production, haemolysis in blood agar, motility and relevant conventional biochemical tests. Antibiotic sensitivity was performed according to standardized disc agar diffusion method of Bauer *et al*. (1996).

Observation
The total number of cases submitted for bacteriological studies included 100 CSOM patients, out of which 62 (62%) were males and 38 (38%) were females. Age varied from 1 year to 65 years. Majority of infections (70.96%) were seen below twenty years of age and incidence was progressively less in adults (table 1).

Out of 100 samples collected from patients, 124 bacterial strains were isolated. Paediatric age group (<14 years), was commonly involved. Males out numbered the females (1.2:1.0). In seventy seven (77%) cases single organism i.e., monobacterial infection was isolated and in twenty three (23%) cases more than one organism was isolated.

The present study showed predominance of *Pseudomonas aeruginosa* with 38.7% (48), followed by *Staphylococcus aureus* 24.19% (30). *E.coli* 12.09% (15), *Proteus* 9.68% (12). It was observed that most of the isolates were sensitive to ciprofloxacin, amikacin and aminoglycosides and gatifloxacin

Table 1: Age group, sex wise distribution and incidence rate of CSOM

Age in years	Sex		Total	No. of isolates	%
	Male	Female			
0-10	17	7	24	30	24.19
10-20	28	19	47	58	46.77
20-30	7	6	13	13	10.48
30-40	3	2	5	7	15.64
>40	7	4	11	16	12.9
Total	62	38	100	124	

Table 2: Type of organisms isolated.

S. No.	Organism isolated	Percentage
1	*Pseudomonas aerugnosa*	38.7%
2	*Staphylococcus aureus*	24.19%
3	*Escherichia coli*	12.09%
4	*Proteus mirabilis*	9.68%

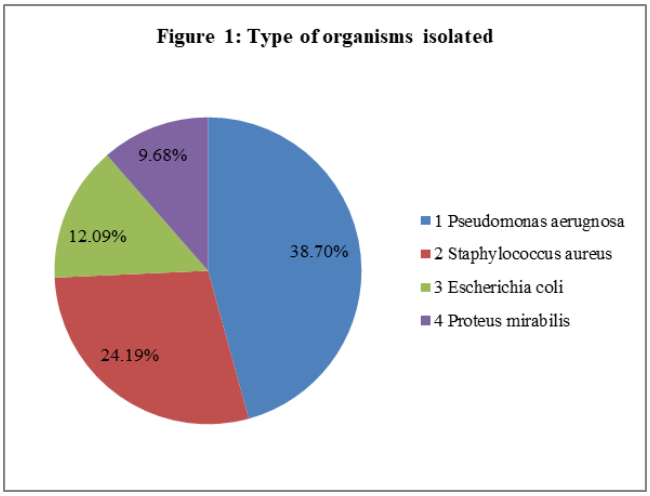

Fig 1: Types of organisms isolated.

Table 3: Antibiotic sensitivity for the organisms *Pseudomonas aeruginosa*

S. No.	Antibiotic	Sensitivity	Percentage
1	Amikacin	40	95
2	Aztreonam	25	52
3	Ceftazidime	25	60
4	Cefipime	28	60
5	Cefuroxime	35	75
6	Ciprofloxacin	40	92
7	Piperacillin	40	90
8	Ofloxacin	40	88
9	Tobramicin	40	90
10	Netilmicin	40	89
11	Imipinem	42	93
12	Meropenem	40	87
13	Gentamicin	41	89

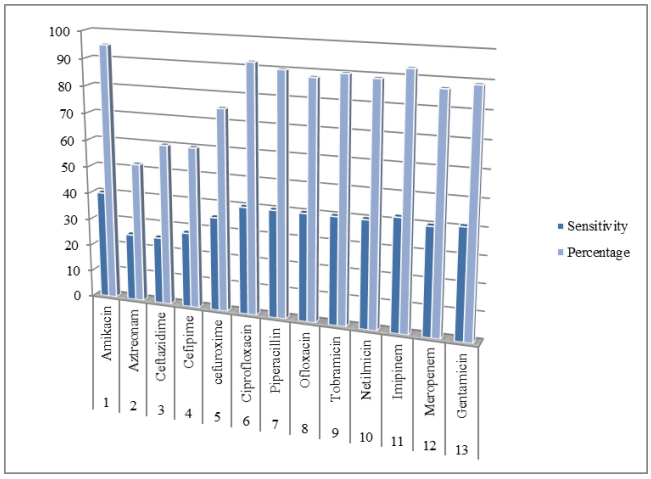

Fig 2: Antibiotic susceptibility pattern of *Pseudomonas aeruginosa*

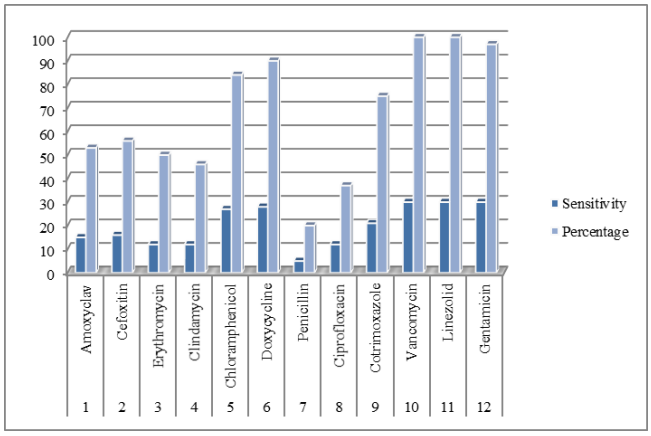

Fig 3: Antibiotic susceptibility pattern of *Staphylococcus aureus*

Discussion

CSOM is a common infection; with life threating complications. Early bacteriological diagnosis of all cases will assume accurate and appropriate effective therapy. It was observed in the present study that majority of the patients were from paediatric age (70.96%) group.

Baruah (1972) in his study reported 44.17% involvement of paediatric age group. Poorey and Aart Iyer (2002); Arti Agrawal *et al*. (2013); & Choudhary, B.L. *et al*. (2014) also indicated the high incidence among paediatric age group. The highest incidence in the first two decades of life, especially in young children is due to short, wide and straight Eustachian tube and presence of infective focus in adenoids and tonsils. Bacteria from nasopharynx reaches into middle ear resulting in its infection. Various aerobic bacteria like proteus, staphylococcus aureus, E.coli, pseudomonas etc. have been reported in CSOM. Both gram

positive and negative organisms are responsible for infection of middle ear.

Osteedid & Rubinskin (1980) *et al*., observed in their study that gram negative rods outnumber the gram positive organisms in CSOM. In the present study pseudomonas was the predominant organism followed by staph aureus. It is in line with the findings of other investigators as Ayyagari *et al*. (1981)[10], Poorey and Aart Iyer (2002), Harvinder Kumar & Sonia Seth, (2011), & Rakesh Kumar *et al*. (2013). Rao & Reddy (1994) isolated staphylococcus aureus (42.5%) predominatly. Hence, pseudomonas continues to reign supreme as prime offender and poses problem for effective therapeutic control. Staphylococcus bears the inherent trait of resistance., while proteus is notorious for resurfacing being essentially saprophytic. It appears that this era of antibiotics, is giving way to an age of anxiety, as the emergence of antibiotic resistance is becoming more prudent. Desa (1985) showed in his study that bacterial "generation gap" can be as little as 20 minutes.

Commetta & Calandral (1994) highlighted in their study that bacteria inherits the resistance from their predecessor. New genes mediating resistance are usually transferred from cell to cell, by way of mobile genetic elements such as plasmids, transfer on and bacteriophages. Human negligence is also responsible for the development of antibiotic resistance. As soon as symptoms subside, many patients stop taking antibiotics before completion of therapy and allow partially resistant microbes to flourish.

Book & Yocum (1989) stated that it is baseless to succumb to the demands of patients with viral infection and prescribe antibiotics, indiscriminately. This may make the existing bacteria more resistant and result in the production of stronger and more recalcitrant strain.

Picozzi (1982) in his study showed that pseudomonas and proteus species do not normally inhabit the upper respiratory tract and their emergence in chronic middle ear infection cannot be ascribed to the primary derivation from the nasopharynx through the Eustachian tube. These organisms were considered mostly secondary invaders from the external canal entering the middle ear via the perforated tympanic membrane resulting from an acute episode of otitis media.

In the present study antibiotic susceptibility pattern of *Pseudomonas aeruginosa* showed highest sensitivity for Amikacin, Ciprofloxacin, Piperacillin, Netilmicin, Imipenem, Meropenem and Gentamicin. Antibiotic susceptibility pattern of *Staphylococcus aureus* showed highest sensitivity for Linezolid, Vancomycin, followed by Gentamicin and Doxycycline. Our findings correlate with the study conducted by Harvinder Kumar & Sonia Seth, (2011) and Y.K. Harshika *et al*. 2015.

Last but not the least, every referral centre, medical college should have routine antibiogram so as to avoid drug resistance, cross resistance amongst these antibiotics.

Conclusion

Pseudomonas sp. and *Staph aureus* were found to be the commonest cause of otitis media in our study. Proper antibiotic therapy can help in eliminating these infection.

References

1. Rama Rao MV, Grewal BS, Cad MS. Bacterial study of CSOM journal of Indian Medical Assocition J. 1980; 6:317.
2. Osteeld E, Rubinskin E. Ann. Otol. Rginol Laryngol. 1980; 89:33.
3. Ayyagari A, pancholi VK, Pandhi SC, Goswami A, Aggarwal KC. Anaerobic Beacteria in chronic otitis media Indian Journal of Medical research. 1981; 73:860-65.
4. Sween G, Picozzi GL, V Browny CG. A quantitative study of aerobic and anaerobic bacteria in CSOM' Journal of infection. 1982; 5:47.
5. Desai B, Hussin M, Panhotra BR. Chronic suppriative otitis media, a bacteriological study. Indian paediatrics. 1985; 22:417-22.
6. Comeeta A. Ca;andra T, Bille J, Glauser MP. Escheria resistant to flucro-quinlones in patients cancer and neutropenia new Eng, Med J. 1994; 330:1240-1341.
7. Brook I, Yocum P. Quantitative bacterial cultures and beta lactamase activity in chornic suppurative ottis media SK. Investigative profile in patients of chronic suppurative otitis media. Indian journal of otology. 1997; 3(2).
8. Poorey VK, Arati Iyer. Study of Bacterial Flora in Chronic Suppurative Otitis Media and its clinical significance. Ind. J. Otolaryngol H & N Surg. 2002; 54(2):91-95.
9. Mansoor T, Musani MA, Gulnaz Khalid, Mustafa Kamal. Pseudomonas aeruginosa in chronic suppurative otitis media: Sensitivity spectrum against various antibiotics in Karachi. J Ayub Med Coll Abbottabad. 2009; 21(2):120-123.
10. Harvinder Kumar, Sonia Seth. Bacterial and Fungal Study of 100 cases of Chronic Suppurative Otitis Media. Journal of Clinical and Diagnostic Research. 2011; 5(6):1224-1227.
11. Arati Agarwal, Kumar D, Ankur Goyal, Sapna Goyal, Namrata Singh, Khandewal G. Microbiological profile and their antimicrobial sensitivity pattern in patients of otitis media with ear discharge. Indian Journal of Otology. 2013; 19(1):5-8.
12. Harshika YK, Sangeetha S, Prakash R. Microbiological profile of CSOM and their antibiotic sensitivity pattern in a tertiary care hospital. Int. J. Curr. Microbiol. App. Sci. 2015; 4(12):735-743.
13. Patel KN, Shrimali GP, Thakor N. Bacteriological profile isolated from cases of otitis media diagnosed at tertiary care hospital of Gujarat, India. Int J Res Med Sci. 2016; 4:3891-4.
14. Deb T, Ray D. A study of bacteriological profile of Chronic Suppurative Otitis Media in Agartala. Indian J Otolaryngol Head Neck Surg. 2012; 64(4):326-329.
15. Malpani M, Ahire GP, Saha P, Sankhe K. Bacteriological profile of chronic suppurative otitis media in a rural tertiary care hospital. National Journal of Medical and Dental Research. 2016; 4(2):71-76.