



A STUDY ON EAR DISCHARGE, PROFILE OF BACTERIA CAUSING OTITIS MEDIA AND ITS ANTIMICROBIAL SENSITIVITY IN A TERTIARY CARE HOSPITAL.

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ABSTRACT **Background** Middle ear infection is one of the commonest condition found during general practise in our country.This study was conducted to identify the bacterial causes of ear discharge, with a focus on the bacterial isolates' patterns of antibiotic susceptibility in order to facilitate effective treatment.This Study was carried out in 70 cases of otitis media attending the ENT opd The organisms were identified and bacterial sensitivity of the isolates to the commonly used antibiotic was investigated. A total of 70 patients were included in this study. Out of the 70 cases examined 5 pathogenic strains were isolated. The findings of our study, which identified the most frequent ear infection-causing agents and their patterns of sensitivity and resistance, will aid in the appropriate selection of empirical antibiotic therapy and the prevention of the emergence of resistant strains .

KEYWORDS : otitis media , bacterial etiologies, antibiotic susceptibility

INTRODUCTION:

Chronic suppurative otitis media (CSOM) is a chronic inflammation of the mucoperiosteal lining of the middle ear cleft. The main route of spread of infection to the middle ear is through the eustachian tube from the nasopharynx [1,2] It is a persistent disease of the middle ear, which is capable of causing severe destruction sequelae with the manifestation of deafness, discharge, and a permanent perforation. [18] This disease can be classified into Tubotympanic and Atticoantral disease. The causes of infection in children this usually due to adenoids. In adults the causative infections may be in the nose, paranasal sinuses, or in the oropharynx. All these conditions are ascending infection of the Eustachian tube. Developing countries like India have higher prevalence (>4%). CSOM is mostly caused by bacteria. Otitis media is an infection of the middle ear and mastoid mucosa and in the chronic condition tympanic membrane is perforated and discharge is present. It is a destructive and persistent disease with irreversible sequelae and can proceed to serious intra and extra cranial complications. The disease is common in all age all age group mainly in low socio economic status and found to be more prevalent during high humidity environment with profound impact in hearing. It is an important cause of preventable hearing loss, affects children's language development and intellectual performance Between 65 and 330 million individuals globally get ear infections, and 60% of them experience significant loss of hearing. This is the cause of significant economic and health issues, particularly in developing countries with little resources for diagnosis and treatment. [2]

Normal skin flora like *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Proteus mirabilis*, *Klebsiella pneumoniae*, and *Escherichia coli* can enter through perforated ears despite the cerumen's inherent defensive systems, which have antibacterial qualities. [3]

Ear infection may be of bacterial, fungal or viral origin. Bacteria are isolated in 50 – 60% of the cases . Various bacterial species have been found to be associated with ear infections *Streptococcus pneumoniae*, *Haemophilus influenza* and *Moraxella catarrhalis* most common causative organism for acute otitis media . The major causes of Chronic Suppurative Otitis Media are *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Proteus* species, *Klebsiella* species, *Escherichia coli* and anaerobes.

The widespread use of the antibiotics and the poor follow up of the patients has precipitated the emergence of multiple resistant strains of bacteria

MATERIALS AND METHODS

A prospective study was carried out in 70 patients attending the E.N.T OP, THOOTHUKUDI MEDICAL COLLEGE . The study was done after proper patient informed consent . Detailed clinical history was taken. Aural swabs were taken on the first day of attendance of the patient to the E.N.T OP under strict aseptic precautions and swabs were taken to microbiological laboratory and the same cultured on blood agar, nutrient agar and MacConkey agar along with biochemical

reactions to isolate the bacteria. The organisms were identified and bacterial sensitivity of the isolates to the commonly used antibiotic was investigated by Muller Hinton agar and disk diffusion method.

RESULT:

A total of 70 patients were included in this study. Among them 36 males (51.4%) and 34 females (48.5%) with the ratio of 1.05:1 . Age range was from 3 to 60 years. In the age group of 1-15 years, 18 individual was affected. There were 30 in the age group of 16–30 years, 10 in the age group of 31-45 years, 12 patients in the age group of 46-65 years. Hence, the most common age group affected is reported to be between 15 to 30 years of age followed by 1 to 15 years. Out of the 70 cases examined 5 pathogenic strains were isolated. Pure growth was found in 88.5% cases and No growth in 11.4%. *Pseudomonas* 24(34.25%) was the most common organism isolated followed by *Klebsiella pneumoniae* 18 (22.85%), *Staphylococcus aureus* 10(14.28%), Coagulase negative *staphylococcus aureus* (CONS) 8(11.42%), *Proteus* 4(5.71%). Cipro and cefaperazone sulbactam remains the effective treatment. Factors like swimming and scratching the ear using buds most common predisposing factor for otitis media . The right ear (54.28%) most commonly affected than left ear(45.71%)

TABLE 1 : DISTRIBUTION OF EAR INFECTION IN RELATION TO AGE AND SEX

AGE	MALE	FEMALE	TOTAL NO OF PATIENTS	%
1 – 15	8	10	18	25.7%
15 – 30	16	14	30	42.8%
30 – 45	6	4	10	14.2%
45 – 65	6	6	12	17.14%

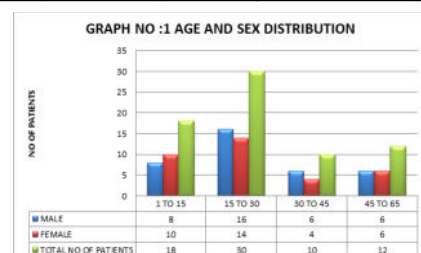


TABLE 4: Organisms that were isolated from the clinical samples :

TYPES OF ORGANISMS	NUMBER OF ISOLATES
<i>Pseudomonas</i>	24(34.25%)
<i>Klebsiella Pneumoniae</i>	16(22.85%)
<i>Staphylococcus Aureus</i>	10(14.28%)
Cons	8(11.42%)
<i>Proteus</i>	4(5.71%)

GRAPH NO :4 BACTERIOLOGICAL PROFILE

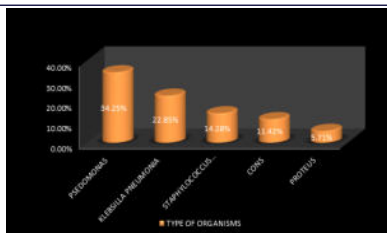


TABLE 5: Antibiotic Sensitivity For The Various Organisms That Were Isolated(18)

ORG AB	COPS (10 ISOLATES)	CONS (8 ISOLATES)	PSEUDOMONAS (24 ISOLATES)	KLEBSIELLA (16 ISOLATES)	PROTEUS (4 ISOLATES)
AMOXICILLIN	60%	83%	0	81%	60%
CIPROFLOXACIN	0	100%	87.5%	91%	100%
CEPHELEXIN	88%	91%	0	70%	78%
CEFIXIME	90%	93%	36%	89%	83%
CEFTRIAZONE	75%	75%	80%	87%	96%
CEFEPIME	88%	85%	88%	94%	100%
PIPERACILLIN TAZOBACTAM	95%	94%	93%	98%	100%

The antibiotics highlighted in the above tables are those drugs that were available in the department at the time of study.

DISCUSSION:

Since ear infections are a prevalent condition that affect people of all ages, despite newborns and young children are more frequently affected because they have short Eustachian tubes, which make it easier for microorganisms to enter the nasopharynx. [3]. Accurate determination of the microbiological aetiology and drug susceptibility will help with treatment and avoid antibiotic resistance.

P.aeruginosa was the bacteria in our study that was most isolated. Although it is regarded as an opportunistic disease, it is extremely virulent and can infect any type of tissue. It can harm immunocompetent people. [4] The presence of flagella and pili, which are crucial for the pathogen's motility and adhesion, is one of many characteristics that contribute to its pathogenicity. [5] Enzymes that break down tissue proteins, such proteases and elastases, are another contributor. [6],[7]

In our study males (51.4%) were more commonly affected than females which is supported by the study performed by AHMED et al [9], in contrast with the study carried out by Loy et al [10] and Mansoor et al(ref 13). According to the research conducted adults were more affected than the children similar to the study done by balan S and Vishwanathan B [10]and against the findings of Shreshtha BL[11].

There is greater incidence of otitis media in right ear compared to the left as supported by the study of Shreshtha[11]. Since the proportion of different organism isolated varies from study to study, like in our research the most common bacteria isolated is pseudomonas aeruginosa and accordance with the study conducted by G.Jothi lakshmi,Geetha,Swarajya Lakshmi[15] also by mukund M .Vaghela[10].lakshmi and Bhaskaran[14], gulati et al [16], ayyagari et al [15]. These findings were in contrast to the study conducted by Sherbath et al [ref 11] and K mozafari et al[12] which showed staph aureus the most common causative organism.

The strongest fluoroquinolone of the first generation, ciprofloxacin has a broader spectrum of action and superior tissue penetration. They have a long post-antibiotic impact and hamper bacterial resistance

development .In our study 100 % of CONS & Proteus , 91% klebsilla ,87.5% of pseudomonas are sensitive to ciprofloxacin.

Ciprofloxacin was found to be the most effective drug followed by Amikacin, Gentamicin, Clindamycin, Ceftriaxone, in contrast to the findings of VKPoorey and Arati Iyer[17]

CONCLUSION :

A serious health issue in underdeveloped nations like India is ear infections. Early detection of the etiological agents and knowledge of their antibiotic sensitivity pattern can help reduce the occurrence of ear infections. In this study Pseudomonas aeruginosa is the most common cause of ear infection followed by klebsilla . Most of the isolates were sensitive to Ciprofloxacin.

The types of bacteria causing ear infections varies in different geographical areas and, due to the local antimicrobial prescribing practices and the prevalence of resistant bacterial strains in that area the antimicrobial resistance profile also varies accordingly. So, antimicrobial susceptibility testing should be done for all isolates to help in the deciding of drugs for treatment.

REFERENCE

1. Washun AG, Zemene Y. Bacterial profile and antimicrobial susceptibility patterns of otitis media in ayder teaching and referral hospital, Mekelle University, Northern Ethiopia. Springerplus 2015;4:701.
2. Abera B, Kibret M. Bacteriology and antimicrobial susceptibility of otitis media at desse regional health research laboratory, Ethiopia. Ethiop J Health Dev 2011;25:161-7
3. Bluestone CD, Klein JO. Otitis Media in Infants and Children. 4th ed. Hamilton, Ontario, Canada: BC Decker, Inc.; 2007
4. Lyczak JB, Cannon CL, Pier GB. Establishment of Pseudomonas aeruginosa infection: Lessons from a versatile opportunist. Microbes Infect 2000;2:1051-60.
5. Breidenstein EB, de la Fuente-Núñez C, Hancock RE. Pseudomonas aeruginosa: All roads lead to resistance. Trends Microbiol 2011;19:419-26.
6. Kerr KG, Snelling AM. Pseudomonas aeruginosa: A formidable and ever-present adversary. J Hosp Infect 2009;73:338-44.
7. Bieth JG. The elastases. J Soc Biol 2001;195:173-9.
8. G.Jothi lakshmi,Geeta,Swarajya lakshmi.Chronic Suppurative Otitis media Profile of Aerobic organisms and antibiotic sensitivity. Journal of Evolution of Medical and Dental sciences 2014;vol 3,Issue 70,December 2015page 14357-14362.
9. Ahamed A, Usman J, Hashim R. Isolates from CSOM and their antimicrobial sensitivity.
10. Balan S, Viswanatha B (2017) Microbiology of Chronic Suppurative Otitis Media: A Prospective Study in a Tertiary Care Hospital. J Otolaryngol ENT Res 9(1): 00277. DOI: 10.15406/joentr.2017.09.00277
11. Shreshtha BL, Amathya RCM, Shreshtha I, Ghosh I, Microbiological profile of Chronic Suppurative Otitis media Nepalese Journal of ENT Head and Neck Surgery, Vol .2.,No 2,Issue 2 Dec 2011.
12. MozafirNia, G Sepehri, H.Khatmi, MRShakibir. Isolation and antimicrobial susceptibility of bacteria from CSOM patients in kerman, Iran.
13. Mansoor T, Musani MA, Kamal M – Pseudomonas aerogenosa in Chronic Suppurative Otitis Media
14. Lakshmi pathi G and Bhaskaran CS – Bacteriology of CSOM.
15. Ayyagari A, Pandi SC, Goswami – Anaerobic Bacteria in Chronic Otitis Media.
16. Gulati J Tandon, Bais AS – Study of Bacterial Flora in CSOM.
17. Mukund M.Vaghela, Hiren Doshi, Sneha Rajput- Analysis of Ear Discharge and Antimicrobial sensitivity and its treatment- International Journal of Research in Medical Sciences.2016 Jul;4(7):2656-2660
18. Shenoi PM. Management of chronic suppurative otitis media. In: Scott Brown's Textbook of Otorhinolaryngology. 5th ed., Vol. 3.;CRC PRESS, INDIA 1988. p. 215