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Aerobic Bacteriology of Chronic Suppurative Otitis Media(CSOM) in A Tertiary Care Hospital in North India

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ABSTRACT:
Chronic suppurative otitis media (CSOM) is a chronic inflammation of the middle ear and mastoid cavity. Clinical features are recurrent otorrhoea through a tympanic perforation, with conductive hearing loss of varying severity. The objective of this cross sectional prospective study was to determine the microbial diversity a of aerobic bacterial isolates among the patients suffering from CSOM. Antimicrobial sensitivity testing for aerobic isolates was carried out by Modified Stokes disc diffusion method on Muller Hinton agar. Results were interpreted in accordance with central laboratory standards institute guidelines. The isolated microbial organism belonged to a myriad array with Staphylococcus aureus being the most predominant organism.(40.2%) with Pseudomonas aeruginosa being the second most common.(29.8%). Continuous and periodic evaluation of microbiological pattern and antibiotic sensitivity of isolates is necessary to decrease the potential risk of complications by early institution of appropriate treatment.
Keywords: Chronic suppurative otitis media (CSOM),Antimicrobial susceptibility, Staphylococcus,Pseudomonas

INTRODUCTION:

Chronic suppurative otitis media (CSOM) is defined as chronic inflammation of middle ear and mastoid cavity that may present with recurrent ear discharges or otorrhoea through a tympanic perforation[1]CSOM is usually classified into two types, tubotympanic and attico-antral depending on whether the disease process affects the pars tensa or pars flaccida

of the tympanic membrane. Infection can spread from middle-ear to vital structures such as mastoid, facial nerve, labyrinth, lateral sinus, meninges and brain leading to mastoid abscess, facial nerve, paralysis, deafness, lateral sinus thrombosis, meningitis and intracranial abscess[2]. Complications associated with CSOM were frequent in pre-antibiotic era, however, the introduction of antibiotics gave clinicians a tool to be used even without the precise etiological diagnosis and the irrational use of antibiotics led to the emergence of multi-drug resistant bacterial strains and disease complication in return[3]·The objective of this cross sectional prospective study was to determine the microbial diversity a of aerobic bacterial isolates among the patients suffering from CSOM.

MATERIALS AND METHODS:

A total of 77 patients clinically diagnosed of CSOM, who did not received antimicrobial therapy (topical or systemic) for the last 7 days were included in the study. Ear discharge was obtained from the diseased ear of the patient, using separate pre-sterilized swabs. The swab was used for aerobic culture and was plated on 5% sheep blood agar (BA), MacConkey's agar . The plates were incubated at 37°C for 48 h. Organisms were identified using standard procedures[4,5]. Antimicrobial sensitivity testing for aerobic isolates was carried out by Modified Stoke's disc diffusion method on Muller Hinton agar. Results were interpreted in accordance with central laboratory standards institute guidelines[6]. The following antibiotics were tested: Ciprofloxacin(5 mcg), Amoxicillin(20mcg), Gentamicin(10mcg), Ceftriaxone,(30mcg) Ceftazidime(30mcg), Cefotaxime(30mcg), Amikacin(30mcg) Imipenem(10mcg), Meropenem(10mcg) Colistin(10mcg) Polymyxin B(300U), Piperacillin Tazobactam(100/10mcg), Netilmicin(30mcg),Aztreonam(30mcg),Ciprofloxacin(5mcg),Clindamcin(2mcg),Erythromycin(15mcg) and Ofloxacin(5mcg).

RESULTS:

Of the 77 isolates a majority were found to be belonging to the age group of 11-20years (29.8%)TABLE 1.

TABLE 1:
The age distribution profiles were as follows:

Age group	Number	%
1-10	15	19.5
11-20	23	29.8
21-30	18	23.4
31-40	6	7.8
41-50	3	3.8
51-60	1	1.2

The sex distribution revealed a majority of the patients being female.TABLE 2

	Number	%
Male	22	28.6
Female	55	71.4

The isolated microbial organism belonged to a myriad array with Staphylococcus aureus being the most predominant organism.(40.2%) with Pseudomonas aeruginosa being the second most common.(29.8%).The complete profile of aerobic microbial profile was as follows: TABLE 3

Organism	Number	%
Staphylococcus aureus	31	40.2
Pseudomonas spp	23	29.8
Klebsiella spp	11	14.3
E. coli	6	7.8
Acinetobacter spp.	3	3.9
Proteus spp.	1	1.3
Streptococcus pneumoniae	1	1.3
Morganella spp.	1	1.3

The antibiotic sensitivity profile of the two most common isolates were as follows with S.aureus being most sensitive to Amikacin(93.6%sensitive)TABLE 4 and Pseudomonas aeruginosa being most sensitive to Imipenem(95.7%sensitive) TABLE 5.

TABLE 4:
Staphylococcal aureus isolates:

Antibiotic	Number of resistant strain	%
Penocilin	26	83.8
Cephalexin	6	19.4
Cephazolin	3	9.7
Erythromycin	9	29.0
Clindamycin	6	19.4
Gentamicin	12	38.7
Amikacin	2	6.4
Ofloxacin	19	61.2

TABLE 5: Pseudomonas aeruginosa isolates:

Antibiotic	Number of resistant strain	%
Gentamicin	13	56.5
Amkacin	7	30.4
Ciprofloxacin	12	52.2
Aztreonam	3	13.0
Ceftazidine	5	21.7
Piperacilin-Tazobactam	2	8.7
Imipenem	1	4.3
Meropenem	3	13

DISCUSSION:

Predominant bacterial etiology (aerobic) of CSOM in this region is *Staphylococcus aureus* (40.2%)) and this observation was in line with diversity of microbial flora of CSOM infection in colder regions as reported in studies by Ettehad, *et al[7]* from Iran (31.15%) and Singh, *et al*[8]. from India (36%). In contrast, other studies from India[9], Nigeria[10], showed different trends as Pseudomonas was the most prevalent organism and this could be due to the variation in micro-organisms in different regions and effect of climate. In our study, we could isolate Pseudomonas in 29.8% of cases. Pseudomonas, however, is the predominant cause of CSOM in tropical region does not usually inhabit the upper respiratory tract, its presence in the middle-ear cannot be ascribed to an invasion through ET and it should be considered as secondary invader gaining access to the middle-ear via defect in TM[11].
Antimicrobial susceptibility test (AST) was carried out for all the aerobic isolates. AK was found to be most effective drug for S.aureus followed by CZ. These findings were parallel to the reports by other authors [12,13].

CONCLUSION:

With the development and widespread use of antibiotics, the types of pathogenic micro-organisms and their resistance to antibiotics have changed. Continuous and periodic evaluation of microbiological pattern and antibiotic sensitivity of isolates is necessary to decrease the potential risk of complications by early institution of appropriate treatment. As higher incidence of disease was seen among children so educating parents and guardians on possible risk-factors of the disease may be a preventive strategy that might reduce disease occurrences. We believe that our data may contribute to an effective management of CSOM.

REFERENCES:

1. Acuin J. Geneva: World Health Organisation; 2004. 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; pp. 9–23.

2. Berman S. Otitis media in developing countries. Pediatrics. 1995;96:126–31.

3. Hassan O, Adeyemi A study of bacterial isolates in cases of otitis media in patients attending Oautch, Ile-Ife. Afr J Exp Microbiol. 2007;8:130–6.

4. MacFaddin J. 3rd ed. Philadelphia: Lippincott Williams and Wilkins; 1976. Biochemical Tests for Identification of Medical Bacteria.

5. . Forbes BA, Sahm DF, Weissfeld AS. 10th ed. St Louis, Misssouri, USA: Mosby Inc; 1998. Bailey and Scott's Diagnostic Microbiology.

6. Performance Standards for Antimicrobial Susceptibility Testing. Vol. 1 No. 1, M2 A9. Vol. 1. Pennsylvania, USA: Clinical and Laboratory Standard Institute; 2007. Clinical and Laboratory Standard Institute.

7. Ettehad GH, Refahi S, Nemmati A, Pirzadeh A, Daryani A. Microbial and antimicrobial susceptibility patterns from patients with chronic otitis media in Ardebil. Int J Trop Med. 2006;1:62–5

8. Singh AH, Basu R, Venkatesh A. Aerobic bacteriology of chronic suppurative otitis media in Rajahmundry. Biol Med. 2012;4:73–9.

9. Shyamla R, Reddy SP. The study of bacteriological agents of chronic suppurative otitis media–aerobic culture and evaluation. J Microbiol Biotechnol Res. 2012;2:152–62.

10. Osazuwa F, Osazuwa E, Osime C, Igharo EA, Imade PE, Lofor P, et al. Etiologic agents of otitis media in Benin city, Nigeria. N Am J Med Sci. 2011;3:95–8

11. Vishvanath S, Mukhopadhyay C, Prakash R, Pillai S, Pujary K, Pujary P. Chronic suppurative otitis media: Optimizing initial antibiotic therapy in a tertiary care setup. Indian J Otolaryngol Head Neck Surg

12. Mansoor T, Musani MA, Khalid G, Kamal M. Pseudomonas aeruginosa in chronic suppurative otitis media: Sensitivity spectrum against various antibiotics in Karachi. J Ayub Med Coll Abbottabad.2009;21:120–3

13. Gulati SK. Investigative profile in patients of chronic suppurative otitis media. Indian J Otol.1997;3:59–62