

Bacteriological and Mycological Profile of Chronic Suppurative Otitis Media**D. Bindu^{1*}, V. Dhanalakshmi²**²Professor of Microbiology, Institute of Microbiology, Madurai medical College, India¹Assistant Professor, Department of Microbiology, Sree Balaji Medical College & Hospital, Chromepet, Chennai, India**Original Research Article*****Corresponding author***D. Bindu***Article History***Received: 07.01.2018**Accepted: 17.01.2018**Published: 30.01.2018***DOI:**

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Abstract: Chronic Suppurative Otitis media is one of the major commonest Diseases in E.N.T practice. This study was designed to learn the incidence of chronic suppurative otitis media with reference to age and sex distribution among a South Indian Population. Chronic suppurative otitis media and its possible relationship with certain predisposing factors like tonsillitis, adenoiditis, sinusitis and socio economic status, etiological agent and Antibiogram has been the primary objective. Pus was collected in two cotton swabs as the pus oozing from the middle ear. One was used for smear preparation and another for cultural studies .Of all the 100 ear swabs collected all the ear swabs was found to be culture positive. Of the 100 case of chronic suppurative otitis media, the maximum incidence with regard to age was observed in the first decade of life and then gradually declined. As for sex the cases revealed that males were more commonly affected than females with Chronic Suppurative Otitis. The incidence of tonsilloadenoiditis with 35%., sinusitis (5%) and deflected nasal septum (5%) led to chronic suppurative otitis media. *Pseudomonas aeruginosa* was the leading cause of CSOM. Gentamycin, Kanamycin and streptomycin were the highly sensitive drugs.

Keywords: CSOM, Antibiogram, *Pseudomonas aeruginosa*.

INTRODUCTION

Chronic suppurative otitis media (CSOM) is defined as chronic inflammation of middle ear and mastoid cavity that may present with persistent or intermittent ear discharges through a tympanic perforation [1].

It is common in the developing and underdeveloped countries especially due to low socio-economic society, poor hygiene, overcrowding, inadequate health care, malnutrition and recurrent respiratory tract infection. Ninety percent of global burden of CSOM accounted by Southeast Asia, Western pacific regions and Africa. In India, earlier studies quoted more than 16-45%. The prevalence rate of CSOM in Tamilnadu is 6-7.8%. The poorer rural communities have highest prevalence than urban communities [2, 3]. The prevalence is common in children than in the adults.

The objective of the study is find out the incidence of CSOM with reference to age and sex distribution, CSOM and its relation with predisposing factors like tonsillitis, adenoiditis, sinusitis and socioeconomic status, microbiological profile, and sensitivity pattern.

MATERIALS AND METHODS

This community based, prospective study was conducted for a period of 6 months in a Tertiary Care Hospital of Tirunelveli, Tamilnadu. The study was

approved by our Institutional Ethical Committee and the written informed consent (signed by patient or parent/guardian) was obtained at enrollment.

A total of 100 patients clinically diagnosed of CSOM, who did not received antimicrobial therapy for the last 7 days were included in the study. Three ear Swabs was obtained from the diseased ear of the patient, using two separate pre-sterilized swabs. One of the swabs was used for aerobic culture and was plated on 5% sheep blood agar (BA), MacConkey's agar and chocolate agar (CA). The plates were incubated at 37°C for 24-48h and remaining material used for processing for tuberculosis and anaerobic culture.

Anaerobic culture was inoculated in Robertson's cooked meat (RCM) broth and incubated at 37°C for 72 h. On 3rd day, sub-cultures from RCM were made on 5% BA and Neomycin BA (Neomycin at a working concentration of 70 µg/ml). Third swab was used for mycological culture and was inoculated on two slants of Sabouraud Dextrose Agar and were then incubated at 25°C and 37°C. The slants were later

examined for gross and the microscopic morphology of the fungi.

Organisms were identified using standard procedures [4, 5]. Antimicrobial sensitivity testing for aerobic isolates was carried out by Kirby Bauer disc diffusion method on Muller Hinton agar. Results were interpreted in accordance with central laboratory standards institute guidelines [6]. All dehydrated media, reagents and antibiotic discs were procured from Hi-media Laboratories Pvt. Ltd., Mumbai, India.

RESULTS

Random study of chronic suppurative otitis media covered 28% of patients who are attending E.N.T outpatient Department of Tirunelveli Medical College. The ear swabs culture resulted in 114 isolations from 100 patients, with total bacterial incidence (93.9%) and total fungal incidence (6.1%). In the ear swabs, bacterial culture alone were recorded as 93.6%, fungal culture 3.6% and mixed culture 2.7% (bacteria and fungus). Among the bacterial culture, monobacterials were 92.7% and polybacterials was 0.9%. Among the bacterial isolates, 86% was gram negative bacteria and 14% was gram positive bacteria.

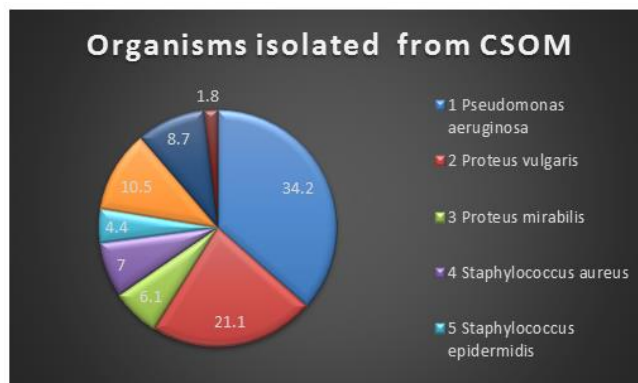


Fig-1: Frequency of various bacterial isolates in CSOM

The fungal isolates were Aspergillus niger (3.5%), Aspergillus fumigatus (0.9%), Aspergillus flavus (0.9), and candida albicans (0.9%). From the 100 CSOM cases, bilateral CSOM was observed in 10% and which on speciation showed parallel occurrence of organism with Pseudomonas aeruginosa, Proteus vulgaris and Proteus mirabilis with same sensitivity

pattern. The incidence of tuberculosis of the middle ear was found to be nil. The incidence of anaerobic organism was nil.

Of the 100 cases of CSOM the maximum incidence (26%), with regard to age was observed in the first decade of life and then gradually declined fig. 2.

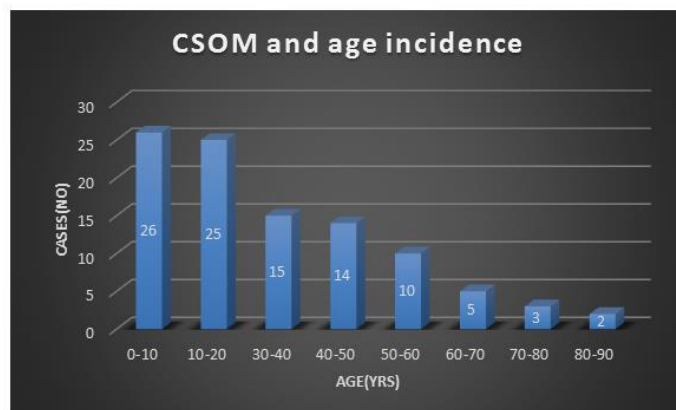


Fig-2: CSOM and age Incidence

Males were commonly affected (59%) than females (41%). Based on socioeconomic status and area of origin, the CSOM was recorded as 67% from rural area with low socioeconomic groups. The incidence of

tonsil adenoiditis with 35%, sinusitis 5% and deflected nasal septum 5% led CSOM.

Hearing loss was seen in 12% of CSOM. In 7% of CSOM cases led to suppurative complications and the organism were isolated.

Table-1: Organism isolated from complicated cases

sno	Organism	Number isolated
1	Proteus vulgaris	2
2	Proteus mirabilis	2
3	Pseudomonas aeruginosa	2
4	Staphylococcus epidermidis	1

The commonest organism isolated from nasopharyngeal area was diphtheroids, Moraxella catarrhalis, Staphylococcus epidermidis and candida

albicans. Antibiotic sensitivity pattern of various isolates is shown in the figure 3.

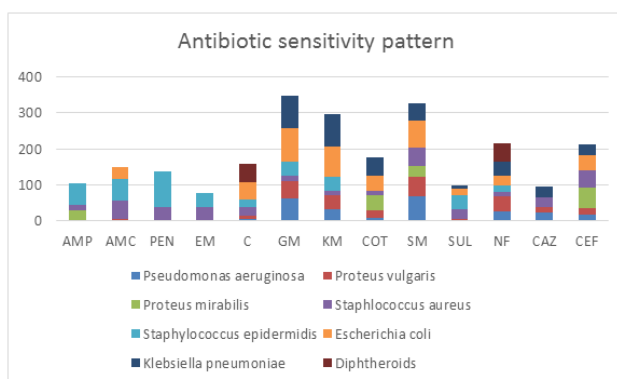


Fig-3: Antibiotic sensitivity pattern of CSOM isolates

AMP- Ampicillin, AMC- Amoxicillin, PEN- Penicillin, EM-Erythromycin, C-Chloramphenicol, GM-Gentamycin, KM- Kanamycin, COT- Cotrimoxazole, SM –sulphamide, NF-Norfloxacin, CAZ- ceftazidime, CEF-cefixime. Pseudomonas aeruginosa was sensitive to streptomycin, kanamycin and gentamycin.

DISCUSSION

Chronic suppurative otitis media (CSOM) is, defined as a chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharges or otorrhoea through a tympanic perforation[1]. There are many risk factors for CSOM. The prevalence of CSOM is more in developing countries and less in developed countries [1]. Poverty, overcrowding, inadequate housing and poor hygiene are known to contribute to high rates of CSOM [1]. In our study the CSOM was recorded as 67% from rural area with low socioeconomic groups. The study results indicate poor hygiene, low education, overcrowding has directly influence on the prevalence of CSOM.

The incidence of ear infection was highest in 1st an 2nd decade, and which is similar to the other studies [7]. Few studies suggest it is highest in the first decade [8] and in few others studies in the 2nd decade [9, 10]. The frequency of respiratory infection in this age group may be due to Eustachian tube dysfunction which leads to CSOM.

The preponderance of males was seen in our study indicating greater amount of occupational and environmental exposures [11, 12]. Pseudomonas aeruginosa was the predominant bacterial isolate in this study, which is in accordance with the other studies [13-22], but in contrast in few studies Staphylococcus aureus was the predominant organism [7]. In another study Proteus was the predominant organism.

In our study the second most common organism was Proteus vulgaris, followed E.coli, Klebsiella spp, Staphylococcus aureus, Proteus mirabilis, CONS. In Madan *et al.* study Proteus mirabilis and other studies it was Staphylococcus aureus. The bacterial etiology may vary in different geographic region from time to time, due to the different climate. No anaerobes were isolated in this study like Rangaiiah ST *et al.* study [7]. But in few studies clostridium, peptostreptococcus was isolated.

Gram negative organism accounted 86% of the total organism and gram positive organism accounted 14 %, which is similar to the Madan *et al.* study [18]. In the present study fungal isolate prevalence were 6.1 which correlate with Loy *et al.* study [17]. The isolates were Aspergillus Niger (3.5%), Aspergillus fumigatus (0.9%), Aspergillus flavus (0.9), and candida albicans (0.9%).

In the present study bilateral infection was 10%. Where as in other it was 5% by study done by nandan and Bhaskaran and Baruah & Agarwal [23, 24]. In the present study Pseudomonas aeruginosa, Proteus spp, E.coli, and Klebsiella spp was highly sensitive to streptomycin, kanamycin and gentamycin. Staphylococcus aureus highly sensitive to amoxicillin and cefixime.

CONCLUSION

In this study monomicrobial infections was common than polymicrobial infections in CSOM. This study indicates that CSOM is prevalent in low socioeconomic people, and common in first and second decade of life. Hence education of the CSOM must be given to low socioeconomic people in rural areas. Proper and timely management of the CSOM may prevent hearing loss and other complications.

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