



A STUDY ON THE INCIDENCE OF SINGAPORE EAR AMONG THE RURAL POPULATION OF CHENNAI

RAMESH VARADHARAJAN* KARTHIKA JAYAKUMAR AND KALYANI*****

* Assistant Professor - Dept. of E.N.T, Professor & HOD-Dept. of Microbiology**
Tutor - Dept. of Microbiology***

Shri Sathya Sai Medical College & Research Institute, Ammapettai,
Nellikuppam. 603108. Kancheepuram dist. Tamil Nadu,

ABSTRACT

Singapore ear or diffuse Otitis externa are common in tropical countries [1, 2 & 3]. Factors like excessive moisture in the external ear canal, local trauma and invasion by pathogens play an important role in the development of the infection [1, 4 & 5]. Our college is located in the coastal area of suburban Chennai with 72 villages around. A study was designed to analyse the incidence of Singapore ears in the rural population who use the lakes, ponds and wells for bathing. 132 patients with various ear complaints attending the ENT OPD were selected. History including bathing & ear cleaning habits were obtained. Separate swabs were taken from the infected and contra lateral ear and sent to the laboratory for culture & sensitivity studies. The patients were reviewed after 3 days. In our study 51.6% of isolates were pathogenic and unhealthy ear cleaning habits were observed in 61.4% of patients. Pseudomonas aeruginosa was the commonest [40%] organism isolated which showed a strong [100%] positive sensitivity pattern to Imipenem, Ceftazidime, Gentamycin, Amikacin, Cefotaxime, Cefaperazone and Carbenicillin. The incidence of 'Singapore ears' in our study is similar to that of the other studies. Water entry along with indiscriminate ear cleaning and infection by Pseudomonas aeruginosa were the major contributing factors. The strong positive sensitivity pattern shown by the Pseudomonas aeruginosa is of great importance to the clinicians dealing with multidrug resistant strains.

Key words: Singapore ears, Diffuse Otitis Externa, Pseudomonas aeruginosa



KARTHIKA JAYAKUMAR

Professor & HOD-Dept. of Microbiology Shri Sathya
Sai Medical College & Research Institute, Ammapettai,
Nellikuppam. 603108. Kancheepuram dist. Tamil Nadu,

*Corresponding author

INTRODUCTION

Acute diffuse Otitis externa, also known as 'Singapore Ear' is common in Tropical countries due to hot & humid weather conditions [16]. The normal microbial flora of the external auditory canal includes Staphylococcus epidermidis, Micrococci, Enterobacteriae, saprophytic mycobacteria, Corynebacterium species along with Staphylococcus aureus, and Streptococcus viridans [1, 7 & 8].

The chain of events starts with accumulation of moisture in the ext. Ear canal, either due to water entry or sweating. This in turn alters the acidic pH of the ext.ear canal [4 & 9]. Local trauma and break down of the natural defence mechanism of the skin facilitates invasion by pathogens like Pseudomonas [4 & 6].

The rural population of the 72 villages surrounding our college frequently use the natural water bodies for bathing. The habit of cleaning the ear indiscriminately and applying oil for ear cleaning is also prevalent. We decided to conduct a study in these people to analyze the incidence of ext. ear infections, identify the causative microbes and their antibiotic sensitive pattern.

MATERIAL & METHODS

This study was conducted over a period of three months. A total of 132 patients belonging to various age group and sex, attending the ENT OPD with complaints of ear pain, discharge, and itching were selected for this study.

A detailed personal history about the ear cleaning habits with cotton buds or other inanimate objects like hair pin, match sticks, quill etc was taken. Any history of bathing or swimming in natural water bodies or oil application into the ears was also noted. Presence of associated conditions like Eczema, Urticaria, Allergic Rhinitis, were noted in all cases. Patients with a history of Diabetes were not included in the study.

An informed consent was taken from all patients after explaining the importance of the test & the beneficial outcome of the test like choosing the suitable antibiotic for treatment.

Before instrumentation separate samples were taken from deeper section of the ear canal of the infected as well as contra lateral ear for control. The samples were transported to the lab using the AMIES transport medium (18) and were inoculated in MacConkey's agar, Blood agar, Chocolate agar & Sabouraud's agar as per standard protocol (19). The plates were incubated for 24-48 hrs at 37°C. The growth obtained were identified using appropriate tests as per standard format & suitable antibiotic sensitivity tests were done as per CLSI guidelines (20). The patients were prescribed ciprofloxacin ear drops & oral anti-inflammatory drugs. They were reviewed on the 3rd day with the culture & sensitivity reports. According to the sensitivity pattern the medications were changed. After completion of antibiotic therapy for 7-10 days, the patients were reviewed again. Majority of the patients recovered completely. Health education to avoid water entry was given. Those with perforated tympanic membrane were advised Tympanoplasty.

Observation

The prevalence of community acquired ext.otitis in our study was 51.6%. The male: female ratio was 6:7. The Lt.: Rt.ear ratio was 73:59. History of water entry was present in 63.6% of the patients and 62% were found to be using inanimate object to clean their ears. The use of oil as a home remedy was observed in 15.9% of patients and associated allergic conditions were present in 10.6% of patients. Of the 132 patients included in the study, 92% had Diffuse External Otitis, 5% had associated CSOM, 1% had ASOM, 1% had Furunculosis and 1% had Myringitis.

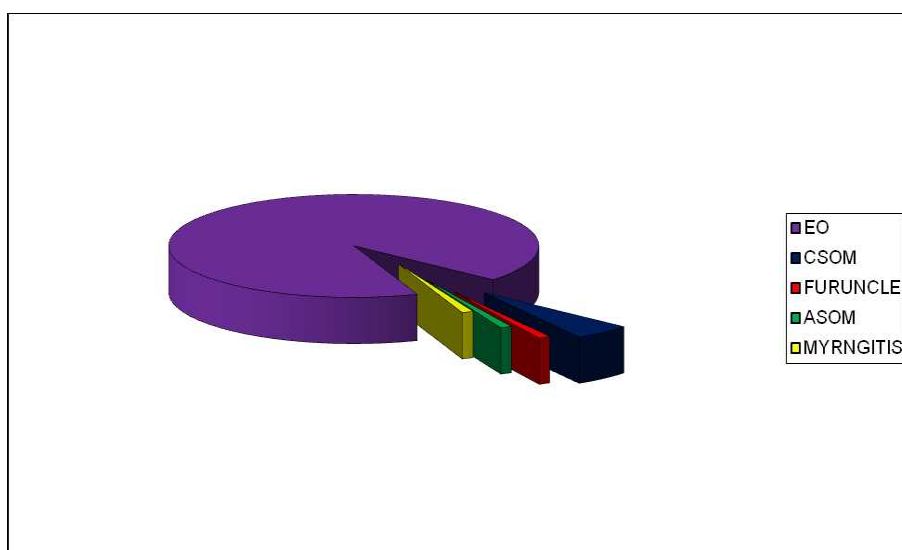


Figure 1
Distribution of various infections

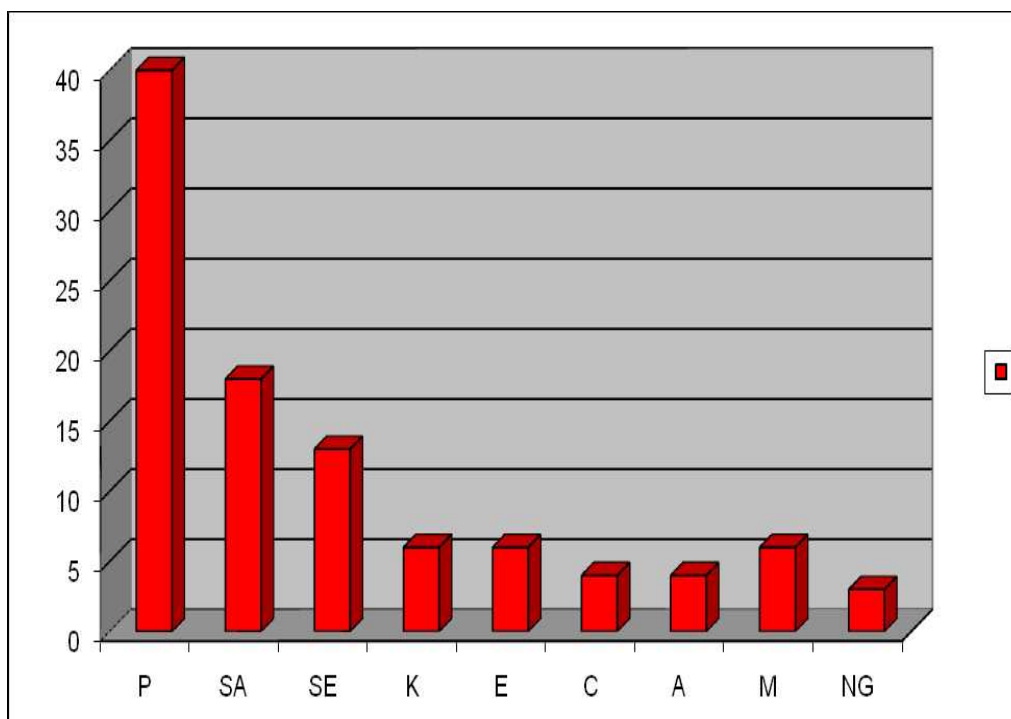


Figure: 2
Various bacteria isolated, P-Pseudomonas aeruginosa-40%, SA-Staphylococcus aureus-18%, SE-Staphylococcus epidermidis-13%, K-Klebsiella pneumoniae-6%, E- Escherichia coli-6%, C- Candida albicans-4%, A- Aspergillus niger-4%, M- Micrococci -6%, NG- No growth-3%.

The analysis of bacterial profile shows that the commonest etiological agent was *Pseudomonas* followed by *Staph.aureus* as seen in other studies done on Ext. Otitis (1&8).

The highlight of the study was the high [100%] sensitivity pattern of the *Pseudomonal* isolates to the different antibiotics like Imipenem, Ceftazidime, Gentamycin, Amikacin, Cefotaxime, Cefaperazone and Carbenicillin used in the culture studies.

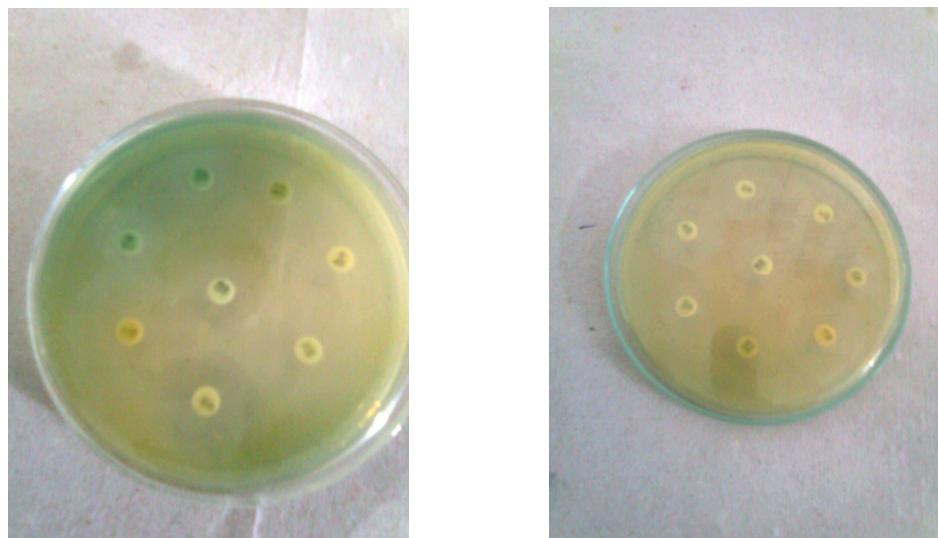


Figure: 3
Culture plates showing the sensitivity pattern of the Pseudomonas & Staph.aureus isolates.

In the current era both gram positive & gram negative bacilli exhibit multidrug resistant strains as seen in other studies (12&14). The high sensitivity pattern observed in our study is unusual and should be a promising factor for the Clinicians and microbiologists alike!

DISCUSSION

Water entry or sweating creates excessive moisture in the ear canal. Moisture causes oedema of the stratum corneum of the skin and occlusion of the apopilosebaceous unit [8]. The lipid secretions by the ceruminous glands which normally coat the squamous epithelium are lost [6]. The normal acidic pH of the ear canal changes to an alkaline one [5&9] leading to colonisation of bacteria and fungi. Subsequent cleaning of the ear causes a local trauma also. The breakage of natural defence mechanism of the skin facilitates bacterial invasion and infection (1-6, 9, 10 &11). Local allergic reaction to the pollutant

or chemicals present in the water also plays an important role [1, 2, 6 &10].

The role of water entry and ear cleaning is clearly identified in our study by 63.6% of the patients reporting water entry and 62% of patients having history of ear cleaning!

The commonest bacteria causing Diffuse Ext.Otitis as identified in other studies are *Pseudomonas aeruginosa* and *Staph. aureus* [1&8]. Analysis of the bacterial profile in our study also shows a similar result. *Pseudomonal* isolates have exhibited multidrug resistance to various antibiotics as reported in other studies [14&15]. Interestingly in our study the *Pseudomonal* isolates have shown 100% sensitivity to Imipenem, Ceftazidime, Gentamycin, Amikacin, Cefotaxime, Cefaperazone and Carbenicillin.

The second commonest bacteria isolated in our study were *Staph. aureus*. They were 100% methicillin sensitive and showed a high sensitivity pattern to oxacillin, vancomycin, linezolid, cefazoline,

erythromycin and ciprofloxacin. They exhibited only 35% resistance to Penicillin ; which is low when compared to the other studies (13). This is also unusual and in contrast to the reports of multidrug resistant strains of both gram positive & gram negative bacilli seen in other studies (15). The prevalence of such highly sensitive bacteria

in our study can be attributed to the non availability of higher antibiotics in rural area, the disproportionate doctor – patient ratio, continuation of home remedies and indigenous treatment by the rural folks.

CONCLUSION

The study reveals that swimmer's ear is commonly caused by water entry into the ears, indiscriminate ear cleaning and infection with bacteria like *Pseudomonas aeruginosa* and *Staph.aureus*. The highly sensitive nature of these infecting organisms to many antibiotics was a unique feature of the study. When clinicians are battling with several drug resistant strains which increase the morbidity of their patients, our findings should be a morale booster and a shot in the arm! We wish that such sensitivity pattern is maintained with a strict antibiotic policy & avoiding antibiotic abuse.

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