



## A DIVERSE TYPES OF MICROORGANISMS FROM OTORHINOLARYNGOLOGICAL INFECTIONS AND THEIR ANTIMICROBIAL SUSCEPTIBILITY PATTERN IN A TERTIARY CARE CENTRE HOSPITAL

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### ABSTRACT

**Introduction:** Diseases of the ear, nose and throat (ENT) contribute to significant impairment of the daily life of affected patients. It has been reported that micro-organisms were the cause of 98% cases of otitis media. Chronic nose and throat infection also a serious matter of concern. Above all, Mucormycosis is the potential cause of death in this covid pandemic. **Materials and Methods:** This is a prospective study conducted over a period of 6 months (August 2021–Jan 2022) in the Department of Microbiology, Burdwan Medical College and Hospital, West Bengal. Isolation of bacteria were performed from clinical samples obtained from patients in Dept. Of E.N.T of BMCH. Eighty four samples were collected from patients with suspected ENT infections after obtaining consent. **Result:** Bacterial growth was seen in 55 samples(65.47%), of which, Gram-positive and Gram-negative bacterial isolates were found in 31 samples(56.36%) and 21 samples(38.18%) respectively. Three gram positive bacilli (5.45%) also were grown. Fourteen samples (16.66%) were also positive for fungal growth. **Discussion:** Infectious diseases account for a big chunk of cases in Otorhinolaryngology .The main causes for this is unhygienic habits on the part of patients like pond bathing, instilling oil and other substances in Ear and Nose, improper hand washing , substance abuse and inserting unsterile ear-buds inside auditory canal. Delayed reporting for treatment and misdiagnosis along with injudicious use of antibiotics also poses a threat.

### KEYWORDS

Plasma Apheresis, medical procedure, hemapheresis, Leukocytes

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### INTRODUCTION

Diseases of the ear, nose and throat (ENT) contribute to significant impairment of the daily life of affected patients.[1]Ear, nose and throat are interconnected organs of human body and susceptible to colonisation by a wide spectrum of bacteria (pathogenic or commensal).[2] Bacterial infections of ENT constitute a large number of cases globally, causing hearing loss and learning disability particularly in children. [3]Ear infections such as chronic otitis media have serious consequences in developing countries. Otitis media, which is now known to be the most common childhood infection, leads annually to the death of over 50,000 children under 5 years. [4] It has been reported that micro-organisms were the cause of 98% cases of otitis media.[5] Chronic nose and throat infection also a serious matter of concern. Bacteria such as *Pseudomonas aeruginosa*, *Staphylococcus* spp, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Proteus mirabilis*, *Klebsiella pneumoniae* and *Escherichia coli* have been found in majority of ENT infections.[6,7] Now a days Mucormycosis poses an alarming threat specially in COVID positive cases.[8]The Global Antimicrobial Resistance Surveillance System(GLASS) has been launched in May 2015 by WHO to support a standardised approach for AMR data collection ,analysis and sharing at a global level.[9] This study was performed to detect the current trends of infection and the antibiotic susceptibility patterns for patients suffering of ENT infections in a tertiary care Medical College & Hospital.

### MATERIALS AND METHODS

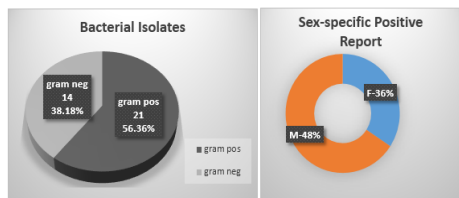
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suspected ENT infections after obtaining consent. Institutional ethical committee clearance was obtained. Samples were collected by following standard aseptic protocol. Types of samples collected –Pus/Fluid/Tissue/Swab from Ear, Nasal and Throat. Samples were immediately transferred to the Laboratory in Dept. of Microbiology, BMCH for processing. A calibrated loop was used to inoculate on Nutrient agar ,Blood Agar, MacConkey's agar, SDA and SDCA. After aerobic incubation at 37°C for 24 h, the petridishes were inspected for growth of microorganism. Colony characteristics of each type were recorded. Gram staining was done from the colonies, and based on the findings of that, identification of bacterial isolates was done by conventional biochemical tests for identification. The significant pathogens were identified by standard biochemical procedures. Inoculum for each isolate was prepared by direct colony suspension in nutrient broth, and the turbidity of the broth was adjusted to a 0.5 McFarland standard suspension, which contains approximately 1–4 × 10<sup>8</sup> colony-forming units/ ml. The Mueller-Hinton agar (MHA) plates were inoculated and then incubated at 37°C for overnight. On the next day, MHA plates were examined, the zone of inhibition was noted by measuring with a ruler held against the back of petri plate, and the sensitivity pattern of the bacterial isolates to various antibiotics was noted. Antimicrobial susceptibility testing was done for all the isolates using Kirby–Bauer disc diffusion method on Muller Hinton Agar adhering to standard CLSI guidelines. Antibiotics used were procured from Himedia laboratories, Mumbai. Some samples were processed in Phoenix (BD). Fungal cultures were processed by using conventional method.

### RESULTS

Of the total 84 case samples tested, 48 were from males and 36 from females. Bacterial growth was seen in 55 samples(65.47%), of which, Gram-positive and Gram-negative bacterial isolates were found

in 31 samples(56.36%) and 21 samples(38.18%) respectively. Three gram positive bacilli (5.45%) also were grown. Fourteen samples (16.66%) were also positive for fungal growth.



#### Bacterial isolates (55)

- Staphylococcus aureus-14
- Pseudomonas Sp.-11
- Klebsiella pneumoniae-8
- CONS-7
- Klebsiella oxytoca-5
- Arcanobacterium haemolyticum-1
- Burkholderia Sp.-1
- Proteus mirabilis- 1
- Streptococcus pyogenes 1
- Enterobacterium faecalis 2
- Enterobacterium faecium 1
- Corynebacterium diphtheriae 1
- Actinomyces Sp.2

#### Fungal Isolates (14)

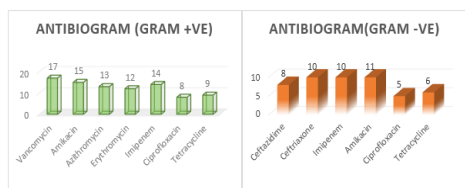
- Asperillus niger 4
- Asperillus fumigatus 2
- Asperillus flavus 1
- Penicillium sp. 1
- Sporothrix schenkei 1
- Zygomycetes 2
- Candida albicans 2
- Candida non-albicans 1

#### Distribution of Samples in ENT department

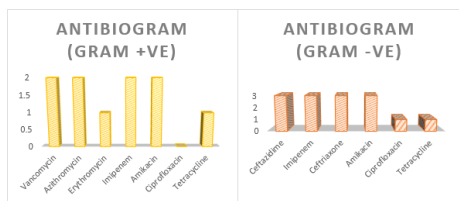
	Total	Bacterial	Fungal
Ear	39	31	8
Nose	13	9	4
Throat	17	15	2

Antibiogram of gram-positive isolates showed maximum susceptibility to Vancomycin(100%) and least to Ciprofloxacin(47%), whereas, gram-negative isolates showed maximum susceptibility to Amikacin(100%) and least to Ciprofloxacin(45%).

#### From Ear



#### From Throat



#### DISCUSSIONS

This study depicts the current scenario of E.N.T infections in patients attending BMCH and their susceptibility patterns to the commonly administered antibiotics. The commonest symptoms are discharge from ear and hearing abnormalities, accounting for 65% of the total samples. Samples collected from suspected CSOM cases reveals a high percentage of bacterial colonisation(65.47%), predominantly by gram-positive bacteria(56.36%). Bacterial isolates showed highest

colonisation by *Staphylococcus aureus* (25.45%), followed by *Pseudomonas aeruginosa* (20%), *Klebsiella pneumoniae* (14.54%). Antibiogram of gram-positive isolates showed maximum susceptibility to Vancomycin (100%), followed by and least to Ciprofloxacin (47%), whereas, gram-negative isolates showed maximum susceptibility to Amikacin (100%) and least to Ciprofloxacin (45%). Culture of swabs from nasal cavity for suspected Nasal vestibulitis showed growth of *Staphylococcus aureus* with susceptibility to all the commonly administered antibiotics. Throat swabs from suspected tonsillo-pharyngitis cases showed colonisation by *Klebsiella pneumoniae* and *Staphylococcus aureus*, with antibiotic susceptibility similar to that of isolates from ear.

Infectious diseases account for a big chunk of cases in Otorhinolaryngology. The main causes for this is unhygienic habits on the part of patients like pond bathing, instilling oil and other substances in Ear and Nose, improper hand washing before meals, substance abuse and inserting unsterile ear-buds inside auditory canal. Delayed reporting for treatment and misdiagnosis along with injudicious use of antibiotics also poses a threat.[10,11,12]

#### CONCLUSION

This study will help the microbiologist and clinicians to chart proper antimicrobial policy to combat this menace and for better prognosis of patients suffering from infections of ear, nose and throat.

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