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Research Article

An Initiative to Prevent Emergent Super Bugs in ENT Practice

Brajpal Singh Tyagi[1,2]* and Mamatarani Rout[3]

[1]*Head of Department of ENT, Colombia Asia Hospital, Ghaziabad, India*

[2]*Head of Department of ENT, Harsh ENT Hospital, Ghaziabad, India*

[3]*Junior Consultant, Department of ENT, Harsh ENT hospital, Ghaziabad, India*

***Corresponding Author:** Brajpal Singh Tyagi, Head of Department of ENT, Colombia Asia Hospital and Head of Department of ENT, Harsh ENT Hospital, Ghaziabad, India.

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Abstract

Antimicrobial resistance is now a major challenge to clinicians for treating patients. Multidrug resistance (MDR) bacteria or super bugs are one of the most important current threats to public health. Typically, MDR bacteria are associated with nosocomial infections. The spread of multidrug resistance bacteria into the community is associated with increased morbidity, mortality and health care costs. Methicillin resistance *Staphylococcus aureus* (MRSA) is the most prevalent of MDR bacteria. Others are *Pseudomonas aeruginosa, Proteus mirabilis, Streptococcus pneumoniae, Klebsiella pneumoniae* and *E. coli*. Antibiotic resistance accounts for about 70,000 deaths per year worldwide and is projected to be 10 million in 2050. It is estimated that nearly half of the people aged 15 to 24 years taken antibiotics which was not meant for them. Considering this, a study was conducted to know the pattern of causative superbugs and their antimicrobial sensitivity.

Keywords: Superbugs; MDR Bacteria; MRSA; Amies Transport Medium; Antibiotic Sensitivity

Introduction

Antibiotics are considered as the corner stone of modern medicine. The persistent irrational use of drugs, overuse and misuse of these medicines, self-medications have encouraged the emergence and spread of MDR pathogens. Every year in November (12th to 18th) world health organization (WHO) organizes World Antibiotic Awareness Week (WAAW). The aim is to increase global awareness of antibiotic resistance and also to encourage best practices among health care workers, the general public and avoid the further emergence and spread. Antibiotic resistance is associated with higher mortality, longer hospital stay, delayed recuperation, and long term disability.

In our study age group of patients ranged 0 to 80 years who presented to our out patient department with purulent discharge from clinically diagnosed ENT cases, we collected the samples for culture swab and sent to lab in appropriate medium.

Patients on antibiotics or antifungal drugs for more than 7 days before presenting to us and other immunocompromised states were excluded from the study.

After obtaining informed consent from the patients, relevant information regarding age, sex, nature of discharge, duration and any previous treatment history was noted. In our study *Pseudomonas* sp. was the predominant microorganism followed by *S. aureus*. Based on the antimicrogram pattern, *P. aeruginosa* showed sensitive to Imipenem and meropenem followed by amikacin but was found to resistant to ciprofloxacin, cefotaxime and gentamycin. The declining sensitivity trend with quinolones in our study may be due to a number of factors including easy access, injudicious use such as inappropriate dose and duration and development of enzymatic resistance by organisms. *P. aeruginosa* is known to synthesize a biofilm which is responsible for its resistance to most commonly used antibiotics and thus it is an important organism in most chronic infections. It is becoming less sensitive against commonly used antimicrobials, namely Ciprofloxacin and Gentamycin. It is most common emergent superbug.

Figure

S. aureus, the second most common pathogen in our study which showed maximum sensitivity to vancomycin, Linezolid, Amikacin and Erythromycin. Out of all Staph infections, we found 6 MRSA cases. MRSA cases were resistance to almost all drugs, which is another emergent superbug. Other isolates such as *Klebsiella* sp., Proteus mirabilis showed similar pattern of resistance [1-9].

Materials and Methods

Purulent discharge from clinically diagnosed ENT infections was collected using Microbiology culture swabs which is self-contained gel transport swab (Amies transport medium). It ensures maintenance of microorganisms without overgrowth or preservation of organisms in transit. All samples were processed in dept. of Microbiology for the identification of bacterial isolates and their antimicrobial sensitivity testing.

Results

Among 252 collected samples 118 were from ear discharge, 33 from nasal discharge, 41 from throat, 60 from other areas of head and neck. Among aerobic isolates *Pseudomonas* spp. was most common followed by *Staphylococcus aureus*. Other aerobics isolates were *Klebsiella* sp., *Proteus* sp. and *E. coli* and they were found to be sensitive to few drugs like Amikacin, Linezolid, Meropenem. And few species were resistant to almost all drugs.

Discussion

India is among the nations with the highest burden of bacterial infections. The Indian Network For surveillance of Antimicrobial Resistance (INSAR) reported MRSA prevalence rate of 41% based on data from 15 tertiary care centers and also showed a high rate of resistance to ciprofloxacin, cotrimoxazole, erythromycin and clindamycin.

Conclusion

Microbial isolates especially *P. aeruginosa* and *Staphylococcus* sp. were found to be most common pathogens in our study. Therefore, evaluation of microbiological pattern and there antibiotic sensitivity pattern helps us to prescribe empiric antibiotics and prevent the emergence of MDR pathogens or the super bugs.

It can be concluded that as a responsible health care providers we should aware of the emergent superbugs or Multidrug resistance microbes. Measures to control spread of emergent superbugs:

1. Each health care facility should have an antimicrobial use programme. The goal is to ensure effective economical prescribing to minimize the selection of resistant microorganisms.
2. Formulation of guidelines with a multidisciplinary approach using the local antibiogram.
3. Provide ongoing education on rational use of antibiotics to clinicians and ensure implementation of antibiotic policies.
4. Restricted antibiotic use.
5. Use must be justifiable based on clinical diagnosis.
6. Before initiating antibiotic treatment, appropriate specimens for bacteriological examination must be submitted to laboratory and selection of an antibiotic must be based on the sensitivity pattern, patient tolerance, and cost.
7. An agent with as narrow a spectrum as possible should be used with appropriate dosage and duration of antimicrobial therapy.
8. The correct dose must be used.
9. Control antibiotic use - Selected antibiotics may be restricted in use.
10. Standard and contact precautions including rigorous adherence to hand hygiene.
11. Proper sterilization and disinfection.
12. Surveillance for Multidrug resistant organisms or superbugs especially in high risk areas.
13. Isolation and cohorting of patients infected or colonized with Multi-drug resistant organisms (MDROs) or superbugs.
14. Increased environmental cleaning.

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