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"PREVALENCE OF NON-FERMENTERS IN PATIENTS OF URINARY TRACT INFECTION IN A TERTIARY CARE HOSPITAL , RAMA MEDICAL COLLEGE AND HOSPITAL KANPUR''

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Introduction

Urinary tract infections (UTI) are the second most common bacterial infections affecting humans throughout their lifetime. They are frequent cause of morbidity in outpatients as well as most frequent cause of nosocomial infection in many hospitals . Escherichia coli is the commonest urinary pathogen accounting for over 80% of community-acquired infection. Far less commonly Klebsiella spp, Proteus spp and Staphylococcus saprophyticus are responsible for community-acquired infection. The distribution of urinary pathogens in hospitalized patients is different with Escherichia coli accounting for about 50% of infections. Enterococcus, Klebsiella, Enterobacter, Citrobacter, Serratia, Pseudomonas aeruginosa, Providencia, and Staphylococcus epidermidis account for most of the rest.

Non-fermentative gram negative bacteria (NFGNB) are a taxonomically diverse group of aerobic, non-sporing, bacilli that either incapable of utilizing carbohydrates as a source of energy or degrade them via oxidative rather than fermentative pathway. This group includes organisms from diverse genera like Pseudomonas, Acinetobacter, Alcaligenes, Flavobacter, Oligella, Flavimonas, Agrobacter Weeksiella, etc. These organisms are common inhabitants of soil and water. They also exist as harmless parasites on the mucus membranes of humans and animals. NFGNB are known to account for about 15% of all bacterial isolates from a clinical microbiology laboratory. It has been noted that the non-fermenter gram negative bacilli are being increasingly isolated in significant bacteriuria cases in routine urinary microbiology over the years indicating their potential in causing urinary tract infections.

Nonfermenters are now resistant to many routinely used antibiotics and even to cephalosporins and carbapenems. Resistance compromises treatment, prolongs hospital stay, increases mortality and healthcare costs.The aim of the present study was to isolate and identify NFGNB from clinical samples and to know the prevalence of nonfermenters in UTI along with their and antibiotic susceptibility

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profiles in a Rama Hospital And Research Center.

MATERIAL AND METHODS

This was a cross-sectional study conducted in the Department of Microbiology from December 2023 - November 2024 at Rama Medical College Hospital and Research Centre Kanpur. Lab investigation were done at Microbiology department for Urine sample from suspected cases of urinary tract infection of both genders and of all age groups

INCLUSION CRITERIA

Urine sample from suspected cases of urinary tract infection of both genders and of all age groups will be included in this study.

EXCLUSION CRITERIA

Patient already on antibiotic therapy.
Patient present with features other than UTI.

Mid stream urine (MSU) specimens collected from both inpatients and outpatients attending Rama Hospital Kanpur for routine culture and sensitivity test were included in this study.
These MSU specimens were studied for significant bactereuria by grams staining and culturing on blood agar and MacConkey agar and CLED agar according to Kass concept .
The various specimens collected from hospitalized patients (suspected with infections) were processed for isolation and identifcation of NFGNB .
The identifcation of signifcant NFGNB isolates that are associated with infections were performed following standard microbiological techniques which involve the morphological appearance of the colonies, Gram's staining and motility test .
They were further proceeded for species identification by standard biochemical tests which include oxidase test, sugar fermentation test including triple sugar test (TSI TEST).
In-vitro antibiotic sensitivity test was performed by Kirby Bauer's disc diffusion method using Muller Hinton Agar as per Clinical Laboratory Standards Institute (CLSI) guidelines and susceptibility pattern was noted. In this study, we have included only the non-fermenters causing UTI.
First and second line antibiotics used for oxidase positive non-fermenters were Gentamicin (10 µg), Tobramycin (10 µg), Netilmycin (30 µg), Amikacin (30 µg), Ciprofloxacin (5 µg) , Ceftazidime & Piperacillin (100 µ g), where as for oxidase negative non-fermenters Gentamycin(10 µg), Netilmycin(30 µg), Amikacin(30 µ g), Norfloxacin (10µg), Ampicillin (10 µg), Amoxicillin-clavulanic acid(10 µg), Cefuroxime(30 µg) & Cefotaxime(30 µg)

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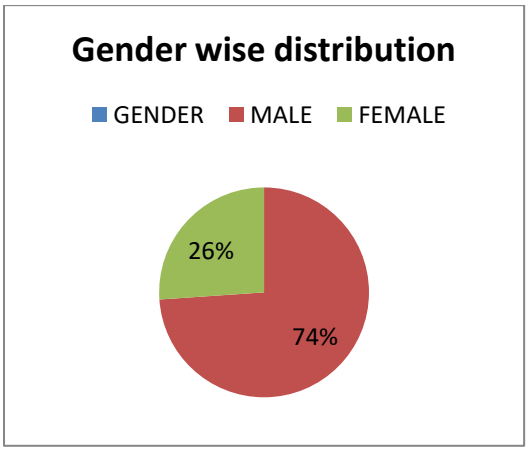
DISCUSSION

Nonfermentative gram-negative bacilli are ubiquitous in environment. They used to be considered as contaminants or commensals in the past. They have now emerged as important healthcare-associated and opportunistic pathogens due to their frequent isolation from clinical materials and their association with various diseases. In the present study, the isolation rate of NFGNB from clinical samples was 12.63%. This was parallel to the results of a study from Kolkata by Rit K et al, where NFGNB were isolated in 12.18% of clinical samples.

However, the prevalence of nonfermenters varies greatly from time to time and place to place. A study from Amritsar reported a very high isolation rate of 45.9% whereas, it was 3.58% in a study from Bangalore and 5.2% in another study from Chennai.

RESULTS

Among 200 urine sample which were collected, 182 sample had shown significant bacteriuria where as 18 were seen to be non significant growth. Among 182 positive clinical samples 23 we were found to be non fermentative. All these non-fermenters were found to be Pseudomonas aeruginosa. Most of the patients infected by Pseudomonas were male (74%) and seen among 20 to 40 yrs of age. Polymyxin B and Colistin are most sensitive antibiotics (100% sensitive) followed by Piperacillin / tazobactam (91.3% sensitive) and Meropenem (60.8% sensitive). Levofloxacin, Ofloxacin, Norfloxacin showed 74.2% , 74.8%, 74% resistant respectively. 12 Pseudomonas (52.1%) were MDR strains.



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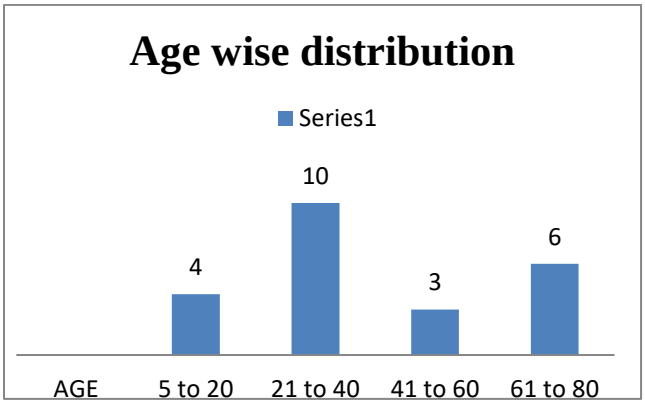

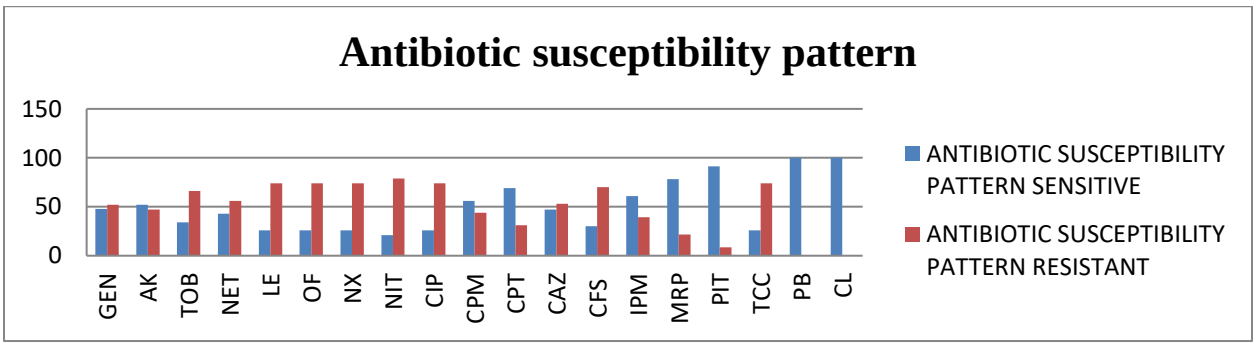

CONCLUSION

Among all the non-fermenters Pseudomonas aeruginosa were isolated in our study. High percentage of MDR isolated from urine samples is worrisome. these organisms have great potential to survive in hospital environment, To control the spread of drug resistance, appropriate lab detection, and judicious use of antibiotics should be done.

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