

Clinical and Microbiological Profile of Urinary tract infection in Chronic Kidney Disease Population in a tertiary care hospital in western Odisha

Pradhan L, Kerketta A

Department of Microbiology, VSS Institute of Medical Sciences and Research, Burla, Odisha, India.

Date of Submission: 15-12-2020

Date of Acceptance: 25-12-2020

ABSTRACT: Purpose: Chronic diseases present a major challenge to 21st century global health policy. Population aging and lifestyle modifiable risk factors have resulted in the emergence of chronic diseases. In developing countries too, chronic diseases most importantly chronic kidney disease has brought a major global health threat. Urinary tract infection (UTI) are a major public health problem in terms of morbidity and financial cost in Chronic Kidney Disease (CKD) patients in India. The resistance pattern of community acquired uropathogens in CKD patients is very important. The knowledge of microbiological profile and antimicrobial susceptibility of uropathogens is essential to formulate empirical antibiotic therapy.

Methods: Urine samples were collected aseptically, cultured and identified according to standard microbiological protocols. Antibiotic sensitivity testing was done by Kirby-Bauer disk diffusion method according to CLSI guidelines.

Results: During the one year study period from Nov 2019 to Oct 2020, a total of 130 CKD patients samples with positive urine culture were evaluated. Out of 130 samples 98 were males and 32 were females. 121 patients (93%) had gram negative infection, 5 patients (3.8%) had gram positive infection and 4 patients (3%) had Candida infection. *Escherichia coli* (62.3%) was the most common uropathogen found in my study in all age groups. Out of 130 patients, UTI was most common in elderly males in 60-70 years age group.

Conclusion: Though studies on clinical and microbiological profile of UTI in CKD population is limited, the knowledge of uropathogen not only prevent the progress of disease but will help in antibiotic stewardship and prevent multidrug resistance.

Keywords: Chronic Kidney Disease, Urinary tract infection, multidrug resistant

Disease burden in the 21st century has significantly shifted towards chronic diseases.¹ In developing countries like India, the prevalence of chronic diseases such as chronic kidney disease has severe implications on health and economic output.¹ Chronic kidney disease is a chronic inflammatory state where there is gradual loss of kidney function decrease in immunity and increase risk of infection.² CKD patients are more susceptible to infections.² CKD patients with diabetes and hypertension are even more prone to infections.³ The clinical presentation and microbiological profile of UTI may vary depending upon staging of CKD.⁴ UTI is the 2nd most common cause of community acquired infection.⁵ Despite an increasing population of patients with chronic renal insufficiency, the management of UTI in these patients is rare.^{5,6} Antimicrobial treatment of UTI requires adequate serum, renal, parenchymal and urine concentration of drugs with antibacterial activity versus the etiological organism.^{6,7,8} Hence the knowledge of microbiological profile helps us to follow empirical use of antibiotics and prevent development of antibiotic resistance in the community.

II. MATERIALS AND METHODS

The present study was carried out in the Department of Microbiology in a tertiary care hospital in western Odisha. In the study period (NOV 2019-OCT 2020) 130 samples from CKD patients from Department of Nephrology were processed and evaluated during the course of routine diagnostic work. A cross sectional study of 130 CKD patients was conducted in VIMSAR, Burla. Inclusion criteria included both outpatients and inpatients.

Inclusion criteria:

1. Patients > 16 years (males and females)

I. INTRODUCTION

2. Patients with positive urine culture
3. Patients with symptoms of UTI like burning urination, frequency or urgency of urination, abdomen or loin pain and fever
4. Patients with CKD

Exclusion criteria:

1. Patients with prior antibiotic therapy
2. Patients with immunosuppressive medication
3. Patients on dialysis therapy
4. Patients on renal transplantation.

Clean catch midstream urine was collected in a wide mouth sterile universal container. Urine samples were collected aseptically and cultured within 2 hours on to CLED medium by semiquantitative method and incubated overnight at 37°C. Antibiotic susceptibility test was performed using Kirby Bauer disc diffusion method according to CLSI guidelines.

III. RESULTS

A total of 130 CKD patient samples with positive urine culture of our hospital was evaluated. Out of 130 positive urine culture obtained, 98 were males and 32 were females. 121 patients (93%) had gram negative infection, 5 patients (3.8%) had gram positive infection and 4 patients (3%) had Candida infection. 81 patients had Escherichia coli (62.3%) as the most common uropathogen in all age groups followed by Klebsiella species (13.8%). UTI in CKD patients was most common in elderly males in our study. Out of 130 CKD patients, 35 patients (26.9%) fall in 60 to 70 years age group. Gram negative bacteria were resistant to ceftriaxone and cotimoxazole and were sensitive to amikacin, phosphomycin and nitrofurantoin. Gram positive bacteria were resistant to amoxycylav and sensitive to linezolid. All Candida were sensitive to Fluconazole.

Tables and Charts TABLE 1

GRAM NEGATIVE	
Escherichia coli	81
Klebsiella species	18
Pseudomonas species	8
Citrobacter species	5
Non fermentors	3
Serratia	3
Proteus	2

TABLE 2

GRAM POSITIVE	
Enterococcus species	4
Staphylococcus aureus	2

TABLE 3

CANDIDA	
C.albicans	2
C.non albicans	2

TABLE 4(AGE DISTRIBUTION OF PATIENTS)

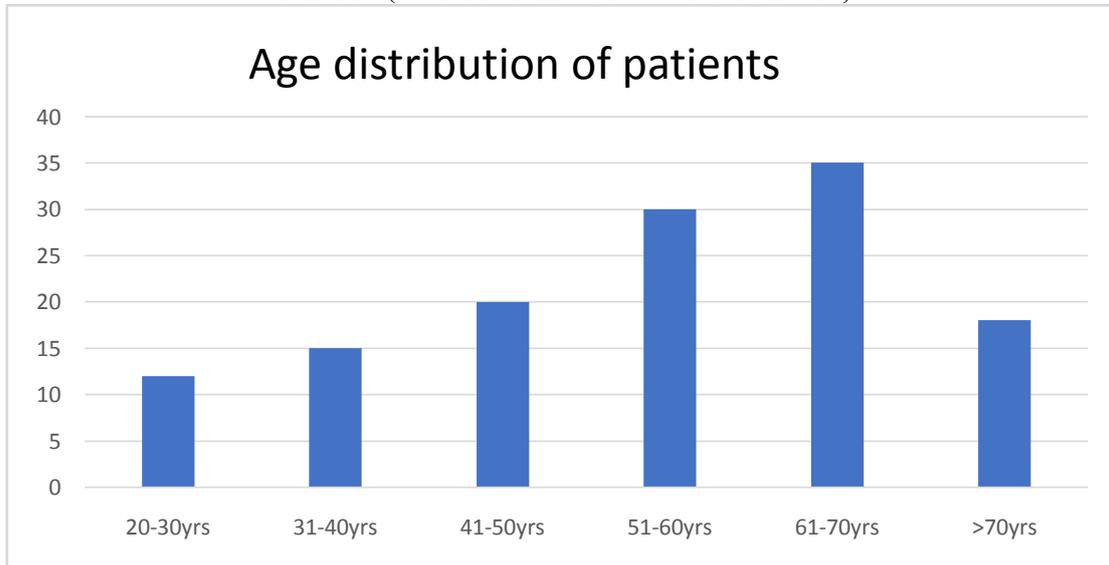


TABLE 5(GENDER DISTRIBUTION OF PATIENTS)

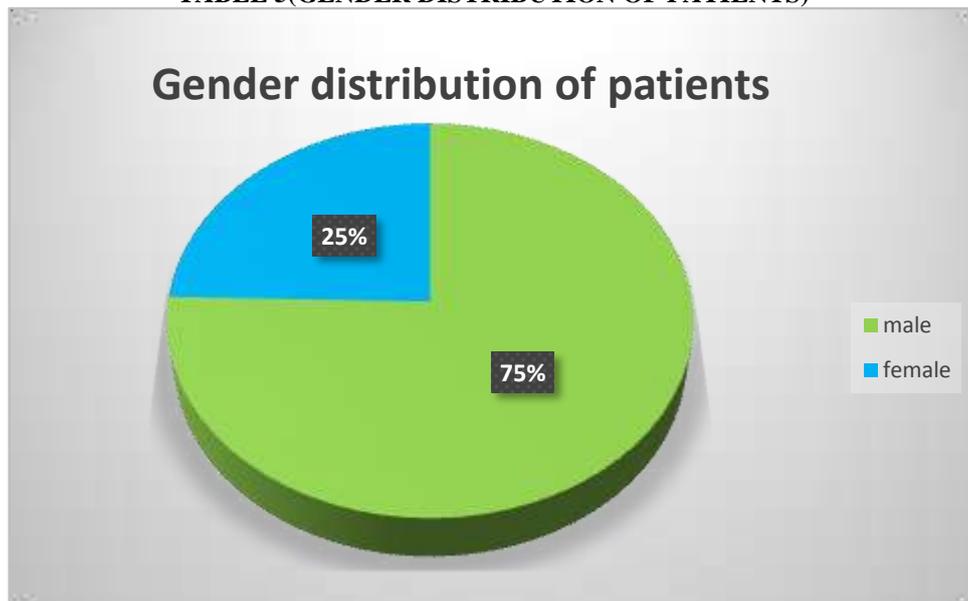
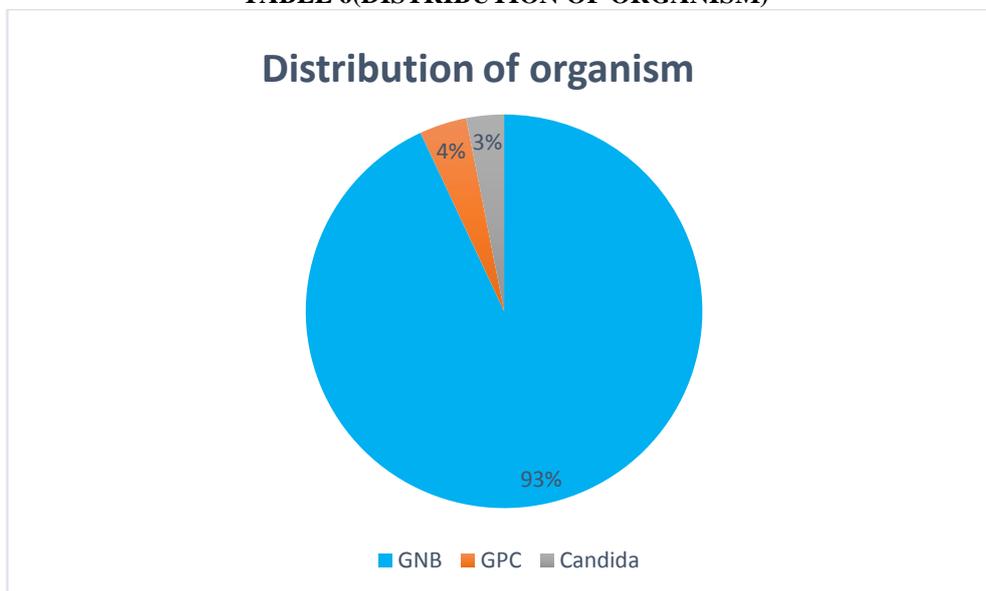


TABLE 6(DISTRIBUTION OF ORGANISM)



IV. DISCUSSION

In our study UTI in CKD was most common in elderly males. Usually females are more affected to UTI than males. But here males are more affected due to increased incidence of CKD in males as compared to females.² UTI in CKD was most common in elderly males and out of 130 CKD patients 35(26.9%) fall in 60-70 years age group which is very similar to study conducted by Mythri Shankar et al.² Among 130 CKD patients 98 were males and 32 were females which is very similar to study conducted by Mehrdad Payandeh et al.^{6,7,8} Out of 130 positive urine culture obtained, 121 were gram negative bacteria (93%), 5 were gram positive bacteria (3.8%), and 4 were Candida (3%) which is nearly 15% higher than study conducted by Chaudhary Richa et al.^{6,7,8} Escherichia coli (62.3%) was the most common uropathogen isolated in all age groups which is 6% higher as compared to study conducted by Silvana Fiorante et al.^{6,7,8} In our study Gram negative were resistant to Ceftriaxone and Cotrimoxazole and sensitive to Nitrofurantoin and Amikacin. Similarly Gram positive were sensitive to Linezolid and resistant to Amoxycyclin and all Candida were sensitive to Fluconazole.

V. CONCLUSION

Not usually but in most cases UTI can be treated successfully without causing kidney damage. UTI caused by problems like enlarged prostate gland or a kidney stone can lead to kidney damage. UTI in young children associated with high fevers may cause kidney damage. UTI in CKD

patients can cause severe damage and may progress the disease depending upon the staging of the disease. As there are limited studies on clinical and microbiological profile of UTI in CKD population, the knowledge of uropathogen not only prevent the progress of the disease but helps in antibiotic stewardship and prevent multidrug resistance.

VI. ACKNOWLEDGEMENT

The authors express their deep gratitude to the Professor and HOD department of microbiology of the institute for providing laboratory facilities, continuous guidance and constant encouragement during the study period. The authors also express special appreciation to the technical staff of the institute for providing necessary helping hand during the endeavor.

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