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Original Research Article

Identification of Candida Species among Renal Transplanted Recipient, In Khartoum, Sudan 2021

Hadeel AM.NR[1*], Hagir O.G[1], AbdelhakamH.Ali[1,2], Mosab Nouraldein Mohammed Hamad[3]

[1]Department of Microbiology, Faculty of Medical Laboratory Science, SudanInternational University, Sudan
[2]Department of Microbiology, Faculty of Medical Laboratory Science, University of Al Butana, Sudan
[3]Head of Parasitology Department, College of Health and Allied Sciences, St. Joseph University in Tanzania, Boko, Dar Es Salaam, Tanzania .

***Corresponding Author:** Hadeel AM.NR
Department of Microbiology, Faculty of Medical Laboratory Science, SudanInternational University, Sudan

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Abstract: ***Background:*** Kidney transplantation represents the optimal therapeutic tool for patients affected by end-stage renal disease (ESRD), Candidiasis is a major challenge among renal transplant recipients (RTRs) worldwide and is associated with high morbidity and mortality rates. Fluconazole is the most commonly used agent for Candida infections ***Aim:*** to identify Candida spp from renal transplanted patients**.** ***Method:*** cross sectional study were done, 51 Urine sample was collected on sterile urine container then cultured on Sabouraud dextrose agar, incubated at 35 °C and observed daily for 7 days. When the growth of yeast colonies was observed, the Gram stain method was done to verify the absence of bacterial contamination. The yeasts were identified via germ tube test and chromogenic media to differentiate between candida spp**.** ***Results:*** out of 51 patients; female were more than male wit mean age group 45 years for both male and female.The cause of ESRD was; 19 (37.3%) had DM, 12(23.5%) had hypertension, 10(19.6%) had Glomerulonephritis and 3(5.9%) had kidney stone candida species among study group as follow; c.albicans isolated from 28 (54.9%) pt., c.glabrata isolated from 11 (21.6%) pt., c.tropicalis isolated from 6 (11.8%) pt., c.krusie isolated from 3 (5.9%) of pt. and 3(5.9%) had mixed infection. C.albicans, tropicalis and C.krusie had been distributed more among DM groups and less among kidney stone groups, on the other hand C.glabrata more isolated among Glomerulonephritis groups. There was no association between candida species and ESRD. ***Conclusion:*** There was no relation between candida spp and cause of ERD**S.**

Keywords: Renal transplantation, End stage renal diseases (ESRDS), Diabetesmellitus (DM), Candida species**.**

INTRODUCTION

The renal system is comprised of 2 kidneys, 2 ureters, a urinary bladder, and a urethra. The kidneys are paired, bean-shaped (in most mammals), excretory organs that lie in the retroperitoneum and are situated in the posterior part of the abdomen on each side of the vertebral column. The right kidney is lower than the left kidney. Kidneys weight varies with body surface area, age, and sex, and both kidneys weigh approximately 0.51% to 1.08% (a mean of 0.65%) of the body weight [1, 2]. The primary functions of kidneys are (1) maintenance and regulation of body's fluid and electrolytes, (2) maintenance of extracellular fluid volume, (3) endocrine such as elaboration of hormones, (4) regulation of blood pH and pressure, (5) excretion of the waste products of metabolism, and (6) metabolic activities [3]. Kidney transplantation represents the optimal therapeutic tool for patients affected by end-stage renal disease (ESRD). Improvements in immunosuppressive therapy have resulted in a decrease in acute rejections (AR) and have significantly increased graft short-term half-life.However; late kidney graft loss remains a major problem and challenge in kidney transplantation [4]. Urinary tract infection (UTI) is the most common type of bacterial infection contracted by recipients of renal allografts in the post-transplantation period. Fungi and viruses can also cause UTIs, but infections caused by these

organisms are less common than those caused by bacteria. Both the lower and upper urinary tract (encompassing grafted or native kidneys) can be affected [5]. *Candida* species are common colonizers of the human skin, vagina, and the gut. As human commensals, *Candida* species do not cause any notable damage in healthy individuals; however, in certain conditions they can initiate a wide range of diseases such as chronic disseminated candidiasis, endocarditis, vaginitis, meningitis, and endophthalmitis. The incidence of *Candida* caused infections has increased worldwide, with mortality rates exceeding 70% in certain patient populations. *C. albicans*, *C. glabrata*, *C. tropicalis*, *C. parapsilosis*, and *C. krusei* are responsible for more than 90% of *Candida*-related infections [7]. Candidiasis is a major challenge among renal transplant recipients (RTRs) worldwide and is associated with high morbidity and mortality rates. Fluconazole is the most commonly used agent for *Candida* infections [6].

MATERIAL & METHOD

Cross sectional study was carried out in Dr. Salma dialysis center, was including 200 renal transplant recipient attended to this center during period of three month (February to May at 2021). Urine sample was collected on sterile urine container then cultured on Sabouraud dextrose agar, incubated at 35 °C and observed daily for 7 days. When the growth of yeast colonies was observed, the Gram stainmethod was done to verify the absence of bacterial contamination [8]. The yeasts were identified via germ tube test and chromogenic media to differentiate between candida spp.

Proper specimen collection, transportation and storage were done for good quality of result. Proper sterlization, culture processing for sample was done to obtain good result. Standard precautions designed to prevent contamination during processing.

Statistical analysis was performed using SPSS version 20 (Statistical Package for the Social Sciences). And the result will be presented through various graphic and tabulated modules. In addition, special statistical test like chi-square was performed to illustrate and clarify the contribution of candida in renal transplantation patients.

Before conducting study the proposal of the study was ethically approved by ethical committee of sudan International University and Ministry of Health. Then informed consent from patients and permission from the general managers of hospital.

RESULT

51 patients suffering from Urinary tract infection with candida specie, 32 (63%) of them were female and 19 (37%) were male (figure1). Age of cases ranged between 20 years and 70 years old and with mean age 45 years for both male and female (figure2). The cause of ESRD was; 19 (37.3%) had DM, 12(23.5%) had hypertension, 10(19.6%) had Glomerulonephritis and 3(5.9%) had kidney stone (figure 3)..Isolation of candida species among study group as follow; c.albicans isolated from 28 (54.9%) pt., c. glabrata isolated from 11 (21.6%) pt., c. tropicalis isolated from 6 (11.8%) pt., c.krusie isolated from 3 (5.9%) of pt. and 3(5.9%) had mixed infection (figure 4). C. albicans, tropicalis and C. krusie had been distributed more among DM groups and less among kidney stone groups, on the other hand C. glabrata more isolated among Glomerulonephritis groups. There was no association between candida species and ESRD (p.value 0.6) (table1).

Fig-1: Distribution of study population according to gender

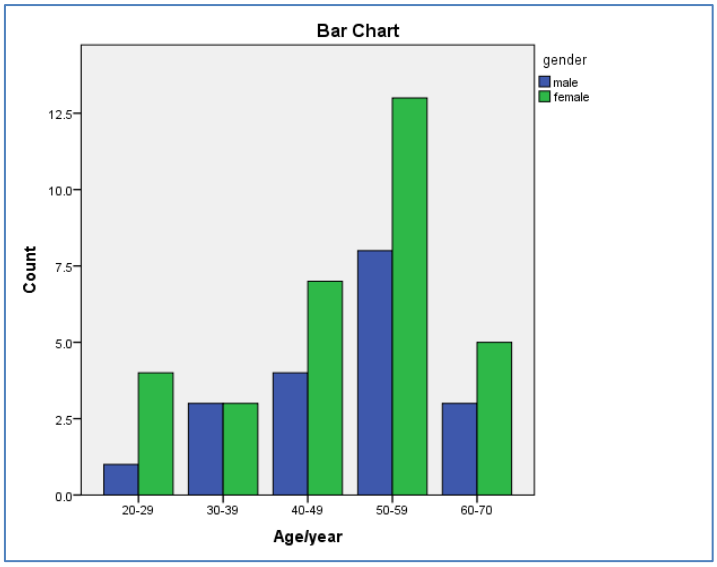

Fig-2: Distribution of study population according to age

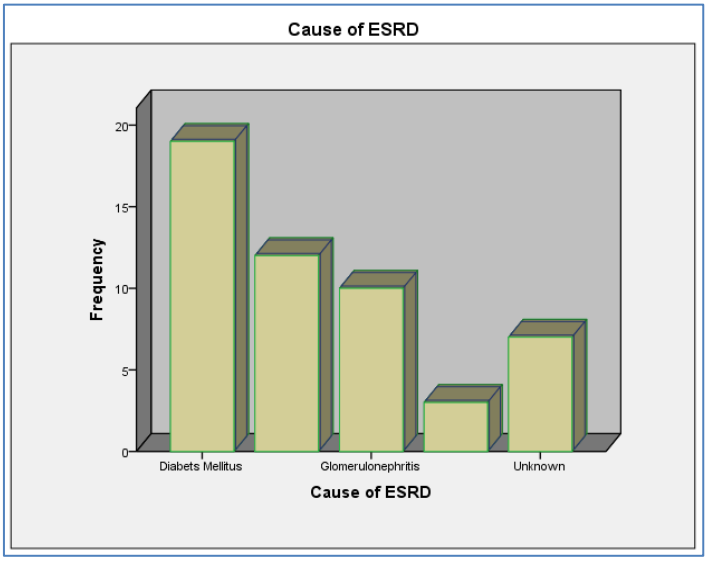

Fig-3: Causes of ESRD

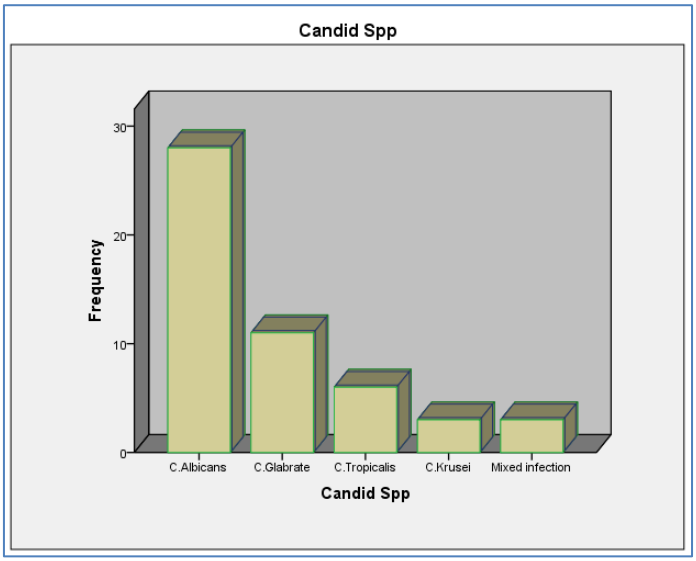

Fig-4: Candida Spp

Table-1: Correlation between candida spp and cause of ESRD

		Candid Spp					Total	P. value
		C. Albicans	C. Glabrate	C. Tropicalis	C. Krusei	Mixed infection		
Cause of ESRD	Diabets Mellitus	12	2	2	1	2	19	
	Hypertension	8	2	1	0	1	12	
	Glomerulonephritis	4	4	1	1	0	10	
	Kidney stone	1	1	0	1	0	3	
	Unknown	3	2	2	0	0	7	0.6
Total		28	11	6	3	3	51	

DISCUSSION

The result of these study agree withKambizDiba (2018) which conclude that A total of 41 *Candida* isolates, including *C. albicans* (n = 18), *C. famata* (n = 8), *C. kefyr* (n = 4), *C. tropicalis* (n = 4), *C. parapsilosis* (n = 3), *C. glabrata* (n = 2), and *C. lusitaniae* (n = 2), were isolated from 32.5% (41/126) renal transplant recipients. Fluconazole-resistance was observed in seven isolates, entailing *C. albicans* (n = 6) and *C. tropicalis* (n = 1) [6]. But completely disagree withMazhar Hussein Amirali (2020) which showed that Sporotrichosis is a rare fungal infection; among these patients, it occurs mostly in renal transplant patients [9].

Also our study agree withZahraaKadhum Al-Mussawi (2019) which showed that the infection rate in females was (65.38%) and males (34.62%), the infection was more common in the age groups (21-29) years old. Cultural characteristic and biochemical criteria revealed that (41.30%) of isolates were C. albicans, which is more prominent followed by C. parapsilosis(27.17%), C. tropicalis (19.56%) and C. krusei (11.95) [10]. And partially agree with S.Zafar (2020) which concludes that From 74 kidney stone patients, 77 isolates of Candida spp. were confirmed through standard microbiological and molecular characterization. C. albicans was the predominant species with 51 isolates (66.2%) followed by 26 (33.8%) of C. non-albicans [11]. And completely disagree withYun-Xia Chen (2019) which concluded that the most common infection site was the urinary tract (90 infections; 56%), both overall and in the repeated infection group. The most frequently isolated pathogen was Pseudomonas aeruginosa. In the repeated infection patients, in most cases of P. aeruginosa infection (54%) it was cultured from urine [12].

CONCLUSION

Our study revealed that most relevant cause of ESRD was diabetes melites, C.albicns had been more isolated from renal transplanted patients suffering from UTI and there was no relation between candida spp and cause of ERDS

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