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Case Report

Internal Medicine Section

A Case Report on Post-haemodialysis Pyrexia Caused due to a Rare Species of *Trichosporon*

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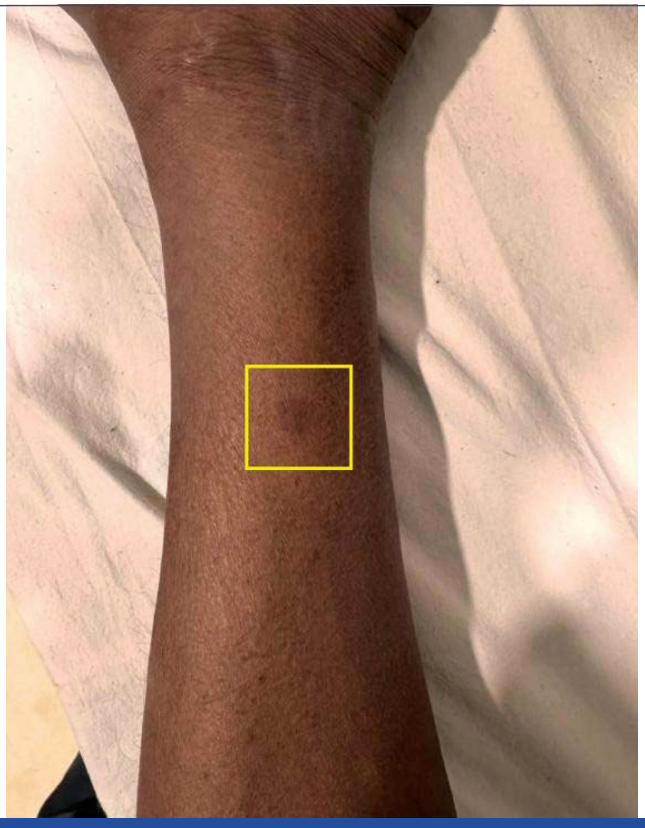
ABSTRACT

Hypertension is a global health threat, which, in coexistence with chronic kidney disease, increases the associated health risks. Most of the vulnerable patients receive prophylactic therapeutic intervention for fungal infections, though, in a few instances, there is a delay in symptomatic presentation. The patients with hypertension and chronic kidney disease receiving haemodialysis should be monitored strictly for the same. This is a case of a 41-year-old male infected with *Trichosporon* infection with a positive history of hypertension and chronic kidney disease, receiving haemodialysis treatment. The patient was timely confirmed to have the diagnosis and successfully managed with the systemic antifungal drug Itraconazole {100 mg (BD) for 14 days} and Fluoroquinolones {500 mg (OD) for seven days}. A follow-up at one month showed the patient with laboratory markers within normal limits.

Keywords: Chronic kidney disease, Immunosuppressed, Microbial infections, Post-transplant infections, *Trichosporonosis*, *Trichosporon* species

CASE REPORT

A 41-year-old male presented at the outpatient department with complaints of breathlessness and bilateral pedal oedema. There was a history of hypertension for three years and Chronic Kidney Disease (CKD), indicating end-stage renal disease for the past nine months. The vitals on admission were noted as a pulse of 108/minute, a respiratory rate of 20/minute, and a blood pressure of 170/100 mmHg. The patient underwent haemodialysis for the same. Two cycles of haemodialysis were completed uneventfully, and the patient was noted to be doing well. However, after the third cycle, rashes developed all over his body [Table/Fig-1] with fever spikes. Laboratory parameters were noted as mentioned in [Table/Fig-2].



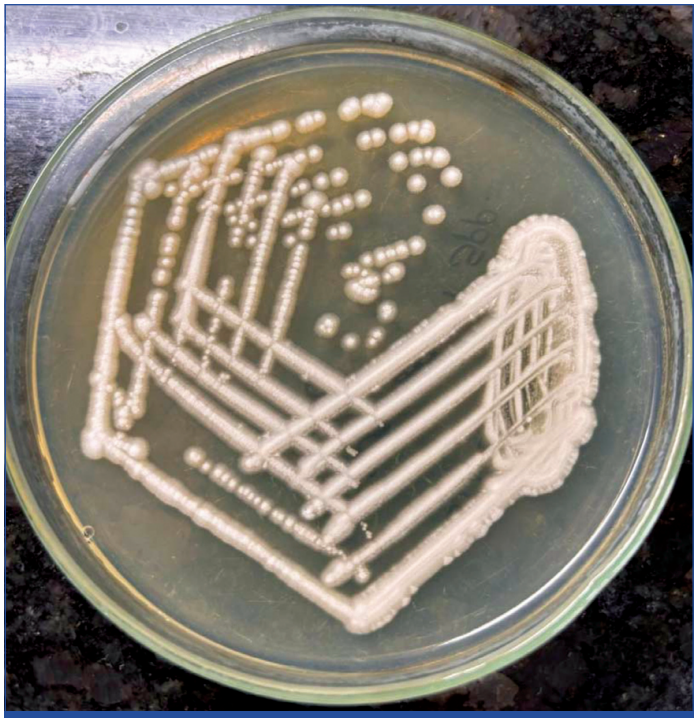
[Table/Fig-1]: Clinical image depicts the papulomacular rash over the forearm.

Variables	Patient value	Normal value
Haemoglobin (g/dL)	7.7	13.2 to 16.6
MCHC (g/dL)	34.2	32 to 36
MCV (fL)	94.9	80 - 100
MCH (pg/cell)	32.4	27 to 33
Total RBC count (million/mcL)	2.38	4.7 to 6.1
Total WBC count (cells/µL)	7300	4000-11000
Total platelet count (lacs/µL)	1.8	1.5-4.5
Haematocrit	22.6%	41-50%
Monocytes	4%	2-8%
Granulocytes	70%	41.5-50.4%
Lymphocytes	25%	20-40%
Eosinophils	1%	0-7%
Basophils	0%	0-1%
Red cell distribution width	15.6%	12-15%
Urea (mg/dL)	180	9-20
Creatinine (mg/dL)	11	0.66-1.25
Sodium (mmol/L)	142	137-145
Potassium (mmol/L)	5.8	3.5-5.1

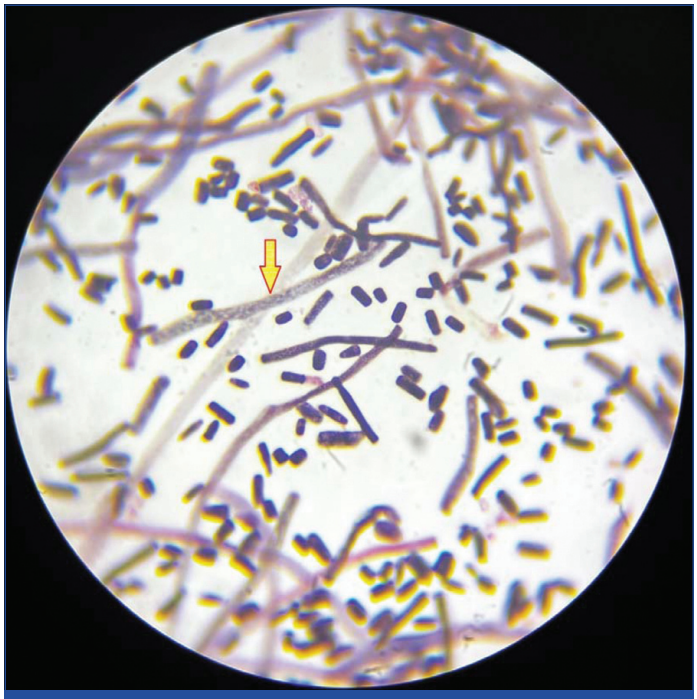
[Table/Fig-2]: Laboratory parameters of the patient on admission. MCHC: Mean corpuscular haemoglobin concentration; MCV: Mean corpuscular volume; MCH: Mean corpuscular haemoglobin; RBC: Red blood cell; WBC: White blood cell.

The blood samples were collected in duplicates in BacT culture bottles and processed using the BACTEC system. One of the two samples was found to be positive. After flagging positive, the sample from the BACTEC bottle was cultured on Sabouraud dextrose agar for the isolation of *Trichosporon* spp. Gram staining of the colony revealed Gram-positive budding yeast cells with barrel-shaped arthroconidia, confirming *Trichosporon* spp. [Table/Fig-3,4]. Follow-up cultures were not sent; the patient showed full clinical recovery and laboratory normalisation by 15 days.

In this case, the provisional diagnosis was pyrexia of unknown origin post-haemodialysis. Based on positive blood culture findings and morphological identification, the final diagnosis was confirmed as *Trichosporonosis*. The identification was confirmed by morphology due to instrumentation limitations; VITEK or Matrix-assisted laser



[Table/Fig-3]: Culture plate showing the growth of Trichosporon spp. on Sabouraud dextrose agar media.



[Table/Fig-4]: Microscopic image (100x) represents the Gram-positive budding yeast cell with barrel-shaped arthroconidia.

desorption ionization–time of flight mass spectrometry (MALDI–TOF MS) was not available at the time.

Antifungal susceptibility testing was not performed due to logistical constraints. Itraconazole was selected based on the standard sensitivity of *Trichosporon* spp. The patient was managed with the systemic antifungal agent Itraconazole (100 mg twice daily for 14 days) along with fluoroquinolones (Ciprofloxacin 500 mg once daily for 7 days) as the patient developed fever and rash post-haemodialysis, which are systemic signs of infection attributed to the secondary Gram-negative bacteraemia, which is a known complication in CKD patients undergoing dialysis. A follow-up was conducted after 15 days, during which the patient showed symptomatic improvement.

DISCUSSION

Trichosporon species are emerging opportunistic pathogens, posing a serious health threat in patients with invasive medical devices such as indwelling catheters, haematology issues, CKD, end-stage renal disease, and other ailments [1,2]. This patient developed *Trichosporon* infection following haemodialysis with a dialysis catheter placed in the internal jugular vein, consistent with the clinical findings described in the case series reported by Hassan H et al., [2]. *Trichosporon* species can be observed growing on the skin, gastrointestinal tract, and respiratory tract in humans. *Trichosporon* infections are commonly associated with superficial sites but might be invasive in patients with haematological issues such as lymphoma, leukaemia, and other systemic infections [3,4]. *Trichosporonosis* can also be a serious health threat in immunocompromised patients post-transplant and CKD patients. In patients with hypertension, dialysis, and CKD, *Trichosporonosis* infection should be considered as a differential diagnosis attributed to the associated clinical threat. Clinicians should also be vigilant in patients with invasive medical devices such as a Foley catheter [1,2].

Invasive *Trichosporon* infection can be an additional clinical threat in terms of posing a diagnostic and therapeutic challenge when drug resistance is noted. It can result in treatment failure and adverse outcomes [5]. *Trichosporonosis* is a common threat to CKD patients. CKD patients may develop fatal fungaemia with severe consequences if the infection is invasive. *Trichosporon* species have emerged as opportunistic fungal pathogens capable of causing invasive infections, particularly among individuals with haematological malignancies, recipients of bone marrow or organ transplants, extensive burns, Human Immunodeficiency Virus (HIV) infection, and those undergoing peritoneal dialysis or other invasive medical procedures [6]. This can also be observed in this case, wherein the patient developed the infection after two cycles of haemodialysis in view of his end-stage renal disease. Mortality rates of *Trichosporon* infection in the immunocompromised subset have been reported in a range of 42-90% [7]. There are around 16 different strains causing infections in humans [8]. *Trichosporon* species are classically observed as creamy white colonies on Sabouraud dextrose agar, often showing cerebriform surfaces with radial fissures [8,9].

Trichosporonosis exhibits a wide range of clinical presentations, varying from superficial, self-limited skin infections to severe, life-threatening invasive disease that might disseminate to multiple organs in immunocompromised patients [8-10]. Invasive *trichosporonosis* often presents with persistent fever unresponsive to broad-spectrum antibacterial treatments, accompanied by systemic signs such as fungal sepsis and shock. Patients may also develop cutaneous manifestations, respiratory symptoms including pneumonia, eye involvement like chorioretinitis, and renal impairment. The disease progression can be rapid and is associated with high morbidity and mortality, especially in vulnerable host populations [10]. *Trichosporonosis* is a serious threat in CKD and end-stage renal disease patients, as noted in this case. The patient underwent two cycles of dialysis uneventfully and was diagnosed with a *Trichosporonosis* during the third cycle, which was managed successfully by antifungal treatment with the antifungal tablet Itraconazole 100 mg twice a day for 14 days, and fluoroquinolone 500 mg once a day for 7 days. Itraconazole was selected based on the standard sensitivity of *Trichosporon* spp., and Fluoroquinolone was added empirically to cover possible gram-negative organisms due to systemic signs. A comparative analysis of the clinical presentation, treatment, and outcomes has been described in [Table/Fig-5] [2,6,10]. The patient developed systemic signs of infection (fever and rash post-haemodialysis), where secondary gram-negative bacteraemia is a known risk in CKD patients undergoing dialysis with vascular access. Hence, Ciprofloxacin (500 mg OD for 7 days) was initiated empirically to cover potential gram-negative bacterial infections alongside itraconazole, which was targeted against the confirmed *Trichosporon* spp. infection. There is a need for clinicians to have *Trichosporonosis* as a differential diagnosis in

patients undergoing organ transplant, haemodialysis, and those with compromised immune systems. Though prophylactic antifungal and voriconazole therapy can help control the infection, a delay in diagnosis can result in adverse events [2,10]. This is a case report of a male in his early 40s who was a known case of hypertension, who was later diagnosed with CKD/end-stage renal disease and encountered *Trichosporon* spp. infection during dialysis. The patient was successfully managed with systemic antifungal drug Itraconazole and fluoroquinolones. Repeat blood cultures were not sent as the patient showed full clinical recovery, and laboratory tests were reported normal on the 15th day. The patient was discharged with advice for one monthly follow-up for six months.

Author/ Year	Clinical setting	Treatment	Outcome
Sah R et al., 2019 [10]	Liver-kidney transplant recipient	Voriconazole	Survived
Yang MF et al., 2014 [6]	Kidney transplant with pneumonia	Caspofungin (ineffective)	Fatal
Hassan H et al., 2024 [2]	CKD patients on dialysis	Voriconazole	All recovered
Present Case	CKD on dialysis	Itraconazole+ Ciprofloxacin	Recovered

[Table/Fig-5]: Comparative analysis of published Trichosporon infection reports [2,6,10].

CONCLUSION

Trichosporon infection can be threatening and might bear adverse outcomes if not timely diagnosed and treated. Although most of the susceptible patients' subsets are on prophylactic antifungal medications, due to emerging drug resistance, *Trichosporonosis* can be a serious threat; hence, additional research on this pathogen and its drug resistance profile is needed.

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