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Letter to the Editor

An unusual infection of *Trichosporon asahii* in a COVID-19 patient with diabetes: A rare case report unveiling novel insights highlighting diagnostic challenges and clinical implications

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Dear editor,

Trichosporon asahii is a non-candidate opportunistic fungus that can be life-threatening in immunocompromised patients and individuals with underlying diseases [1]. The use of catheters, broad-spectrum antibiotics, and prolonged hospitalization, especially in the ICU are facilitating the infection with this opportunistic fungus [1–3]. SARS-CoV-2 can be easily transmitted and infected the indivituals [4]. According to reports of urinary tract infection with *T. asahii* in patients with diabetes mellitus and a history of COVID-19, considering this fungus as a potential opportunistic pathogen in the mentioned individuals is essential [2,5].

A 74-year-old man with a past medical history of diabetes mellitus, hypertension, ischemic heart disease, and cerebrovascular accident with loss of consciousness presented in a somnolent state to the emergency room, and a Foley catheter was inserted on the first day of hospitalization. He was on levebel, metformin, aspirin, losartan and had been vaccinated and boosted twice for COVID-19. He presented hypoxic with an oxygen saturation of 80 %, and the patient was intubated. The brain computed tomography (CT) scan showed moderate senile cortical atrophy and ventricular widening with moderate bilateral periventricular and centrum semi-ovale hypodensity in favor of old small vessel changes, no intracranial hemorrhage (ICH) is seen. Chest CT scan showed atelectatic changes are seen at RML and lingual subpleural reticular and ground glass opacities are seen at both lower lobes. The treatment with levebel, insulin NPH, an epinephrine drip, hydrocortisone, empiric antibiotic therapy with meropenem, and vancomycin, in response to suspected sepsis and healthcare-associated pneumonia was started.

Complete blood count (CBC) showed leukocytes 18,490 cells per μL with a 93 % neutrophil counts. The C-reactive protein (CRP) was 80 mg/L. The cerebrospinal fluid analysis and urine analysis were normal.

Day 5, the patient suffered hypoxia. A smear and culture of endotracheal aspirate were requested. The chest CT scan was repeated, in comparison with the previous exam there was some air space and ground glass nodular opacity at the right lung as a new finding in favor of aspiration and viral infectious process. The Realtime PCR test was done and the positive result for SARS-CoV-2 was confirmed. Day 8, in endotracheal aspirate culture, carbapenemase producer carbapenem-resistant *Klebsiella pneumoniae* was reported. As a result, colistin was replaced to the patient's drug regimen. Day 17, mucoid yeast-like fungi were reported in the urine sample based on microscopic observations and colony morphology on the blood agar medium. Budding yeast cells were visible on microscopic examination, and colonies on the blood agar medium were small, dried, white, and wrinkled. Day 18, the patient developed a fever again. Blood culture, urine analysis and urine culture were done and mucoid yeast-like fungi were reported from urine again. Day 22, urine analysis was active, and mucoid yeast-like fungi were reported in urine culture for the third time. The indwelling catheter was changed and voriconazole as first-line therapy for fungal infections was added to the patient's drug regimen. A 14-day course of colistin was completed. Day 23, The patient is still febrile. Isolation of mucoid yeast-like fungi from the urine sample was continued. Amphotericin B-deoxycholate was added to his medical treatment. Day 26, repetition in mucoid yeast-like fungi detection in consecutive samples led us to determine exactly the fungal agent. Colonies were identified by the Vitek2 compact automated system (bioMeriux) as *T. asahii*. this result was confirmed by the molecular method (PCR). The results of the antimicrobial susceptibility test (AST) showed that it was resistant to amphotericin B, fluconazole, intermediated to voriconazole, and susceptible dose-dependent to itraconazole. Treatment with amphotericin was stopped. The results proved that using itraconazole to continue the treatment could be helpful, but due to our country's limitation and shortage of the drug at that time, it was not possible to use a more suitable drug. On the 30th and 45th days, *T. asahii* was still reported and unfortunately, the patient expired on day 45 of hospitalization.

This report focuses on the issue although resistance to antifungal drugs has been acquired, but timely diagnosis of *T. asahii* infections, and the correct and appropriate relations between the patient's treating service, the infectious disease physician, and the microbiology laboratory can prevent irreparable consequences. Further research is necessary to strengthen clinical approaches for the diagnosis and management of

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this pathogen.

CRediT authorship contribution statement

Zahra Jahani: Writing – review & editing, Investigation, Conceptualization, Writing – original draft, Data curation. **Zohre Baseri:** Writing – review & editing, Investigation, Data curation, Conceptualization. **Amin Dehghan:** Writing – review & editing, Writing – original draft, Software, Project administration, Data curation, Conceptualization, Investigation.

Declaration of competing interest

All of the authors declare that there are no commercial, personal, political, or any other potential conflicting interests related to the submitted manuscript.

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