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Bir Covid-19 Hastasında Hayatı Tehdit Eden Nadir Bir Mantar Enfeksiyonu

A rare life threatening fungal infection in a COVID-19 patient.

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ÖZ

Bu olgu sunumunda COVID-19 hastasında Trichosporon asahii'nin neden olduğu ve invaziv/yayılmış Trichosporonosis olarak bilinen bir mantar enfeksiyonu vakası bildirilmiştir. MEDLINE Veritabanı, Google Akademik ve PubMed taramalarına göre bu olgu Suudi Arabistan'da bir COVID-19 hastasında bildirilen ilk vakadır. Bu hastada diyabetes mellitus, kronik böbrek hastalığı, uzun süreli entübasyon, santral yol/diyaliz kateteri, arteriyel damar yolu, nazogastrik tüp ihtiyacı, antibiyotikler, kortikosteroidler, kardiyovasküler hastalık ve son olarak COVID-19'un kendisi dâhil olmak üzere birden fazla risk faktörü mevcuttu. Antifungal tedavi başlanmasına rağmen olgunun kliniği kötüleşmeye devam etti ve çoklu organ yetmezliği gelişerek mortalite ile sonlandı.
Anahtar kelimeler: COVID-19 virüs, invaziv fungal enfeksiyonlar, trikosporon

ABSTRACT

I am reporting a case of an emerging fungal infection, known as invasive/disseminated Trichosporonosis, caused by Trichosporon asahii, in a COVID-19 patient. After MEDLINE Database, Google Scholar, and PubMed search, I found this to be the first case reported in Saudi Arabia, in a COVID-19 patient. This patient had multiple risk factors, including diabetes mellitus, chronic kidney disease, prolonged intubation, central line/dialysis catheter, an arterial line, need for nasogastric tubes, antibiotics, corticosteroids, cardiovascular disease, last but not the least, COVID-19 itself. This patient continued to deteriorate, despite being on antifungal medications, and developed multi-organ failure, leading to mortality.
Keywords: COVID-19 virus, nvasive fungal Infections, trichosporon

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Introduction

COVID-19 (SARS-CoV-2), is a potentially serious infection, involving not just the lungs, but multi-organ involvement, due to severe inflammatory response (1). The emergence of this fungal infection, ever since its first detection, has been identified, as a serious life threatening infection to human life. This may be related to multiple risk factors in these patients, and a baseline immunocompromised state (2).

Case History

A 70 years old patient, with history of multiple comorbid- ities, including diabetes mellitus, hypertension, chronic kidney disease (CKD) with a baseline creatinine of 1.8, ischemic heart disease with percutaneous coronary intervention (PCI), permanent pacemaker, gall stones

Recent history of positive COVID-19 polymerase chain reaction (PCR) done outside (Figure 1).

On day 1, patient was brought to our emergency room, with complain of difficulty in breathing and abdominal distension for 3 days. Prior to admission, patient had sought medical advice, in a private hospital for dysuria, decrease UOP for 3 days, found to have higher creatinine, leukocytosis, discharged home on intravenous (iv) antibiotics.

Patient was conscious, alert, hemodynamically stable, with mild tachypnea, on oxygen via nasal cannula, 2 litres/ min, oxygen saturation was 80%, on room air, by pulse oxime- ter. He was admitted to the ward with acute on chronic kidney disease.

Table 1: Laboratory

Hemoglobin	7.8 gm/dl	Sodium	133mmol/L
Platelets	38	Potassium	3.7mmol/L
WBC	25	Creatinine	3.9mg/dl
INR	1.4	Bilirubin	2.4mg/dl
PTT	53 secs	ALT	23U/L
Peripheral blood smear	No Schistocytes	Alkaline Phosphatase	147U/L
Random Cortisol	46mcg/dl	Ascitic fluid	Transudate, WBC 25, No growth
HIV test	Negative	Urine	WBC >100, RBC1-2
Hepatitis Screen	Negative	Septic Screen	Blood stream trichosporon
COVID-19 PCR	Positive		

2D Echocardiogram: showed ejection fraction more than 55. Severely dilated right ventricle (RV), RV systolic pressure 60- 65mmHg with preserved left ventricle (LV) function. Mild pericardial effusion, with no evidence of tamponade.

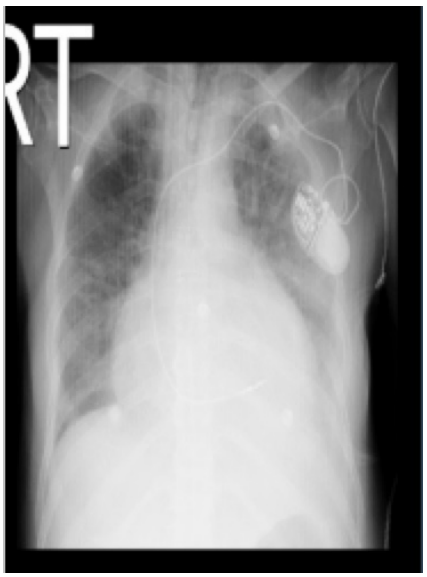

Figure 1: Chest radiograph: Cardiomegaly with a pacemaker. Bilateral ground glass appearance, consistent with airspace disease including infection. Right internal jugular central line in place.

In ultrasound hepatobiliary, average sized gall bladder with multiple stones are noted. No wall thickening or pericholecystic fluid collection. No signs of acute cholecystitis. In urinary ultrasound, there were no obstructive uropathy and the brain tomography was define as unremarkable

On day 2, patient was evaluated by Nephrology initiated on targeted fluid therapy, Human albumin, Piperacillin/ Tazobactam, Vancomycin, followed by diuretic challenge and Furosemide infusion.

Ultrasound abdomen with guided paracentesis performed. After 1 liter fluid removal, patient developed hypo- tension; intensitive care unit (ICU) consulted

On day 3, patient transferred to ICU, continuous renal replacement therapy (CRRT) was initiated. Infectious disease consultation was done and antibiotics were escalated to meropenem plus vancomycin. Favipiravir was started after 48 hours, when the COVID-19 PCR which was sent on day 1 came back positive. Spontaneous bacterial peritonitis work up was negative. Pacemaker was evaluated by Cardiology.Norepinephrine was started and fixed dose Vasopressin was added along with hydrocortisone, for septic shock. Septic screen was sent. Multidrug Resistant Organism (MDRO) screen was negative.

On day 4, patient became delirious and agitated. Oxygen requirement increased to High Flow Nasal Cannula (HFNC). Dexamethasone and Colistin were added.

On day 5, patients Glaskow Score dropped to 6/15, was subsequently intubated and ventilated. A computed tomography (CT) brain without contrast was unremarkable. All cultures came negative.

On days 6 and 7, patient developed spikes of fever (38.9 C0) with worsening coagulopathy with DIC. All lines including central line, dialysis catheter and arterial line were changed. Septic screen was repeated. A CT scan chest (high resolution) was planned to further assess his pulmonary status. However, due to unstable condition, being on high dose vasopressors, it was unsafe to transfer for CT.

On days 8 and 9, patient deteriorated, with increasing vasopressor requirements. Repeated septic screen identified a non candida yeast, Trichosporon asahii in the peripheral blood and dialysis catheter. Voriconazole and Amphotericin B were added to treatment.

On day 10, patient continued to get worse with worsening multi organ failure, severe pancytopenia and refractory shock. And finally, on day 11, patient expired (Figure 2).

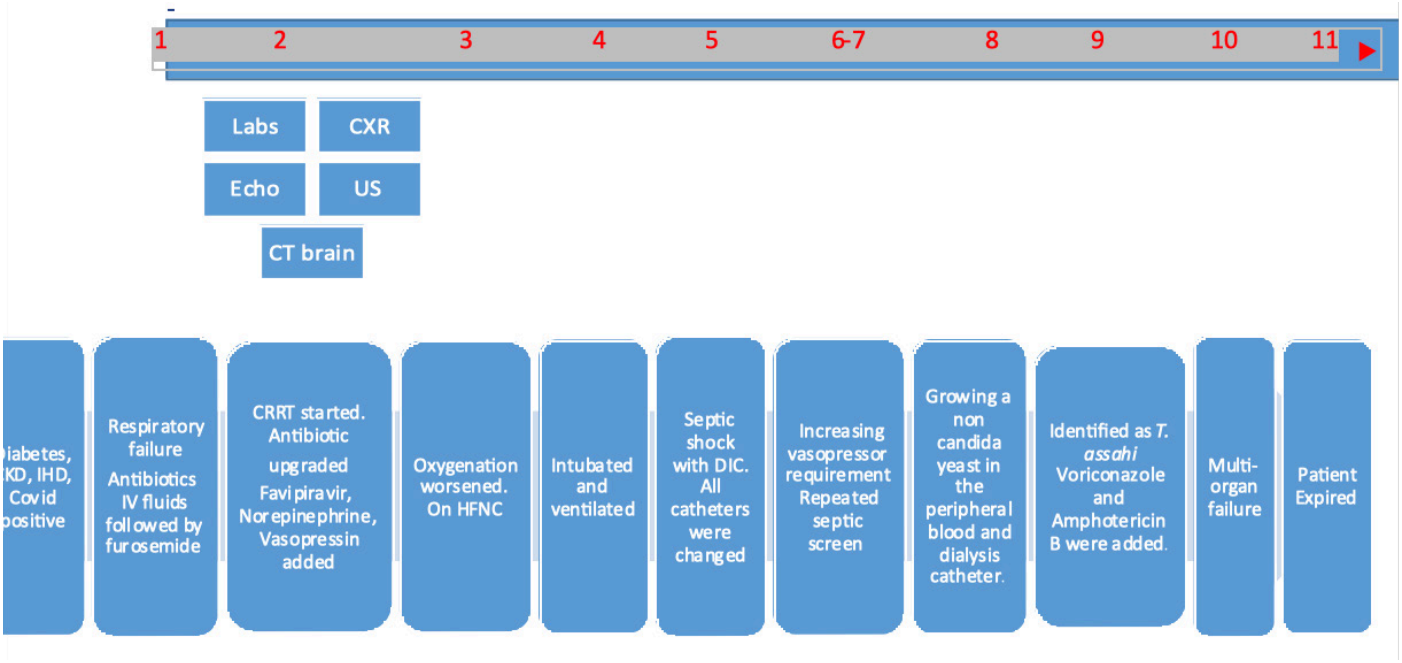

Figure 2: Timeline (days) of the case.

Discussion

Trichosporon spp. are non-candida yeasts with septate hyphae and anthroconidia (Figure 3). They belong to the basidio- mycetes division of fungus. They do not have any tele- morphic states.

They are commonly distributed in nature. Commonly isolated from soil and other environmental sources. Trichosporon is also found in the human skin, gut and respiratory tracts. At least 9 species have been detected, of which, Trichosporin Asahii is the most common pathogenic fungus causing invasive disease. The genus was first described by a German dermatologist, Gustav Behrend in 1870 as a hair infection. However, it was first described in the literature, as a cause of invasive disease in 1970 (3).

It has 2 types, Superficial and Invasive.The invasive infection known as Disseminated Trichosporonosis, which occurs most often as an opportunistic infection has a mortality rate between 40% and 80%. The disseminated infection has a tendency to involve lungs, skin, urinary tract, kidney and other organs which makes it difficult, to make a clinical diagnosis. A high index of suspicion is required.
Risk factors: (4,5)

Invasive trichosporonosis has several risk factors, both immunocompetent immunocompromised. Neutropenia is the most important risk factor in hematological malignancies. In diabetes mellitus, hyperglycemia is associated with impaired leucocyte function, which provides a favorable environment for the growth of trichosporon spp.

The broad spectrum antibiotics kill the bacteria at the pathogenic site of Infection, so the yeast gets a chance to proliferate. Corticosteroids and chemotherapeutic agents are also important medications, which can increase the risk of opportunistic infection. In hemochromatosis, the iron overload provides an environment for fungal growth. Invasive trichosporonosis has also been reported in immuno-competent patients with prosthetic valves, intravascular devices and urinary and peritoneal dialysis catheters.

Trichsporonosis has also been reported in severe burn and cystic fibrosis patients.

Treatment is challenging, with triazoles especially voriconа- zole and posaconazole are considered, as drugs of first choice. Voriconazole appears to have better in vitro activity than amphotericin B. The echinocandins caspofungin and micafungin are not efficacious against trichosporon, when used alone. Combination therapy should be consid eredas the best option for disseminated Trichosporonosis. (6,7,8)

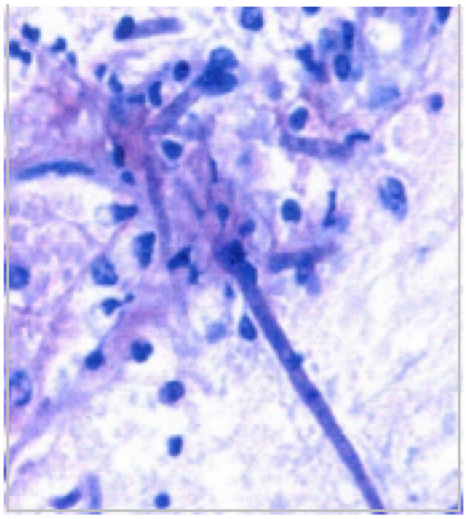

Figure 3: Trichosporon Asahii showing septate hyphae and arthroconidia

Conclusion

Wide distribution, antifungal resistance, and increasing risk factors have made Trichosporon as an increasing threat to immunocompromised patients including COVID-19. High mortality rates have been witnessed, with systemic infections, as well as an inconsistent optimal treatment, generate the need to increase the knowledge of this particular pathogen, in a way that allows us to understand its virulence mechanisms, and consequently, to do further research for the development of effective therapies against these microorganisms (7,8). Early diagnosis is critical,but is often missed or delayed due to lack of awareness about the spectrum of the disease. The treatment is different when comparing to other common yeast like candida and which adds to the high mortality associated with the disease (9).

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Informed Consent: Written informed consent was obtained from patient who participated in this study.

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Author contributions: established the diagnosis, managed the patient, wrote the manuscript, and searched the literature and designed the article for submission.

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