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RESEARCH ARTICLE

TRICHODERMA SPECIES IN URINE: AN EMERGING PATHOGEN OR A CONTAMINANT

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ABSTRACT

A 50 year old diabetic male patient with underlying Chronic Alcoholic liver disease and Hepato-renal syndrome type 2, presented with chief complaints of fever and pain over right side of the abdomen along with vomiting and generalised weakness. On two occasions, in the routine examination of un-centrifuged and centrifuged urine, we found septate hyphal mass. After culture on Saboraud's Dextrose Agar (SDA), morphologically we diagnosed it as Trichoderma species. Due to lack of definitive diagnostic tools, we could not establish its pathogenic role but since the patient was immunocompromised and catheterised, we could not rule out the organism as a mere contaminant. This scenario prompted us to report the case.

INTRODUCTION

Trichoderma species were previously considered to be a culture contaminant. However, as recently emerging fungal pathogens, Trichoderma strains have been detected on the skin, in the lung and as causative agents of peritonitis in peritoneal dialysis patients, and disseminated infections in the liver, brain, heart and stomach of immunocompromised patients with a hematologic malignancy or solid-organ transplant. In this case we isolated the organism twice from the urine sample but we could not establish the pathogenic role of the organism in causing UTI. THE CASE: A 50 year old diabetic male patient with underlying Chronic Alcoholic liver disease and Hepato-renal syndrome, presented with chief complaints of fever, ascites and pain over right side of the abdomen along with vomiting and generalised weakness. On examination,patient was febrile, temperature- 101.5^0F-102.5^0F. Catheterisation was done with Foley's catheter 20 hours ago.There was swelling of abdomen and fullness in the flanks.The patient was planned for dialysis first. Urine for routine examination and culture was sent on the day of admission.

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Laboratory reports- Blood reports- Hb 9.0 g%, Total bilirubin 2.8 mg/dl, Urea 92 mg/dl; Creatinine- 2.9 mg/dl, Sodium 110 mEq/L; Potassium 6.8 mEq/L, Fasting 170mg/dl & PP blood sugar-240mg/dl, HBAIC 6.7%. Sepsis Screen was within normal limit. USG Abdomen showedascites. HIV I and II was nonreactive. Blood culture showed no growth of any organism after 5 days of incubation in ordinary aerobic culture.

MATERIALS AND METHODS

Direct examination of Un-centrifuged urine

- Albumin 1+
- Sugar ++
- 5 pus cells/mm ^{3}
- Fungal hyphae in a mass (mycelia formation)

Direct examination of Centrifuged urine- 2 pus cells/7HPF
CULTURE-

- Mac Conkey agar- no growth
- Saboraud Dextrose Agar
- Colonies are white at first, became deep-green within 10 days. Growth occurred within 3days.

- Reverse side shows no pigment
- Staining with lactophenol cotton blue shows septate hyphae with conidiophores arising singly or aggregated into tufts, phialides ovate to flask-shaped borne singly or in groups. Conidia globose to ovate, smooth one-celled, borne in balls at tips of phialides.

Fig. 1. Growth on SDA showing obverse and reverse side of colony

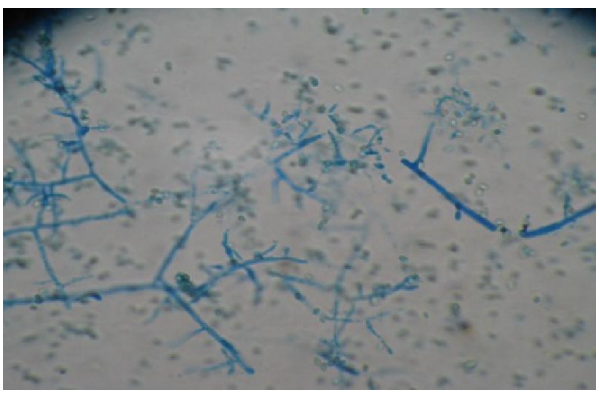

Fig. 2. Lacto phenol cotton blue staining of the growth from culture

DISCUSSION

Hyalohyphomycosis is the general term used for infections due to fungi with hyaline (that is, without any pigment) cell wall (Greek word 'Hyalos--glass'), septate, branched, or sometimes mycelial attributes. This is a general term used to group together infections caused by unusual hyaline fungal pathogens. They can be subcutaneous, organ or tissue specific or widely disseminated in immunocompetent or immunocompromised patients. Trichoderma spp. is common, soil-borne, filamentous fungi and has long been known as non-harmful microorganisms. They are used in biotechnology as sources of enzymes and antibiotics. Moreover, they are applied to agricultural crops as plant growth promoters and biofungicides (Jagdish Chander, 2013). Though Trichoderma species though were previously considered to be culture contaminants, recently it has gained importance as an emerging fungal pathogen (Kubak *et al*., 2009). Frequency of opportunistic fungal infections is increasing in recent years in immunosuppressed patients. Rare light coloured hyaline molds, including species of Trichoderma have been described as causing clinical disease more frequently than do other rare fungi (Duane, Hospenthal 2010). Trichoderma spp. are fungi distributed worldwide which rarely infect humans but can cause infections which range from localised to fatal disseminated disease (Josep Guarro *et al*., 1999). The majority of pathogenic Trichoderma isolates are members of the species Trichodermalongibrachiatum. Despite systemic antifungal therapy, the prognosis for Trichoderma infection is poor, regardless of the type of infection and the therapy used (Richardson, C. Lass-Flörl. 2008). Definitive diagnosis is difficult to achieve because of the lack of specific diagnostic tools. Are view of the literature suggests that Trichoderma spp. is being recognized as human pathogens with increasing frequency, particularly in immunocompromised patients.In our case, direct smear of urine showed fungal hyphae both in un-centrifuged and centrifuged urine and culture showed growth of Trichoderma species.

The urine examination was repeated and the result was same. Since the patient was diabetic with alcoholic liver disease (cirrhosis of liver) along with Hepato-renal syndrome (HRS) type 2, he was an immunosuppressed patient. Hepato-renal syndrome is a functional renal failure without any renal pathology that occurs in advanced liver disease or acute fulminant liver failure. HRS 2 is characterised by a reduction in Glomerular filtration rate with a deviation of serum Creatinine level, but it is fairly stable and associated with a good outcome. Direct examination of urine showed pus cells and fungal hyphae but no growth of bacteria was obtained. This scenario can be explained by the fungal infection of the urinary tract. However there was no sign of disseminated infection as blood culture was negative for the fungus, so there is a probability that the infection has been caused by the ascending route as the patient was catheterised. However there are limitations in our case as we lost the patient in follow up and also we could not perform molecular study and susceptibility test. Since we could not find any reference of UTI by Trichoderma species even after a thorough search of the internet, nor did we find any such mention in of our Microbiology text bookswe cannot be definite in concluding

that Trichoderma is an emerging urinary pathogen.However, the patient was immunocompromised and catheterised and the organism was isolated repeated times, so we cannot rule out the fungus as a mere contaminant.

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