Fusarium solani in the blood culture of a neonate – a case report

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***Abstract*- Disseminated fungal infections constitute one of the most challenging threats to the clinical fraternity.[1] Infection with *Fusarium* is associated with high mortality. A preterm low-birth weight baby was admitted in the NICU of a tertiary care hospital, for the management of low birth weight. In due course, she developed upper GI bleed, seizure episodes and further complicated by septic shock. Radiological findings were non-remarkable. Urine and blood samples were sent for routine microscopy and culture/sensitivity as well as fungal culture. The samples were inoculated on Blood Agar, MacConkey Agar and Sabouraud Dextrose Agar (SDA), following standard conventional methods. Growth on SDA was identified as *Fusarium solani.* The patient was treated with Intravenous administration of antibiotics Levofloxacin, Colistin and antifungal drug Fluconazole. Blood samples when cultured after therapeutic intervention did not show growth of any organism. The patient responded to the treatment and was discharged.**

***Keywords*: Yeast, Blood culture, Fusarium solani, Neonate**

INTRODUCTION

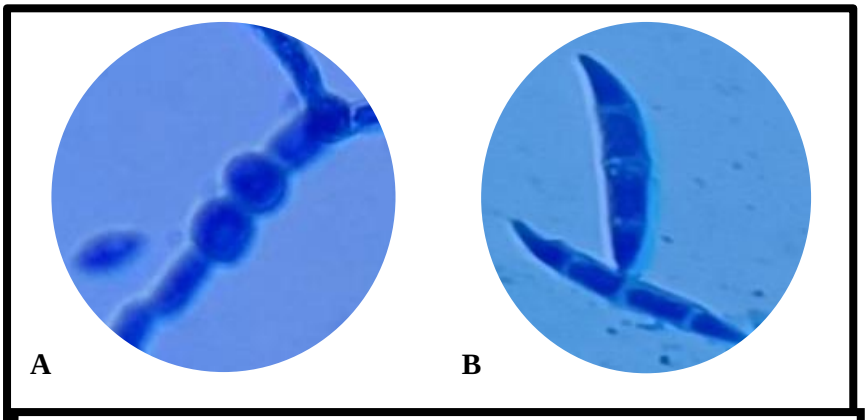
Fusarium is a filamentous ascomycete fungus, commonly found in soil, plant debris and water. The genus *Fusarium* can be identified by the production of hyaline, banana-shaped, multi-cellular macroconidia with a foot cell at the base.[1] It is frequently reported as plant pathogen and opportunistic human pathogen. Infection can be acquired through inhalation of aerosolized conidia or skin contamination, mostly in immunocompromised individuals. It is responsible for a broad spectrum of infections including locally invasive, disseminated and even toxicosis from mycotoxins. *Fusarium spp* frequently implicated in human infections include *F. solani*, *F. oxysporum* and *F. moniliforme*. Of these, *Fusarium solani* is the most virulent species responsible for disseminated infection. Infection caused *by Fusarium spp* is termed as fusariosis. The clinical form of fusariosis depends largely on the immune status of the host and the portal of entry. A striking characteristic is the high frequency of positive blood cultures, mostly in the context of disseminated disease.[2] This is possibly due to the fact that *Fusarium spp* produce yeast-like structures (adventitious sporulation) that facilitate their dissemination and growth in the blood causing thrombosis and tissue infarction and appear in tissues as acute branching septate hyphae. However, the characteristic feature of disseminated fusariosis lies in the high rate of positive blood culture.[3] Occasionally fungemia is the only manifestation of fusariosis, usually in absence of neutropenia, among patients with central venous catheters.[4] There has been case reports of *Fusarium solani* in HIV positive patient[5] and post-kidney transplant individual.[6] Belizario et al[7] has described the isolation of *Fusarium solani* from indoor air of NICU and stressed upon it as a cause for opportunistic infection in neonates. We report here a case of septicaemia due to *Fusarium solani* in an immunocompromised neonate.

CASE REPORT

A ten day old, female, preterm neonate, (body weight 1.46 kg) was admitted in the NICU for very low-birth weight care. The baby was delivered at a peripheral hospital and was transported to the tertiary care centre for further management. On the 2nd day of admission, she presented with persistent fever, refractory to multiple antimicrobials. It was further complicated by late onset neonatal sepsis. The neonate developed hypotension, tachycardia, gastrointestinal symptoms and reduced urine output. She was initially started on IV piperacillin-tazobactam and further escalated to meropenem, levofloxacin and colistin. Complete blood count revealed leucocytosis and thrombocytopenia. Blood was sent for bacterial and fungal culture. Blood culture specimen was inoculated on SDA and incubated at 25^{o} Celcius and 37^{o} Celcius. On 4th day of incubation SDA revealed colonies which were fluffy to cottony with tint of purple on obverse view. Further identification was done by the presence of oblongate and cylindrical, more of bean-shaped macroconidia on lactophenol cotton-blue mount. After the blood culture report confirmed the growth of *Fusarium solani*, IV Fluconazole was started. Post therapeutic intervention, blood samples came negative for fungal growth. The patient responded to treatment and was discharged.

SDA revealed

1. Obverse view: Fluffy to cottony, pale yellow colonies, which on further incubation turned into purple
2. Reverse view: Diffuse purple pigmentation



LPCB showing:(A) Chlamydospores arranged in chains
(B) Macroconidia

Slide culture showing:(C) Foot cell: Hyphal cell at the base of conidiophore, sharply angled
(D) Monophialidic cell

DISCUSSION

Fusarium spp are plant pathogens which exist ubiquitously in the environment. While they can cause superficial and subcutaneous infections in healthy individuals, they can give rise to deep and disseminated infections in immunocompromised patients. In the present study, a constellation of persistent fever despite of administration of multiple antibiotics and positive blood culture for a mold were considered diagnostic of fusariosis[8,9,10]. This was in concurrence with the study by Marchio et al,[8] where persistent fever not responding to broad spectrum antibiotics along with either one of skin lesion, pulmonary infiltrate, positive blood culture, positive 1-3-β-D glucan test were considered confirmatory for diagnosis. Culture identification was elementary in distinguishing between *Fusarium* and other members of the hyalohyphophomycosis family. The routine medical profile and sound health of the mother suggests that the disease was not transmitted vertically. It could have been peripartum or hospital acquired as there were no clear evidences of asepsis with respect to the delivery and transportation of the baby. Infections by *Fusarium spp* is frequently fatal and successful outcome is determined by the degree of persistence of immunosuppression and the extent of infection. In this case, factors which predisposed the immunocompromised state of the patient were preterm birth, very low birth weight, inadequate aseptic measures in care of the patient, irrational use of antimicrobials and prolonged hospital stay. There are very few clinical evidences of fusariosis in patients of NICU and the probability of transmission from an environmental source cannot be ruled out

CONCLUSION

Infection control policies should be carried out, aiming reduction in the number of airborne fungal spores. Early diagnosis and treatment play a crucial role in the outcome. This is a case of fusariosis in a preterm low-birth weight neonate, with sepsis admitted in NICU and was subsequently cured with IV combined antibiotic-antifungal therapy. To the best of our knowledge this is the first report of *Fusarium solani* isolated from blood culture of a neonate from Central India.

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