OUTBREAK OF PROTOTHECA WICKERHAMII ALGAEMIA AND SEPSIS IN A TERTIARY CARE CHEMOTHERAPY ONCOLOGY UNIT

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INTRODUCTION

**Prototheca wickerhamii**
- Emerging, opportunistic, pathogenic green alga
- Earlier interpreted as contaminants in blood and faeces
- **Prototheca** is expanding its pathogenicity and host range
- Protothecosis is a zoonotic disease of dogs, cats and cattle
- Outbreak of **Prototheca wickerhamii** algaemia and sepsis in a tertiary care chemotherapy oncology unit discussed

METHODS

- All patients detected to have algaemia were operationally included in the case definition
- The first case was taken as index case
- Infection control measures were intensified
- Hypothesis of person to person transmission with all patients in the chemotherapy unit being at risk
- Clinicodemographic patient profile, diagnosis, duration of stay in hospital, clinical features, treatment protocol and neutrophil count were correlated
- Blood cultures repeated every third day for all patients
- Yeast-like colonies were subcultured at 22°C and 37°C on Sabouraud’s dextrose agar
- Isolates were tested for urease, Germ tube formation and automated identification through VITEK 2 (bioMérieux)
- Non repeat positive cultures with respective susceptibility patterns were considered for profiling of isolates
- Isolates were interpreted along with colony characteristics, micromorphology, substrate utilization reactions, disc diffusion antifungal susceptibility patterns and clinical correlates
- All patients were initiated on liposomal amphotericin B (5 mg/kg body weight/day)
- Fecal cultures of affected patients were undertaken to screen for any evidence of colonization or dissemination

**RESULTS**

- The outbreak affected 12 patients in 50 days
- Patient care, infection control, sterilization and housekeeping protocols were as per laid out Standard Operating Procedures (SOPs)
- The unit had an average occupancy of 26 patients (86.67%) during the temporal extent of outbreak
- Mean hospital stay for all patients in the unit was 60 days
- Mean age of affected patients was 37 ± 10.74 years
- Mean neutrophil count in patients was 150 ± 10.74 /dl
- A minimum of one and a maximum of three patients of algaemia were present in the unit at a given time
- No specific clinical features were noticed during the period of algaemia
- The hypothesis of person to person transmission could not be substantiated
- Repeat blood cultures confirmed algaemia
- Preliminary micromorphological examination revealed Gram positive 3-11 μ non-capsulated spherical yeast-like cells without budding and pseudohyphae
- Yeast-like colonies were isolated on subcultures at 37°C on Sabouraud’s dextrose agar
- All were negative for urease and Germ tube
- VITEK 2 compact provided 99% identification probability (identification number 4502100000205110)
- MICs in µg/ml: Amphotericin B 0.5 and Voriconazole 2
- All patients responded to liposomal amphotericin B

**DISCUSSION & CONCLUSION**

- Post treatment blood cultures were negative
- One patient detected to have algaemia went into sepsis
- Fresh fecal cultures from patients were not contributory
- Environmental surveillance was negative
- **Prototheca** was not isolated from staff & other patients
- No case of algaemia was seen in the follow up period

**Surveillance studies for possible environmental reservoirs such as room air, air handling unit vents, water, sinks, surfaces, antiseptic solutions, crystalloids and medical devices were undertaken**

**Healthcare staff and other patients were screened through cultures of faeces and fingertips**

**Surveillance for **Prototheca** algaemia was continued for one year post outbreak**

**Prototheca wickerhamii** under 1000X and colonies on blood agar

**Immune compromised neutropenic patients having Protothecosis may not manifest clinical features**

**Outbreaks are difficult to detect and control as human to human transmission is rare**

**Dynamics of Prototheca infection may not be predictable**

De novo appearance of outbreak should be considered in any cohort comprising immune compromised patients affected with opportunistic pathogens

Such hospital outbreaks re-emphasize the need to strengthen hospital and laboratory based surveillance systems to ensure adequate preparedness, rapid detection and response to outbreaks.