

Fatal Septic Shock in 50 Year Old with Unusual Organism isolated from the Blood

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Case History

A man in his 50s was admitted to the intensive care unit with fever, shock and low level of consciousness after being found collapsed. Initial assessment revealed severe acute liver failure (ALT 6300 U/L, PT 14.4 seconds) and renal failure, with significant acidosis (lactate 9.5).

Clinical examination showed decreased conscious level and a blanching erythematous macular rash of the back, chest and shoulders and peripheral vascular shut down. The patient was commenced on organ support and broad spectrum antibiotic chemotherapy, with meropenem and gentamicin. CT Chest-Abdomen-Pelvis was performed and revealed patchy bibasal consolidation of the lungs and unremarkable appearances of the abdominal viscera.

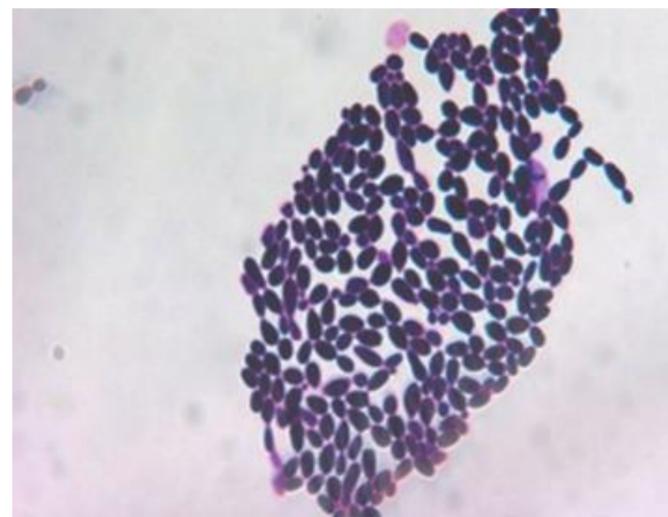
Past history was notable only for unconfirmed intravenous drug use and alcohol dependence. Blood cultures were drawn on the second day of ICU admission and incubated using standard protocol (Biomerieux). Despite haemofiltration and inotropic support, the patient failed to stabilise, and treatment was withdrawn on the fourth day of admission due to the extent of organ damage.

After 4 days incubation, growth was detected in the aerobic blood culture bottle and initial gram stain revealed the appearance of yeasts. After overnight culture on blood agar media, colonies were transferred to MALDI-TOF (Bruker) for analysis, which identified the microbe with high degree of certainty. What was the organism? Answer: *Rhodotorula mucilaginosa*

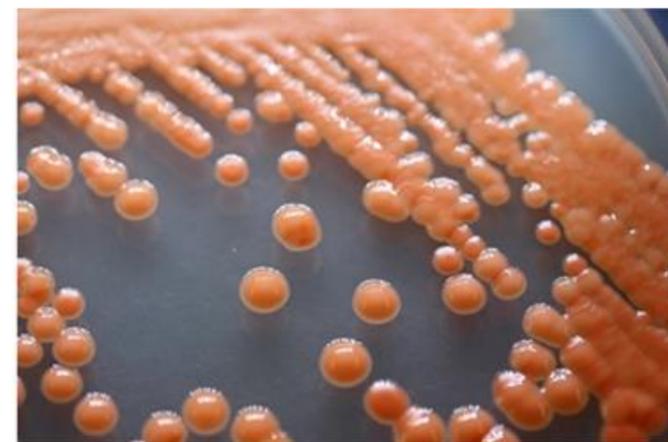
Fluconazole	Voriconazole	Posaconazole	Isavuconazole	Amphotericin B	Anidulofungin	Caspofungin	Micafungin	5-Flucytosine
I	I	I	I	S	R	R	R	S

Discussion

Rhodotorula is a ubiquitous fungus in the environment but is rarely reported in fungaemia. Indeed a literature review identified only 67 cases of *Rhodotorula* fungaemia reported between 2000 and 2011. Risk factors for fungaemia are presence of central venous catheters (CVC), haematological malignancy, cytotoxic agent use as well as steroid administration. Its widespread presence in the environment, including in foods and on human palms, make it a potential opportunistic agent, as well as a possible contaminant of blood cultures. When the organism has been isolated and identified from the blood, Amphotericin B has been the most frequently used antifungal agent. Azole antifungals such as fluconazole are not usually effective against *Rhodotorula*, and echinocandins are never effective. Our isolate was tested by the Bristol Mycology Reference Laboratory which confirmed high-level resistance to fluconazole. MIC for Amphotericin B was 0.2 mcg/ml which is susceptible.



Gram stain showing budding yeasts



Sabaraud Dextrose Agar showing pink-red mucoid colonies

Take-home messages

- Beware 'odd' yeasts in blood cultures
- Push for rapid, accurate identification
- Involve reference laboratory early
- Echinocandins and azoles are not a panacea for all yeasts
- Might need to consider empirical use of Amphotericin B depending upon the patient

References:

Molecular basis of antifungal drug resistance in yeasts; Morio et al.; *International Journal of Antimicrobial Agents*; Vol 50 (5); Nov 2017: 599-606

Molecular identification, Antifungal susceptibility profile, and Biofilm production of Clinical and Environmental *Rhodotorula* Species Isolates; Nunes et al.; *Antimicrobial Agents Chemotherapy*, 2013, 57 (1): 382

Rhodotorula fungemia: two cases and a brief review; Duggal et al.; *Medical Mycology*, Volume 49, Issue 8, 1 November 2011, Pages 879-882