

An unusual case of *Rhodotorula mucilaginosa* fungaemia in a cancer patient

Valentino Granero,¹ Elvio Peyronel,¹ Nicoletta Mensa,² Nicola Liuzzi,² Cristina Costa,³ Maria Rita Cavallo¹

¹Rivoli-Pinerolo Unified Analysis Laboratory, ²Department of General Medicine, Local Health Unit TO3, Pinerolo (TO); ³Department of Microbiology and Virology, University Hospital "Città della Salute e della Scienza di Torino", Turin, Italy

Summary

Rhodotorula is emerging as a relevant cause of nosocomial and opportunistic infections. Herein, we present a case of fungaemia due to *Rhodotorula mucilaginosa* in a cancer patient with lumbosacral stimulator for herniated disc with unfavourable outcome. The patient was hospitalized for twenty days during which he underwent various diagnostic tests before discovering the presence of colon cancer. At day 16 of hospitalization, a bloodstream infection due to *R. mucilaginosa* with an antimycogram profile resistant to fluconazole occurred. It is emphasized the need for the rapid and correct identification of *R. mucilaginosa* in order to set up as fast as possible a pathogen driven therapy, in particular in the immunocompromised subjects.

Introduction

Rhodotorula, Basidiomycota phylum, is a common environmental yeast that is found in air, soil, lakes, ocean water, milk, and

fruit juice. It colonises plants, humans, and other mammals (9).

The genus includes eight species, among which *R. mucilaginosa* (old name *R. rubra*), *R. glutinis* and *R. minuta* are known to cause disease in humans (9). In this regard, in the last two decades these yeasts have emerged as opportunistic pathogens mostly in immunocompromised patients (3).

Recent studies have reported incidence of *Rhodotorula* fungaemia between 0.5% and 2.3% in the USA and Europe (7). Most cases of *Rhodotorula* fungaemia are associated with the presence of central catheters in patients with haematological malignancies (2,8).

We report a case of *R. mucilaginosa* fungaemia in a cancer patient with lumbosacral stimulator for herniated disc with unfavourable outcome.

Case Report

The patient was a 69-year old male suffering from herniated disk and unaware of the presence of colon cancer. At admission to the emergency department, the patient presented with fever of 39°C lasting three days associated with diarrhoea and difficulty in ambulation. He was admitted to the medicine department for deterioration of general condition with suspected sepsis. The patient presented the followings: heart rate 115 bpm, temperature: 37.5°C, Glasgow Coma Score: 15, rhabdomyolysis, and abnormal haematochemical analysis (CPK 1877 IU/L, C-reactive protein 34.77 mg/dL, Na⁺ 132 mEq/L, INR 1.75). After the insertion of a urinary catheter, blood (one set) and urine cultures were performed and resulted negative. Subsequently, he was treated with Amoxicillin (e.v. 2.2 g every eight hours in 100 mL of saline, for three days) and Azithromycin (e.v. 500 mg in 250 mL of saline, in a single administration), acetaminophen (e.v. 1 vial for three times on day, for three days) and gabapentin (os: 300 mg for two times at day), haloperidol (for agitation), with no effective benefit. Due to the progressive deterioration of motor performance and appearance of cognitive impairment (ideational slowdown, mental confusion, disorientation), at day 10 the patient was transferred to the neurology unit and the following studies were performed: brain computed tomography scan (evidencing soft signs of chronic vascular changes); electroencephalogram (characterized by slow abnormalities on central and front-temporal regions); cerebrospinal fluid examination (clear, 2 leukocytes/mm³, increase in proteins and albumin, negative culture and neurotropic viruses). On day 12, given the dubious clinical conditions and after infectious disease consultancy, the therapy was replaced by Meropenem (2 g for 3/die, for three days) and Acyclovir (10 mg pro-kg for 3/die, for three days) with substantial benefit and disappearance of fever.

Two days after discontinuation of antibiotic therapy (day 16 of

Correspondence: Valentino Granero, S.C. Laboratorio Analisi Unificato Rivoli-Pinerolo ASL TO3, Via B. Cagliari 39, 10064 Pinerolo (TO), Italy. Tel.: +39.0121.233218 - Fax: +39.0121.233034. E-mail: vgranero@aslto3.piemonte.it

Key words: *Rhodotorula mucilaginosa*, fungaemia, opportunistic infection.

Contributions: VG, first author, microbiologist during the case report; EP, author, microbiologist during the case report; NM, author, physician during the case report; NL, author, director of medical division during the case report; CC, author, microbiologist consultant/supervisor during the case report; MRC, author, director of laboratory analysis during the case report.

Conflict of interest: the authors declare no potential conflict of interest.

Received for publication: 1 June 2017.

Revision received: 31 August 2017.

Accepted for publication: 3 September 2017.

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Licensee PAGEPress, Italy
Microbiologia Medica 2017; 32:6827
doi:10.4081/mm.2017.6827

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hospitalization), the patient presented again fever (38.8°C) with tachycardia, dyspnoea and somnolence. The following studies were performed: blood gas analysis, blood tests and culture (two sets of samples spaced 30'); thoracic and abdominal computed tomography, and computed tomography angiography. The presence of solid lesions in the adrenal area, with infiltration of the inferior vena cava and thickening of the rectum was found.

At day 18, colonoscopy confirmed the diagnosis of colon cancer. Meanwhile, preliminary identification of *R. mucilaginoso* from blood cultures performed at day 16 was made. Only both aerobic bottles of blood culture became positive after twenty-nine hours of incubation at 35°C (BD BACTECT, Becton Dickinson, Franklin Lakes, NJ, USA); Gram staining evidenced the presence of yeasts. Specimen was seeded on Agar Sabourad (Kima Vacutest, Padua, Italy) and ChromID® Candida (BioMerieux, Mercy L'Etoile, France) after overnight incubation at 37°C.

The following day, the patient was afebrile in the absence of antifungal therapy. Antimycogram was available in the morning of day 20 (Table 1); in the evening the patient died of neoplastic thrombosis of the inferior vena cava.

Discussion and Conclusions

The genus *Rhodotorula* is a pigmented yeast classified under the family Cryptococcaceae and includes 38 species. *Rhodotorula* species have several morphologic and physiologic similarities with *Cryptococcus* species, but differ from them by the typical carotenoid pigment (ranging from yellowish to red) (6) and by the inability to assimilate inositol (9).

Members of *Rhodotorula* species are generally considered to be non-pathogenic and have rarely been a cause of infection in humans. They are commonly recovered from human skin, lungs, conjunctivae, urine and gastrointestinal tract (1). Though it is a

saprophyte, its isolation from blood cultures and other sterile fluids such as cerebrospinal fluid can be relevant when contamination is ruled out (4). Indeed, *Rhodotorula* spp. have been implicated as a cause of meningitis, endocarditis, ventriculitis, peritonitis, fungaemia, central venous catheter infection and keratitis (9).

However, bloodstream infection due to *Rhodotorula* is extremely rare and mostly associated with underlying immunosuppression or cancer [4,7,8].

In this case, there were microbiological evidence of the *Rhodotorula* presence in blood culture and clinical evidence of neoplasm. Despite the unfavourable outcome, this report highlights the risk of developing invasive fungal infections by *Rhodotorula* in immunocompromised patients. Antimycogram profile was coherent with those previously reported with the presence of resistance only to fluconazole [5,7,8].

In conclusion, it is emphasized the need for the rapid and correct identification of *R. mucilaginoso* in order to set up as fast as possible a pathogen driven therapy, in particular in the immunocompromised subjects.

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Table 1. Antimycogram susceptibility test.

Drug	MIC (mg/mL)	Results
Itraconazole	2	Sensible
Voriconazole	2	Sensible
Fluconazole	>64	Resistant
Caspofungin	2	Sensible
Posaconazole	ND	ND
Amphotericin B	ND	ND
5-fluorocytosine	ND	ND

ND, Not Determined. Inhibition of disk diffusion test with RPMI agar after incubation at 37°C for 24 hours.