

Recurrent *Saccharomyces Cerevisiae* Fungemia in an Otherwise Healthy Patient

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Fungal diseases are relatively uncommon and occur mostly in immune-compromised patients. *Saccharomyces cerevisiae* is one of the less common fungal pathogens and rarely causes disease in humans. We report a case of recurrent fungemia caused by the yeast in an otherwise healthy patient.

PATIENT DESCRIPTION

A 35 year old woman was admitted in March 2004 with sudden onset of high grade fever, chills, headache, nausea and abdominal pain. Her past medical history was relevant for recurrent vaginal bleeding 3 years earlier, related to arteriovenous malformations located in the uterus, uterine cervix and proximal part of the vagina. Hemostatic sutures for bleeding lesions, angiographic embolizations of the uterine arteries and local radiotherapy to the pelvis failed to stop the bleeding, necessitating transabdominal hysterectomy and upper vaginectomy. During one of the bleeding episodes, an intrauterine device was sought but not found. Explorative laparotomy was performed but failed to reveal the device.

On admission, the patient looked severely ill, pale and drowsy. Her temperature

was 40°C, blood pressure 90/60 mmHg and heart rate 110 beats per minute. Neck rigidity and diffuse abdominal tenderness were noted, together with mild hepatosplenomegaly. Laboratory tests revealed leukopenia of 2200 cells/μl with a left shift and 87% neutrophils. The hemoglobin was 12.9 g/dl and mean corpuscular volume 77 fl. Erythrocyte sedimentation rate was 28 mm. Mild elevation was found in aspartate aminotransferase (57 U/L) and alanine aminotransferase (48 U/L). Lumbar puncture revealed normal cerebrospinal fluid, glucose and protein, without cells. CSF culture was sterile. Chest X-ray was normal. Urinalysis showed 3–4 leukocytes and 6–9 erythrocytes in high power field. Multiple blood cultures and a urine culture were obtained, as were viral and bacterial serologic tests.

Intravenous fluids with metoclopramide and papaverine were administered. Her temperature dropped to 38°C and she reported marked relief from her headache and abdominal pain. Leukocyte count increased up to 5500 cells/μl, and ALT and AST values normalized. On the fourth day, urine culture revealed growth of *Escherichia coli* and Enterobacter, both sensitive to quinolones. Ofloxacin was given orally, 400 mg a day. The next day, we were informed about the growth of yeasts in five of nine blood cultures taken earlier. Intravenous fluconazole was started, 400 mg a day. Abdominal ultrasonography and computed tomography demonstrated hepatosplenomegaly with a small effusion surrounding the gallbladder and a moderate amount of pelvic fluid.

CSF = cerebrospinal fluid
ALT = alanine aminotransferase
AST = aspartate aminotransferase

Serology tests revealed the carrier state of hepatitis B virus. Serology tests for cytomegalovirus, Epstein-Barr virus, parvovirus, Mycoplasma, Q-fever, Brucella and human immunodeficiency virus were all negative. Antinuclear antibody and rheumatoid factor were also negative.

Immunophenotyping performed on peripheral white blood cells, protein electrophoresis and complement factors were normal. Vaginal discharge culture was negative for fungi. The yeast was identified as *Saccharomyces cerevisiae*. Echocardiography (both transthoracic and transesophageal) revealed no vegetations and no valvular pathology. Gastroscopy showed normal upper gastrointestinal tract. Five days later the patient became symptom free, with normal body temperature and laboratory profile. She was discharged with oral fluconazole, 400 mg a day.

Four days later the patient presented again with sudden onset of chills, headache, abdominal pain, nausea and vomiting. On physical examination she looked very ill, pale and drowsy and her temperature was 39.7°C. The abdomen was diffusely tender with mild hepatosplenomegaly. Laboratory tests revealed leukopenia of 4200 cells/μl with left shift and 94% neutrophils. Blood chemistry was normal, and urine examination found 5–8 white blood cells in high power field. Erythrocyte sedimentation rate was 60 mm. Multiple blood cultures were drawn and intravenous amphotericin B (0.8 mg/kg/day) was started. Abdominal ultrasound and CT were performed again and showed mild hepatosplenomegaly and a small amount of pelvic fluid. A small elongated metallic particle (0.8–1 cm long) was demonstrated in the lower pel-

vis. FDG-positron emission tomography scan showed the same findings with no pathological uptake.

On the fifth day the patient became afebrile and had only mild abdominal pain and nausea. Blood cultures grew *Saccharomyces cerevisiae*, which was sensitive for AMB. The patient received amphotericin for 14 days and was discharged with no fever or abdominal pain. Colonoscopy was performed 2 weeks later and showed normal colonic mucosa. All of the blood cultures taken after starting amphotericin were negative.

Six weeks later the patient was again admitted with the same symptoms. Blood tests revealed similar values, especially leukopenia with a left shift, and blood cultures again revealed *Saccharomyces cerevisiae*. On admission amphotericin 1 mg/kg/day was started. The patient became afebrile within 2 days and remained so for 2 weeks when recurrence of the symptoms was observed, and repeated blood cultures again showed the growth of *Saccharomyces cerevisiae*. Bone marrow aspiration and biopsy showed normal hematopoietic system. In bone marrow cultures *Saccharomyces cerevisiae* was found.

Gallium scan showed no pathological uptake. Flucytosine was added, 1.5 g four times a day, for 4 additional weeks. The patient became afebrile and repeated cultures were negative. She was free of symptoms for 4 months, before being admitted for the fourth time with the same symptoms and signs and growth of the same pathogen in blood cultures. On the fourth admission she was treated with oral voriconazole, with which she was discharged.

After 2 months of voriconazole treatment the patient was admitted for the fifth time, again with the same symptoms

and signs and with the growth in blood cultures of the same pathogen. She was treated with amphotericin and flucytosine, became afebrile 5 days later and was discharged with oral fluconazole therapy. She was free of symptoms for 9 months, when she was admitted again in November 2005. She had four admissions during 2006, one in 2007, seven times in 2008, three times in 2009 and two in 2010. Reevaluation was performed several times but failed to locate a possible endogenous etiology for the fungemia.

COMMENT

S. cerevisiae, the brewer's or baker's yeast, is an ascomyceteous yeast and a plant saprophyte. It is useful in food industries and important in the brewing of beverages and preparation of bread and cakes. A probiotic dietary supplement was used commonly for treating or preventing diarrhea caused by *Clostridium difficile*, infections or associated with inflammatory bowel disease [1-4], mostly in severely ill patients or those hospitalized in intensive care units. Almost all the reports described fungemias in severely ill patients, most of whom had long hospitalizations, mainly in ICUs. Almost all the patients had exposure to the yeast (as a dietary supplement, used to treat diarrhea, or patients in the vicinity of other patients treated with the supplement). Most patients were immunocompromised, had malignant diseases, were receiving chemotherapeutic treatments or had complicated abdominal surgery. Possible mechanisms for the infections were contamination of indwelling catheters, migration of the yeast across damaged mucosal gastrointestinal barriers, or pulmonary infections [1,2]. Treatment is

ICU = intensive care unit

based on discontinuation of the probiotic preparation and the use of anti fungal agents.

Munoz et al. [5] described three patients hospitalized in an ICU in April 2005 who had *S. cerevisiae* fungemia and reviewed all the 57 known cases reported in the English literature of *Saccharomyces cerevisiae*. The only common risk factor for *S. cerevisiae* fungemia was the use of a probiotic containing the yeast, generally for treating or preventing diarrhea. Sixty percent of the patients had an ICU stay while infected and 70% had enteral or parenteral nutrition. Twenty-six patients (48%) had used the probiotic and 17 (30%) died.

Our patient is the first otherwise healthy patient described to have a recurrent, community-acquired infection and no exposure to the yeast. She did not receive any dietary supplementation or probiotic preparations.

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“It is not what we do, but also what we do not do, for which we are accountable”

Moliere (1622-1673), French actor and playwright considered one of the greatest masters of comedy in Western literature

“The most dangerous of all falsehoods is a slightly distorted truth”

Georg Christoph Lichtenberg (1742-1799), German scientist and philosopher