

Urinary Tract Infection with *Candida glabrata* in a Patient with Spinal Cord Injury

Monireh Rahimkhani, Mostafa Saberian, Alireza Mordadi,
Sajad Varmazyar, and Ali Tavakoli

Department of Lab Medical Sciences, School of Allied Medical Sciences,
Tehran University of Medical Sciences, Tehran, Iran

Received: 11 Jun. 2014; Accepted: 12 Oct. 2014

Abstract- *Candida glabrata* was thought to be a primarily non-pathogenic organism. However, with the ever-increasing population of immunocompromised individuals, it is considered to be an opportunistic pathogen. Patients with spinal cord injuries often using a long-term urinary catheter and are high risk for Urinary Tract Infections. This case report describes a patient with spinal cord injury (thoracic region) with a pure culture of *Candida glabrata* in a urine sample.

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Acta Med Iran 2015;53(8):516-517.

Keywords: *Candida glabrata*; Urinary tract infection; Spinal cord injury

Introduction

Candida glabrata (*C. glabrata*) is a haploid yeast of the genus *Candida*, previously known as *Torulopsis glabrata*. This species of yeast is non-dimorphic, and no mating activity has been observed. Until recently, *C. glabrata* was thought to be a primarily non-pathogenic organism. However, with the ever-increasing population of immunocompromised individuals, trends have shown *C. glabrata* to be a highly opportunistic pathogen of the urogenital tract and of the bloodstream. There are two widely cited potential virulence factors that contribute to the pathogenicity of *C. glabrata*. The first is a series of adhesins coded by the EPA (epithelial adhesin) genes. These genes, located in the subtelomeric region, can respond to environmental cues that allow them to be expressed en masse so the organism can adhere to biotic and abiotic surfaces in microbial mats. This is also the suspected mechanism by which *C. glabrata* forms microbial "biofilms" on urinary catheters (1). Cultures are an effective method for identifying *C. glabrata*. The culture may take several days to grow, but the identification of the yeast species is quick once the yeast is isolated.

A spinal cord injury (SCI) refers to any injury to the spinal cord that is caused by trauma instead of disease. Depending on where the spinal cord and nerve roots are damaged, the symptoms can vary widely from pain

to paralysis to incontinence. SCI has many causes, but are typically associated with major trauma from motor vehicle accidents, falls, sports injuries, and violence (2). Based on American Spinal Injury Association (ASIA) classification, Spinal cord injuries are described at various levels of "incomplete", which can vary from having no effect on the patient to a "complete" injury which means a total loss of function. Determining the exact "level" of injury is critical in making accurate predictions about the specific parts of the body that may be affected by paralysis and loss of function. The level is assigned according to the location of the injury by the vertebra of the spinal column closest to the injury on the spinal cord. Spinal injuries are divided into three categories: cervical, thoracic, and lumbosacral injuries (3).

Case Report

A 48-year-old man was admitted to "Brain and spinal injury repair research centre" in Emam Khomeini Hospital, Tehran University of Medical Sciences. He complained of fever, chills and no other Urinary Tract Infection (UTI) symptoms. He had fallen from a height on March 2013 and since then used a urinary catheter. There was injury to thoracic spinal cord (T12) and in ASIA classification was belong to category A. A indicates a "complete" spinal cord injury where no

Corresponding Author: M. Rahimkhani

Department of Lab Medical Sciences, School of Allied Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran
Tel: +98 21 88957943, Fax: +98 21 88983037, E-mail address: rrahimkhani@sina.tums.ac.ir

motor or sensory function is preserved in the sacral segments S4-S5 in history of patient; he did not have UTI or take any Antibiotic. The catheter port was cleaned with 70% alcohol, and 10 ml urine was collected using a needle and syringe and was referred to Microbiology laboratory and were analyzed with biochemical and microbiological investigations. Urine sample was plated on specific and nonspecific culture media included Blood agar, E.M.B agar and Mac Conkey agar. In the microscopic investigation, the specimen was showing the presence of puss cell (>5/HPF), hematuria (more than 50 RBC/HPF) and pyuria (Many WBC/HPF) but without any bacteria. There was a pure culture of cloudy white colonies with 2-3 mm diameter on media cultures (>100000 CFU/ml). In a microscopic survey of colonies with gram stain, there was pure yeast form of fungi. The colonies were subcultured on fungi specific culture media and were identified with biochemical tests. Sugar assimilation was performed by an auxanographic technique using yeast nitrogen base and various carbohydrates (glucose, galactose, sucrose, maltose, xylose and trehalose). *C. glabrata* assimilates glucose and trehalose (4). The results show that the microorganism agent of UTI in this patient was *C. glabrata*. The isolated *C. glabrata* was tested for antifungal susceptibility testing by disc diffusion method.

Discussion

UTI is the most common infections in spinal cord injuries patients. About 10% to 15% of UTIs are because of *Candida* species, and the prevalence is still increasing. In patients receiving broad-spectrum antibiotics or those with long-term urinary catheters, the clinical course of fungal UTI vary from being an asymptomatic and self-limiting disorder to fungal septicemia which can be fatal (5). All *Candida* species are capable of causing UTI, and in many centers worldwide, non-*C. albicans* species now predominate. Among *Candida* species, *C. albicans* is the most common isolated species according to epidemiological studies of fungal UTI. The newly emerging non-*C. albicans*, including *C. glabrata* is the agent of infections including UTI in hospitalized patients (6). A study of the prevalence of nosocomial candidiasis in Turkey, indicate that UTI with candida was in 57 (72.1%) patients and 16.14% of isolated candida were *C. glabrata* (7). Based

on Freitas's survey on 95 yeasts isolated from nosocomial urinary infection, there were 31 (61.3%) *C. glabrata* (8).

What causes the difference in this case is that he had not been hospitalized although he has used urinary catheter for long term but he didn't has previous UTI or taking any antibiotics in his recent history and suddenly referred to "Brain and spinal injury repair research centre" with symptoms of fever and chill. In the microbiological investigation, there was pure *C. glabrata* culture in urine sample. The results of this survey indicated although *C. glabrata* is thought to be a primarily non-pathogenic organism but in this case with an injury on thoracic spinal cord region, it was a pathogen and caused symptomatic UTI.

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