Challenge 1604-1

April 2016

Peritoneal fluid: *Candida lusitaniae*

HISTORY

This challenge was sent as a simulated peritoneal fluid sample (skin for the Dermatophyte Mycology participant).

Laboratories were expected to isolate and identify *Candida lusitaniae* and perform antimicrobial susceptibility testing within their possibilities or refer the isolate for testing.

CMPT QC/QA/Statistics

All Mycology samples are produced at CMPT according to CMPT internal protocols.

The samples are assessed for homogeneity and stability using in-house quality control methods and random selection of samples before and during production, and post sample delivery. The number of random samples selected is 15% of the total production batch.

The sample was verified by a reference laboratory. *C. lusitaniae* was isolated as a pure culture after 48 hours incubation on Sabouraud dextrose and Phytone agars at 30°C.

The challenge sample lot was confirmed to be homogeneous and stable for at least **30** days.

All challenge components have in-house assigned values based on the most clinically appropriate result; the most clinically appropriate result is determined by expert committee evaluation. No further statistical analysis is performed on the results.

SURVEY RESULTS

All 9 Mycology Plus (MP) participants correctly reported *Candida lusitaniae*. The Dermatophyte Mycology (DM) participant reported no growth.

Mycology challenges are not graded.

COMMENTS ON RESULTS

It is encouraging that 100% of the MP program laboratories reported *C. lusitaniae* in this challenge. The DM did not obtain any growth as this laboratory only uses DTM (Dermatophyte Testing Medium) for the diagnosis of superficial mycosis which contains cycloheximide; *C. lusitaniae* does not grow in cycloheximide-containing media.

IDENTIFICATION

Colony morphology

Colonies grown on Sabouraud's agar for 3 days at 25°C are white to cream colored, glistening, soft, and smooth. [1]

Microscopic morphology

On routine primary media, yeast cells are subglobose, ovoid, or elliptical. On cornmeal-

Tween80 agar at 25°C, for 72 hours, pseudohyphae are slender, branched, and curved with short chains of elongate blastoconidia. [1, 2]

Species-level identification of significant yeast isolates is important for appropriate antifungal therapy, since opportunistic yeasts vary greatly in their susceptibilities to current antifungal agents.

It is known that strains of *C. lusitaniae* may show resistance to amphotericin B, [3] while *Candida krusei* and *Candida glabrata* are relatively resistant to fluconazole. [4, 5]

Identification of *C. lusitaniae* to the species level is accomplished by physiological, assimilation and fermentation tests. [1, 6]

Characteristics of *C. lusitaniae:*

- Germ tube test is negative.
- Hydrolysis of urea is negative.
- Growth on cycloheximide medium is negative.
- Growth at 37°C is positive.

Table 1. Results reported

Program	Reported result	Labs
Mycology Plus	*Candida lusitaniae* ± closely resembling	9
Dermatophyte Mycology	No growth	1

Table 2. Susceptibility results

	Results reported
Amphotericin B	2 laboratories tested Susceptible, but only one reported (MIC ≤ 0.25mg/L); 1 laboratory reported comment A; 1 laboratory reported comment B
Voriconazole	2 laboratories tested and reported Susceptible (MIC ≤ 0.12mg/L); 1 laboratory reported comment C.
Fluconazole	4 laboratories tested and reported Susceptible (MIC ≤ 1mg/L); 1 laboratory reported comment C.
5Flurocytosine	2 laboratories tested and reported Susceptible (MIC ≤ 0.06mg/L)
Micafungin	2 laboratories tested Susceptible, but only one reported (MIC 0.25mg/L); 1 laboratory reported comment C.
Caspofungin	2 laboratories tested and reported Susceptible (MIC 0.5mg/L)

Comment A: Amphotericin B- Interpretation not established.

Comment B: Due to the possibility of Amphotericin B resistance with *Candida lusitaniae*, our laboratory would consult the attending physician and if there was a possibility of treating with Amphotericin B, we would refer to reference laboratory for susceptibility.

Comment C: There are no established clinical breakpoints for this antifungal. Results suggest susceptibility is likely but does not reliably predict clinical response. For treatment of critical infections, consult Medical Microbiologist on call.

Morphologically, *C. lusitaniae* resembles *C. tropicalis* and are distinguished on the basis of their ability to reduce tetrazolium salt or assimilate rhamnose. [2, 7]

CLINICAL RELEVANCE

Most fungal peritonitis cases are caused by *C. albicans* or other *Candida* species such as *C. guilliermondii*, *C. krusei*, *C. parapsilosis* and *C. tropicalis.* [6] *C. lusitaniae* is as an opportunistic pathogen in immunocompromised patients and may cause life-threatening infections in these hosts. [3, 8]

A review of *C. lusitaniae* infections revealed that fungemia was the most common type of infection, occurring in 80% of cases. A primary infectious focus was identified only in 16.4% of the cases. Other *C. lusitaniae* infections included peritonitis (7.3%), meningitis (5.5%), urinary tract infection (5.5%), and vulvovaginitis (3.6%). In this review, five (21.7%) of 23 isolates were resistant to amphotericin B. [9]

Interpretive criteria for amphotericin B or posaconazole have not yet been defined but some investigators classify the isolates inhibited by >1 µg/ml of amphotericin B as susceptible and those inhibited by >1 µg/ml as resistant. [10]

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