

## Background

- Invasive candidiasis is a life-threatening infection with 40% mortality despite antifungal therapy
- T2Candida detects the 5 most common *Candida* species from whole blood within 3 to 5 hours
- In our institution the test required ordering approval by assessing candidemia risks
- The aim of this study was to assess test utilization and the impact of results on antifungal use

## Methods

- Retrospective chart review of T2Candida Panels from March 2019 to March 2020
- We compared demographics, co-morbidities, days of antifungal use, length of stay (LOS) and mortality in patients with positive and negative assays

## Results

- 271 assays were performed from which 27 were positive
- 81 negative assays served as controls
- All patients had >1 risk factor for candidemia
- 53% of T2Candida assays had blood cultures drawn simultaneously
- 78% were positive for *C. albicans*/*C. tropicalis*, 11% for *C. glabrata*/*C. krusei* and 11% for *C. parapsilosis*
- Blood cultures were positive in 8 individuals
- All species in the T2Candida matched the blood cultures when available
- $\beta$ -D-glucan was positive in 82% of patients with positive T2 results vs 46% in the T2 negative group ( $p = 0.016$ )

## Demographics

Demographics and Comorbidities			
Factor	T2Candida Positive	T2Candida Negative	p value
Age	55.22	59.00	0.172
Male	15 (56)	61 (56)	0.466
Central Vascular Access	23 (85)	59 (73)	0.077
TPN <sup>1</sup>	10 (37)	19 (24)	0.087
History of Organ Transplant and/or LVAD <sup>2</sup> /TAH <sup>3</sup>	6 (22)	20 (25)	0.398
History of Abdominal Surgery or Perforation <sup>4</sup>	5 (19)	11 (14)	0.283
Neutropenic Fever	4 (15)	9 (11)	0.319
HIV <sup>5</sup>	0 (0)	10 (12)	0.106
Antifungal Administration	20 (74)	44 (54)	0.030
Antibiotic Administration	25 (93)	78 (96)	0.255

<sup>1</sup> Total Parenteral Nutrition

<sup>2</sup> Left Ventricular Assist Device

<sup>3</sup> Total Artificial Heart

<sup>4</sup> Within the prior 28 days

<sup>5</sup> Human Immunodeficiency Virus

## Cultures

Blood Cultures		
Patient	T2Candida Positive	T2Candida Negative
1	<i>C. tropicalis</i>	
2		<i>C. auris</i>
3		<i>C. albicans</i>
4	<i>C. albicans</i>	
5	<i>C. albicans</i>	
6	<i>C. glabrata</i>	
7	<i>C. glabrata</i>	
8		<i>C. albicans</i>
Sterile Cultures		
Patient	T2Candida Positive	T2Candida Negative
9	<i>C. albicans</i> <sup>1</sup>	
10	<i>C. glabrata</i> <sup>2</sup>	
11		<i>C. glabrata</i> <sup>3</sup>

<sup>1</sup> Intraabdominal abscess

<sup>2</sup> Peritoneal fluid

<sup>3</sup> LVAD graft

## Outcomes

Outcomes	T2Candida All N = 108 (%)	T2Candida Positive N = 27 (%)	T2Candida Negative N = 81 (%)	p value
Mortality	45 (42%)	11 (41%)	34 (42%)	0.456
ICU Admission	62 (57%)	14 (52%)	49 (60%)	0.223

Outcomes	Mean Days			
	T2Candida All	T2Candida Positive	T2Candida Negative	p value
LOS	45.19	46.41	44.78	0.450
ICU LOS	14.48	9.36	15.98	0.156
Antifungal days	9.59	17.55	5.98	0.004

- Antifungal administration at the time of assay collection was 54% in the negative group vs 74% in the positive group ( $p = 0.030$ )
- Mean duration of antifungal days were significantly lower in the negative group vs the positive group (5.98 vs 17.55 days,  $p = 0.04$ )

## Conclusions

- T2Candida was an effective diagnostic and antimicrobial stewardship tool, leading to testing in high risk patients and reducing unnecessary antifungal use
- Additional education is required for improved ordering of concurrent blood cultures
- Negative results should be interpreted with caution in suspected invasive candidiasis with consideration for species not included in the panel

## References

1. Clancy et al.; Finding the "Missing 50%" of Invasive Candidiasis: How Nonculture Diagnostics Will Improve Understanding of Disease Spectrum and Transform Patient Care; *Clin Infect Dis*. 2013 May;56(9):1284-92.
2. Matthew Morrell, Victoria J. Fraser, Marin H. Kollef; Delaying the Empiric Treatment of *Candida* Bloodstream Infection until Positive Blood Culture Results Are Obtained: a Potential Risk Factor for Hospital Mortality; *Antimicrobial Agents and Chemotherapy*; 2005