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Evaluation of candidemia prevalence and treatment cost comparison in a community-based hospital

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Background

- The Centers for Disease Control and Prevention (CDC) states that approximately 46,000 healthcare-associated *Candida* infections occur among hospitalized patients in the United States each year.
- Candidemia is among the most common causes of nosocomial bloodstream infections (BSIs) for hospitalized patients .[1]
- This disease state has been shown to increase length of stay, cost of hospitalization and has been associated with increased mortality rates.[2]
- It is estimated that each case of *Candida* infection results in 3-13 days of additional hospitalization, and a total direct healthcare cost of $6,000-$29,000.[3]

Objectives

1. Evaluate the prevalence of candidemia in patients with risk factors as specified by the current 2009 Infectious Diseases Society of America (IDSA) guidelines
2. Assess the appropriateness of therapy in patients with a diagnosis of candidemia
   - Appropriate antifungal and dose
   - Appropriate duration of therapy
3. Compare the cost of fluconazole versus micafungin at initiation of therapy

Methodology

- This retrospective study was approved by the Institutional Review Board for Baptist Health South Florida.
- An electronic report of all patients with positive *Candida* cultures, from 2010 to 2014, was generated by our laboratory department.
- A chart review was conducted to verify a blood culture positive for *Candida*, assess appropriateness of treatment as specified by the IDSA guidelines, and identify the following risk factors:
  - ❖ The use of broad spectrum antibacterial agents
  - ❖ The use of central venous catheters
  - ❖ Receipt of parenteral nutrition
  - ❖ Receipt of renal replacement therapy by patients in ICUs
  - ❖ Neutropenia (ANC < 1500/µL)
  - ❖ The use of implantable prosthetic devices
  - ❖ Receipt of immunosuppressive agents
- Treatment appropriateness was based on isolate, severity of illness, presence of neutropenia, and recent azole exposure.
- Cost of fluconazole versus micafungin at initiation of therapy was compared.

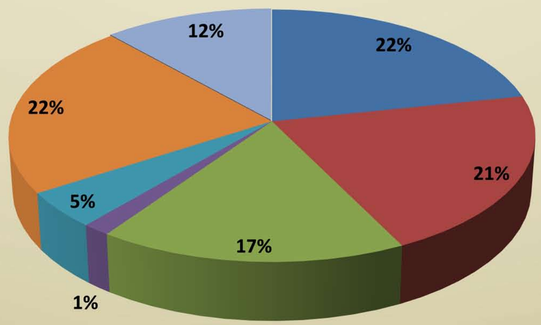
Results

Patient Characteristics

N = 44	
Female	20 (45%)
Male	24 (55%)
Mean (Range)	
Age (years)	61 (24 – 84)
Length of Stay (days)	49 (6-311)
Illness Severity N (%)	
Moderately Severe to Severe	27 (61)
Less Critical	17 (39)

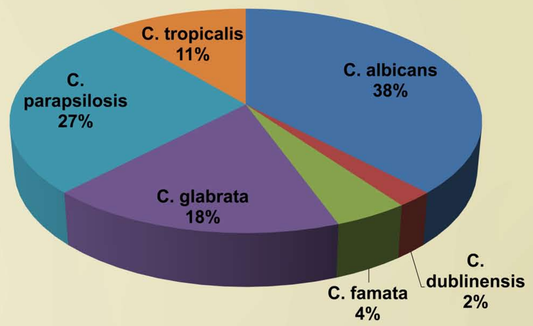
Moderately severe to severe is defined as admission into the intensive care unit during hospitalization.

Prevalence of Risk Factors



† 4 patients underwent hemodialysis, 1 underwent peritoneal dialysis, and 1 underwent continuous renal replacement therapy.

Candida Isolates



Assessment of Therapy

N = 44	Appropriate	Not Appropriate
Therapy (%)	28 (63.6)	16 (36.4)
***Antifungal (%)**		
Fluconazole (N = 20)	12 (60)	8 (40)
Micafungin (N = 40)	32 (80)	8 (20)
***Dose (%)**		
Fluconazole (N = 20)	15 (75)	5 (25)
Micafungin (N = 40)	39 (97.5)	1 (2.5)
Mean (Range)		
Duration of Therapy	15 (2-123)	

* Some patients were transitioned between fluconazole and micafungin, as well as micafungin to fluconazole.

Cost Comparison

Adjustment of Therapy	Number of Patients	Savings
Micafungin to Fluconazole	8	$3820
Fluconazole to Micafungin	8	- $3446
Total Savings		$374

Fluconazole: $ Micafungin: $$$

Discussion

- The prevalence of candidemia in our facility was predominately attributed to the use of implantable prosthetic devices, broad-spectrum antibiotics, and central venous catheters.
- On average, moderate to severely ill patients had a higher prevalence of candidemia.
- The most prevalent isolates were *Candida albicans* and *parapsilosis.*
- Of the 36.4% of patients that were inappropriately treated, one patient received antifungal therapy for 123 days and thus skewed our cost analysis.
- When assessing antifungal therapy, fluconazole and micafungin were inappropriately prescribed based on IDSA guidelines at 40% and 20%, respectively.
- Fluconazole and micafungin were inappropriately dosed at 25% and 2.5%, respectively.
- The average length of treatment was 15 days.

Conclusion

- The results of this study will be presented at our Antimicrobial Stewardship Committee and Pharmacy & Therapeutics Committee.
- We will be conducting an educational campaign with our healthcare providers in order to reinforce appropriate prescribing criteria for candidemia based on IDSA guidelines .

Limitations

- Small sample size
- Only patients treated with micafungin or fluconazole were assessed.
- Unable to evaluate duration of therapy for patients discharged on antifungal therapy.
- Severity of illness was not defined in the 2009 IDSA guidelines.

References

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Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

Bertha P. Rojas: Nothing to disclose
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