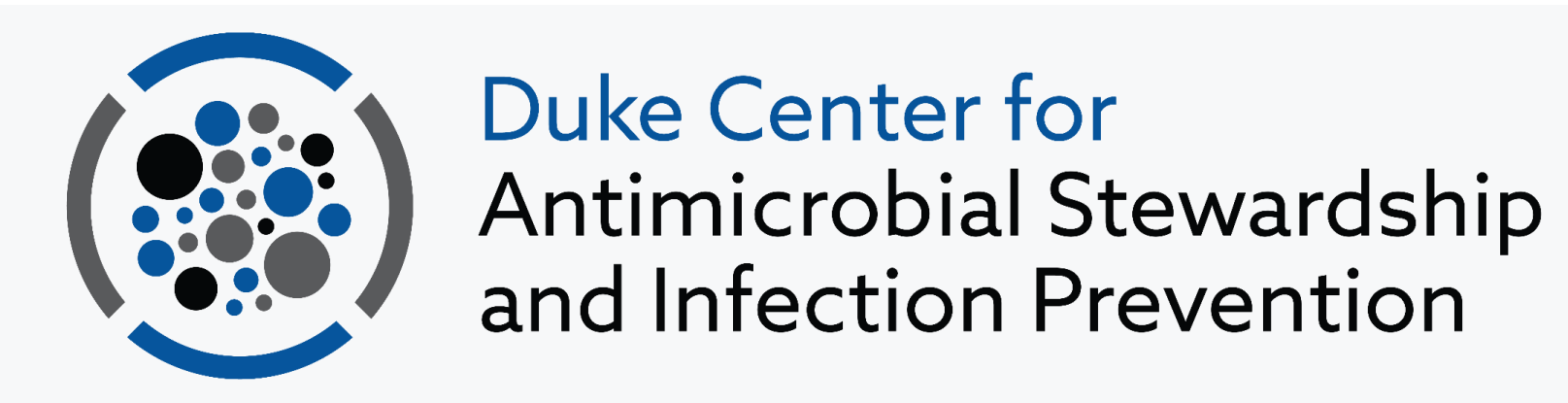


Impact of Concurrent Renal Replacement Therapy on Treatment Outcomes of Candidemia in Adults

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Abstract
Background: Treatment of candidemia is complex. Current guidelines recommend initial echinocandin therapy may be followed by fluconazole (if susceptible).¹ Studies examining relationships between patient-related factors and treatment outcome are limited, often based on all-cause mortality. Our objectives were to compare concurrent pre-specified factors between patients with and without treatment failure among adults with candidemia at Duke University Hospital (DUH).
Methods: This IRB-approved, single-center case-cohort study included patients ≥ 18 years old admitted between June 1, 2013 and June 1, 2017 with a blood culture positive for *Candida* spp.. Treatment-, patient-, and disease-specific data were collected, and outcome (success/failure) determined 90 days after the index culture. An odds ratio (OR) and 95% confidence interval (95% CI) were determined for receipt of renal replacement therapy (RRT), fluconazole, ICU stay, and neutropenia between outcome groups.
Results: Among the 112 encounters (from 110 unique patients) included, treatment success was observed in 104/112 (92.9%). Demographics were comparable between treatment success and treatment failure groups. Patients received concomitant RRT during 12 encounters, 11 (91.7%) were successfully treated. No significant differences were observed with regards to treatment failure with a fluconazole-containing regimen (OR, 1.72; 95% CI, 0.33-8.99) and ICU stay (OR, 1.43; 95% CI, 0.32-6.29).
Conclusion: Treatment success occurred in 91.7% of adult patients receiving concomitant RRT while undergoing treatment for candidemia. Treatment with a fluconazole-containing regimen, RRT, ICU stay, and neutropenia did not differ between treatment outcome groups.

Introduction
 Limited data exist describing impact of patient- and drug-related factors on treatment outcomes of candidemia in adult patients. In order to optimize treatment selection, we sought to identify such factors.

Objectives
Primary

- To compare the incidence of concurrent RRT between patients with and without treatment failure among adult patients with candidemia

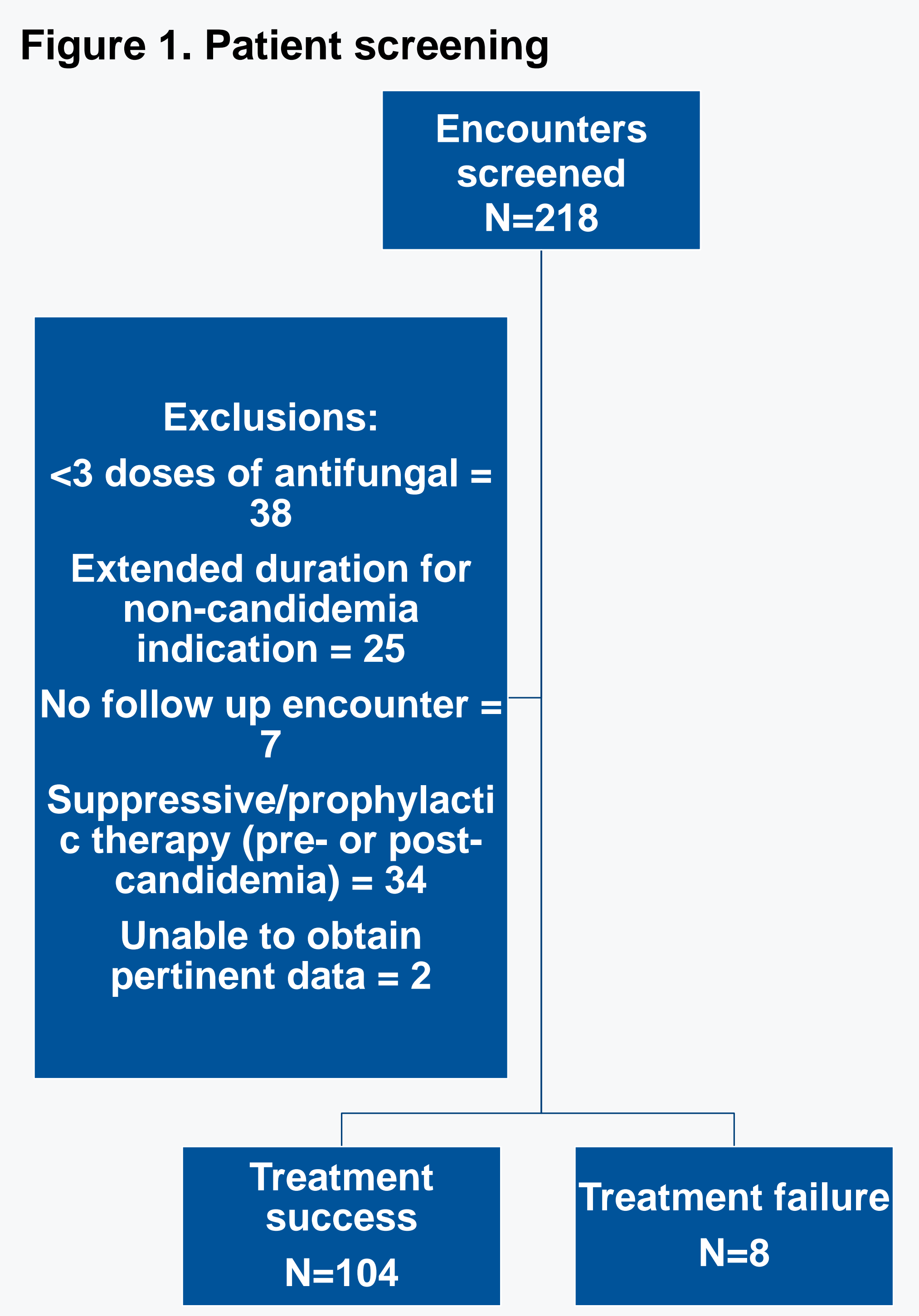
Secondary

- To compare the incidence of the following between patients with and without treatment failure:
 - Treatment with a fluconazole-containing regimen
 - ICU admission
 - Neutropenia

Methods

- Study design: Single-center, retrospective case-cohort

Inclusion	Exclusion
<ul style="list-style-type: none"> Patients ≥ 18 years of age Admitted to DUH between June 1, 2013 and June 1, 2017 At least one positive blood culture for <i>Candida</i> species Minimum of 3 doses of appropriate antifungal therapy Follow-up encounter >7 days and within 90 days from completion of antifungal therapy 	<ul style="list-style-type: none"> Incomplete medical records for the primary endpoint Prolonged duration of antifungal therapy for treatment of non-candidemia infection Prophylactic or suppressive antifungal therapy following treatment
Primary Analysis	Secondary Analysis
<ul style="list-style-type: none"> Endpoint: treatment failure Characterized by odds ratio (± 95% confidence interval) and compared using Chi-square or Fisher's exact test 	<ul style="list-style-type: none"> Endpoint: treatment failure Characteristics with p≤0.20 between treatment outcome groups included in multivariable logistic regression model



Results
Table 1. Patient demographics by treatment outcome

Parameter	Treatment Success N = 104	Treatment Failure N = 8	All Patients N = 112
Race, n (%)			
Caucasian	66 (63.4)	3 (37.5)	69 (61.6)
African American	33 (31.7)	4 (50.0)	37 (33.0)
Other/not reported	1 (1.0)	0 (0.0)	1 (0.9)
Multiracial	2 (1.9)	0 (0.0)	2 (1.8)
American Indian or Alaskan native	1 (1.0)	0 (0.0)	1 (0.9)
Other	1 (1.0)	1 (12.5)	2 (1.8)
Male, n (%)	60 (57.7)	4 (50.0)	64 (57.1)
Age at arrival, yrs			
Median	56.8	52.8	56.0
Range	18.7 – 91.7	20.3 – 61.5	18.0 – 91.7
Discharge Disposition, n (%)			
Expired	25 (24.0)	2 (25.0)	27 (24.1)
Federal hospital	1 (0.9)	0 (0.0)	1 (0.9)
Home health service	23 (22.1)	3 (37.5)	26 (23.2)
Home or self care	22 (21.2)	1 (12.5)	23 (20.5)
Hospice (home)	3 (2.9)	0 (0.0)	3 (2.7)
Hospice Inpatient	6 (5.8)	1 (12.5)	7 (6.3)
Left against advice	1 (0.9)	0 (0.0)	1 (0.9)
Long Term Acute Care	8 (7.7)	0 (0.0)	8 (7.1)
Rehab Facility	1 (0.9)	0 (0.0)	1 (0.9)
Skilled Nursing Facility	14 (13.5)	1 (12.5)	15 (13.4)

Table 2. Causative organisms by treatment outcome

Causative Organism	Treatment Success, n* (%)	Treatment Failure, n (%)	All Patients, n*(%)
<i>C. albicans</i>	37 (34.6)	5 (62.5)	42 (36.5)
<i>C. dubliniensis</i>	2 (1.9)	0 (0.0)	2 (1.7)
<i>C. glabrata</i>	41 (38.4)	3 (37.5)	44 (38.3)
<i>C. krusei</i>	1 (0.9)	0 (0.0)	1 (0.9)
<i>C. lusitanae</i>	1 (0.9)	0 (0.0)	1 (0.9)
<i>C. parapsilosis</i>	12 (11.2)	0 (0.0)	12 (10.4)
<i>C. tropicalis</i>	12 (11.2)	0 (0.0)	12 (10.4)
<i>C. pelliculosa</i>	1 (0.9)	0 (0.0)	1 (0.9)

*3 patients had >1 organism isolated

Results
Table 3. Univariate analysis of risk of treatment failure in select subgroups

Characteristic	Failure #failed/#exposed (%)	Crude (unadjusted) Odds Ratio	95% Confidence Interval
RRT	1/12 (8.3)	1.21	0.14 – 10.75
Fluconazole-containing regimen	6/72 (8.3)	1.72	0.33 – 8.99
ICU Stay	5/61 (8.2)	1.43	0.32 – 6.29
Neutropenia	0/2 (0.0)	-	---

Discussion

- Overall success rate in the present study (92.9%) was higher than anticipated and rate of concomitant RRT (10.7%) was lower than anticipated compared to published literature²
- No characteristic investigated demonstrated statistical significance between outcome groups
- Although not statistically significant, 6/8 (75%) of treatment failures received a fluconazole-containing regimen. This should be investigated further in future trials

Limitations

- Limited exposure to pre-specified subgroups
- Reliance upon ICD-9/10 codes for RRT
- Restrictions of available data for assessment (i.e., ANC, RRT, MAR administrations)

Conclusion

- Concomitant RRT was present in 12 (10.7%) overall encounters and in 1 (12.5%) encounter with treatment failure
- Incidence of receipt of fluconazole-containing regimen, ICU stay, and neutropenia did not impact treatment outcomes of candidemia in adult patients

References

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