Infectious Diseases Consult Improves Management of Candidemia

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Background

- Candidemia is a bloodstream infection associated with a high morbidity and mortality.
- Complications of disseminated infection, including endocarditis and endophthalmitis can prove devastating if candidemia is not managed using a multifaceted approach.
- A positive impact of early infectious diseases consultation (IDC) for patients with bloodstream infections has been observed in the literature, with developing literature surrounding candidemia management.

Study Purpose: To characterize current candidemia management practices within Carilion Clinic and to evaluate the impact of IDC on patient outcomes.

Methods

Study Design

- Retrospective, observational cohort study.
- All patients aged ≥ 18 years with blood cultures positive for *Candida* species experiencing their first episode of candidemia between January 2014 to August 2020 were included.
- Exclusion criteria included death or transfer to palliative care plan within 48 hours from culture positivity, pregnancy, or cultures from outside of Carilion Clinic.

Primary Outcome

- Composite of 90-day all-cause mortality and recurrence of candidemia with index organism.

Secondary Outcomes

Receipt of Bundle Components
Receipt of antifungal with *in vitro* susceptibility
Source controlling procedure conducted
Repeat culture negativity
Underwent ophthalmologic evaluation
Echocardiographic imaging obtained

Patient Identification

- Recipients of IDC were identified through presence of infectious diseases consultation notes during admission with candidemia.

Statistical Analysis (SAS® Studio)

- Descriptive statistics: Continuous and categorical
- Categorical Data: Pearson Chi-Square or Fisher's Exact Test
- Continuous Data: Wilcoxon rank sum test
- Two-tailed *P*-value of <0.05 considered statistically significant in all analyses

Disclosure
Authors of this presentation have nothing to disclose regarding possible financial or personal relationships with commercial entities.

Results

Table 1. Demographics and Baseline Clinical Characteristics

Characteristic	No IDC (n=63)	IDC (n=131)	*P value*
Age (years), mean ± SD	62 (16.7)	55.9 (17.2)	0.025
Male sex, no. (%)	30 (47.6)	68 (51.9)	0.57
Previous hospitalization in past 3 months, no. (%)	27 (42.9)	62 (47.3)	0.68
Abdominal surgery in past 3 months, no. (%)	10 (15.9)	17 (13)	0.58
ICU at onset of candidemia, no. (%)	35 (55.6)	68 (51.9)	0.63
On vasopressor at onset of candidemia, no (%)	18 (28.6)	39 (30)	0.83
Hospital LOS (days), median (IQR)	17 (10 – 30)	22 (10 – 42)	0.10
Cardiothoracic surgery recipient, no. (%)	1 (1.6)	9 (7)	0.16

Table 2. Candidemia Characteristics

Characteristic	No IDC (n=63)	IDC (n=131)	*P value*
Healthcare-associated candidemia, no. (%)	29 (46)	71 (54.2)	0.28
Polymicrobial bloodstream infection, no. (%)	12 (19)	39 (30)	0.10
CVC present for at least 48 hours, no. (%)	42 (66.7)	94 (71.8)	0.46
CVC duration (days), median, (IQR)	9 (6 – 22)	10 (7 -16)	0.93
Candida Score ≥ 3, no. (%)	15 (23.8)	32 (24.4)	0.92
Causative Species			
C. albicans	29 (46)	63 (48.1)	0.78
C. glabrata	24 (38.1)	34 (26)	0.08
C. parapsilosis	3 (4.7)	15 (11.5)	0.18
C. tropicalis	4 (6.4)	8 (6.1)	1
C. krusei	0 (0)	3 (2.3)	0.3
Other	3 (4.8)	8 (6.1)	1

Candida Score: Severe Sepsis (2 points), TPN (1 point), Initial Surgery (1 point), Multifocal Candida Colonization (1 point)
Healthcare-associated candidemia: Candidemia onset ≥ 48 hours into admission

Figure 1. Source of Candidemia

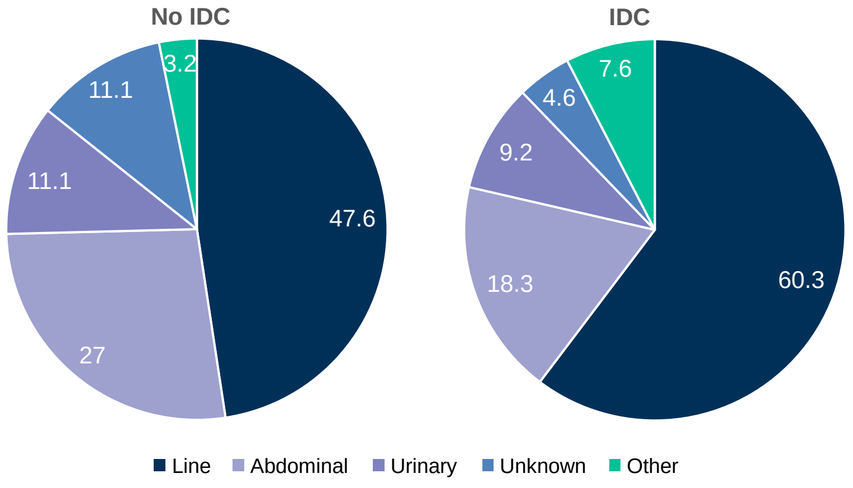


Table 3. Antifungal Utilization Characteristics

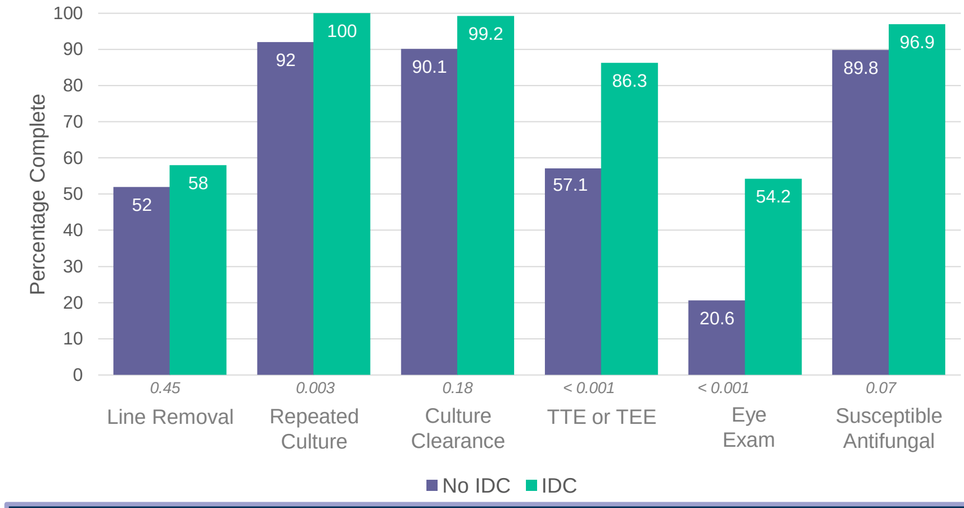
Characteristic	No IDC (n=63)	IDC (n=131)	*P value*
Received antifungal therapy, no. (%)	59 (93.7)	128 (97.7)	0.15
Time to susceptible antifungal (hours), median (IQR)	43 (27 – 61)	35 (27 – 52)	0.06
Early echinocandin therapy*, no. (%)	33 (52.4)	110 (84)	<0.001
Fluconazole recipients receiving loading doses, no. (%)	15 (35)	44 (55)	0.04
Fluconazole maintenance dose (mg/kg), median (IQR)	8.3 (3.8 – 12)	6.3 (3.1 – 7.1)	0.51
Treatment duration (days), median (IQR)	13.5 (10 – 15)	14 (13 – 16)	0.09

*Defined as initiation of an echinocandin within 72 hours of cultures turning positive for *Candida* species

Table 4. Clinical Outcomes

Outcome	No IDC (n=63)	IDC (n=131)	*P value*
90-day composite, no. (%)	22 (34.9)	28 (21.4)	0.04
90-day all cause mortality, no. (%)	19 (30.1)	28 (21.4)	0.18
All-cause in-hospital mortality, no. (%)	15 (23.8)	25 (19.1)	0.44
Fungal endocarditis found, no. (%)	1 (1.6)	14 (10.7)	0.04
Duration of candidemia (days), median (IQR)	2.59 (1.9 – 9.7)	1.97 (1.2 – 3.5)	0.001
Recurrence of candidemia within 90 days, no. (%)	3 (4.76)	0 (0)	0.03

Figure 2. Individual Bundle Outcomes



Conclusions

- The proportion of candidemia episodes that received IDC were noted to have increased over the study timeframe.
- A statistical difference was observed for the 90-day composite outcome of mortality and candidemia recurrence. Although not statistically significant, 90-day mortality alone was lower in the IDC cohort despite a higher rate of fungal endocarditis identified.
- The IDC cohort received significantly more comprehensive workup for signs of metastatic site involvement (echocardiographic imaging and ophthalmologic evaluation).