Table 1: Demographics of Patients Monoinfected with Babesiosis Versus Patients Coinfected with Babesiosis and Lyme Disease.

N= 40 **Only those Tested for Lyme	Infection		
	Babesiosis Monoinfection (N=22)	Babesiosis and Lyme Disease Coinfection (N=18)	P-Value
Mean Age (SD)	62.9 (15.0)	63.3 (15.1)	0.8597
Gender, n (%)			
Female	6 (27.27)	4 (22.22)	1.0000
Male	16 (72.73)	14 (77.78)	
Race, n (%)			
White/ Caucasian	14 (70.0)	11 (61.11)	0.7658
Hispanic	4 (20.0)	5 (27.78)	
Asian	1 (5.0)	0 (0.0)	
Other	1 (5.0)	2 (11.11)	
Admitted to Hospital, n (%)			
No	3 (13.64)	0 (0.0)	0.2385
Yes	19 (86.36)	18 (100.0)	
Length of Stay in days			
Median (IQR)	3.0 (2.0)	5.5 (5.0)	0.0295
ICU Admission, n (%)			
No	18 (81.82)	14 (77.78)	1.0000
Yes	4 (18.18)	4 (22.22)	
Hypertension, n (%)			
No	9 (69.23)	9 (64.29)	1.0000
Yes	4 (30.77)	5 (35.71)	
Diabetes, n (%)			
No	10 (76.92)	10 (83.33)	1.0000
Yes	3 (23.08)	2 (16.67)	
If Diabetic, Median HbA1c (IQR)	5.6 (0.90)	5.9 (2.3)	0.5412
Heart Conditions (CHF, CAD, Arrhythmias), n (%)			
No	8 (53.33)	9 (56.25)	1.0000
Yes	7 (46.67)	7 (43.75)	
Blood Disease, n (%)			
No	10 (90.91)	10 (83.33)	1.0000
Yes	1 (9.09)	2 (16.67)	
Cancer, n (%)			
No	8 (61.54)	10 (90.91)	0.1660
Yes	5 (38.46)	1 (9.09)	
Chronic Kidney Disease, n (%)			
No	10 (90.91)	9 (81.82)	1.0000
Yes	1 (9.09)	2 (18.18)	
COPD/Asthma, n (%)			
No	10 (83.33)	8 (61.54)	0.3783
Yes	2 (16.67)	5 (38.46)	
Liver Disease, n (%)			
No	10 (90.91)	11 (84.62)	1.0000
Yes	1 (9.09)	2 (15.38)	
Autoimmune Disease, n (%)			
No	10 (100.0)	9 (90.0)	1.0000
Yes	0 (0.0)	1 (10.0)	
Immunocompromised, n (%)			
No	11 (84.62)	11 (78.57)	1.0000
Yes	2 (15.38)	3 (21.43)	

Conclusion: It is remarkable that despite no differences in lab values on admission, comorbidities, and demographics, patients with a coinfection had a longer hospital stay than those with only babesiosis. This suggests that having a coinfection with babesiosis and LD may lead to a more severe illness than a single infection with babesiosis.

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747. Diagnostic Performance of Bronchoalveolar Lavage Fluid Galactomannan Assay in Patients with Negative Serum Galactomannan Assay Suspected with Invasive Pulmonary Aspergillosis

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Session: P-30. Eukaryotic Diagnostics

Background: There are limited data in real clinical practice on the diagnostic value of BAL (bronchoalveolar lavage) fluid galactomannan (GM) assay in patients with suspected invasive pulmonary aspergillosis (IPA) who had negative serum GM results.

Methods: This study was performed at Asan Medical Center, a 2700 bed tertiary-care hospital in Seoul, South Korea between May 2008 and April 2019. All patients with suspected IPA whose serum GM assays revealed negative results and sequentially underwent BAL were enrolled in this study. Patients were classified as proven, probable, possible or not IPA by the revised 2019 EORTC/MSG definition.

Results: A total of 341 patients with suspected IPA including 4 proven IPA, 38 probable IPA, 107 possible IPA, and 192 not IPA were enrolled. Of these 341 patients, 107 (31%) with possible IPA were excluded from the final analysis. Of 42 patients with proven or probable IPA who had initial negative serum GM results, 24 (57%) revealed positive BAL GM results (n=24) or BAL fungal culture (n=8). Among the remaining 18 (43%), 2 (5%) were diagnosed as proven IPA by the histopathologic exam from transbronchial lung biopsy, 6 (14%) as probable IPA by subsequent sputum fungal culture, and 10 (24%) as probable IPA by repeated serum GM assay after BAL. Of 192 patients with not IPA, 14 (7%) revealed positive BAL GM results (n=14) or BAL fungal culture (n=8). The diagnostic performance of various tests is shown in Table 1.

Table 1. Diagnostic performance of various diagnostic tests in patients with suspected IPA who had negative serum GM results

Proven or Probable IPA vs Not IPA	Sensitivity % (n/N[a],95% CI)	Specificity % (n/N[b],95% CI)	PPV % (95% CI)	NPV % (95% CI)	Positive Likelihood (95% CI)	Negative Likelihood (95% CI)
BAL GM or fungal culture	57.1 (24/42, 42.2–72.1)	92.7 (178/192, 89.0-96.4)	63.2 (47.8–78.5)	90.8 (86.8–94.9)	7.8 (4.4–13.8)	0.46 (0.3–0.7)
BAL GM	57.1 (24/42, 42.2–72.1)	92.7 (178/192, 89.0-96.4)	63.2 (47.8–78.5)	90.8 (86.8–94.9)	7.8 (4.4–13.8)	0.46 (0.3–0.7)
Subsequent repeated serum GM	35.7 (15/42, 21.2–50.2)	92.7 (178/192, 89.0-96.4)	51.7 (33.5–70.0)	86.8 (82.2–91.5)	4.9 (2.6–9.4)	0.7 (0.6–0.9)
Sputum fungal culture	38.1 (16/42, 23.4–52.8)	97.4 (187/192, 95.1-99.6)	76.2 (58.0–94.4)	87.8 (83.4–92.2)	14.6 (5.7–37.7)	0.6 (0.5–0.8)
Tissue biopsy[c]	40.0 (4/10, 9.6–70.4)	100 (11/11, 100-100)	100 (100-100)	64.7 (42.0–87.4)	Not applicable	0.6 (0.4–1.0)

[a] Number of patients with a positive test result/number of patients tested among diagnosed as proven or probable IPA.

[b] Number of patients with a negative test result/number of patients tested among diagnosed as not IPA.

[c] Included transbronchial lung biopsy (n=3) and lobectomy (n=1).

Conclusion: Sequential BAL in patients with suspected IPA who had initial negative serum GM results provided additional diagnostic yield in about half of patients.

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748. Epidemiology and Outcomes of Invasive Fungal Infections Following Civilian Trauma

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Session: P-30. Eukaryotic Diagnostics

Background: Invasive fungal infections (IFI) following traumatic injury are devastating complications that threaten life and limb. In military combat wounds, post-traumatic IFI patients have up to 6 times higher mortality rates and 2.6-5.1 times higher rate of high-level amputations compared to non-IFI patients, though no such data exists for the civilian population. This study is the first cohort to analyze a post-traumatic civilian population for IFI, its epidemiology and outcomes.

Methods: We conducted a single-center retrospective cohort study of all trauma patients over the age of 18 years admitted to a large tertiary referral hospital between 2004 to 2015 who required surgery for their injury and had operative cultures submitted from their wounds. Patient demographics, comorbid conditions, mechanisms of trauma, environmental exposures, and laboratory data were included for analysis. Patients with positive culture for fungus from a site compatible with IFI were considered IFI patients. Data was analyzed using descriptive statistics with $p \leq 0.05$ considered significant.

Results: Our cohort includes 1,107 patients that met inclusion criteria. Of these, 120 patients had a positive culture for fungus, 454 patients had a positive culture for bacteria and 533 patients had no positive culture from a site of interest. Basic patient demographics, geographical setting of the trauma, and anatomical site of injury were not significantly associated with having a positive fungal culture. Necrosis was present in 19 (15.8%) IFI vs. 74 (7.5%) non-IFI patients (p=0.002). Soil contamination of a wound was present in 6 (5.0%) IFI vs. 11 (1.1%) non-IFI patients (p=0.001). 55.8% of 120 IFI wounds penetrated below fascial layers compared to 26.7% of 987 non-IFI wounds ($p < 0.001$).

Presence of IFI increased likelihood of requiring amputation (6.7% vs. 2.7%, p=0.02) and prolonged hospitalization >14 days (77.5% vs. 57.4%, $p < 0.001$) compared to those without.

Conclusion: IFI significantly increased patient risk for amputation and prolonged hospital length of stay following traumatic injury in a civilian population. Presence of IFI was associated with wounds penetrating below the fascial layer, presence of wound necrosis, and soil contamination of a wound.

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749. Impact of Infectious Disease Consultation in Patients with Candidemia: A Retrospective study, Systematic Literature Review and Meta-analysis

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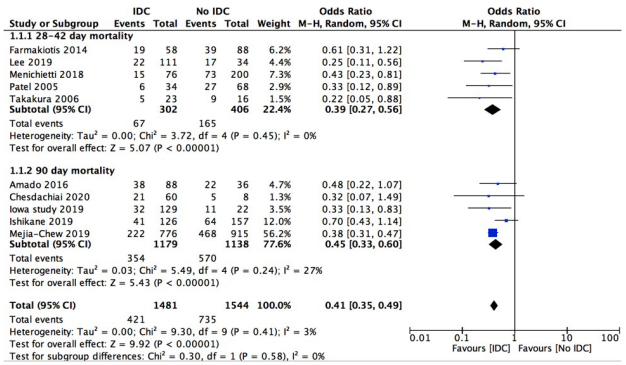
Session: P-30. Eukaryotic Diagnostics

Background: Morbidity and mortality from candidemia remain unacceptably high. While infectious disease consultation (IDC) is known to lower the mortality from *Staphylococcus aureus* bacteremia, little is known on the impact of IDC in candidemia.

Methods: We conducted a retrospective observational cohort study of candidemia patients at a large tertiary care hospital between 2015 and 2019. All patients aged ≥18 years with blood cultures positive for *Candida* species were included. We only included the first episode of candidemia. Exclusion criteria were death or transfer to the palliative care unit within 48 hours from the time cultures became positive. The crude mortality rate was compared between those with IDC and without IDC. Then, we systematically searched five publication-databases through February 2020 and performed a meta-analysis of the impact of IDC on mortality of patients with candidemia. The study protocol has been submitted to the International Prospective Register for Systematic Reviews (PROSPERO) database (ID 156939) on April 2020.

Results: A total of 151 patients at our institution met the inclusion criteria, 129 (85%) of whom received IDC. Thirty-day, and 90-day mortality rates were significantly lower in the IDC group (18% vs 50%, P = .002; 23% vs 50%, P = .0022, respectively). Our systematic literature review returned 216 reports, of which, 13 studies including ours fulfilled the inclusion criteria. Among the 13 studies with a total 3687 patients, IDC was performed in 49% of patients. Mortality numbers were available in 10 studies. Overall mortality was 38.2% with a significant difference in favor of the IDC group (28.4% and 47.6%) with a pooled relative risk of 0.41 [95% Cl 0.35-0.49]. Ophthalmology referral (61%; 790/1279 and 21%; 273/1304, P < 0.001), echocardiogram (54%; 662/1219 and 28%; 369/1296, P < 0.001), and central line removal (78%; 830/1069 and 61%; 686/1116, P < 0.02) were performed more frequently among patients receiving IDC.

Overall mortality



Conclusion: This study is the first systematic literature review and meta-analysis to evaluate the association between IDC and candidemia mortality. IDC was associated with a lower mortality and should be standard of care in all patients with candidemia.

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750. Isavuconazole Cerebrospinal Fluid Concentration in Refractory Coccidioidal Meningitis - A Three-Patient Case Series

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Session: P-30. Eukaryotic Diagnostics

Background: Coccidioidal meningitis (CM) causes life-threatening infection with limited treatment options. Small series have reported variable treatment success with isavuconazole. An absence of published data exists on cerebrospinal fluid (CSF) penetration of this agent.

Methods: Paired serum and CSF levels were measured on three patients with refractory CM treated on salvage isavuconazole therapy.

Results: 11 CSF levels were sent on 3 patients; 7 from ventricular sources (Ommaya reservoir or external ventricular drain) and 4 from lumbar punctures at 6-44 days after treatment initiation, 2-24.6 hours after oral or intravenous dose. All levels sent from ventricular sources were undetectable < 25μg/mL despite adequate paired serum levels (mean 2.45 μg/mL, range 1.25-6.38 μg/mL; n = 7 levels). Mean lumbar CSF levels were 1.00 μg/mL (range 0.45-1.72 μg/mL; n = 4 levels) with adequate serum levels (mean 3.57 μg/mL, range 1.78-5.63 μg/mL; n = 4 levels).

Table 1. Isavuconazole serum and cerebrospinal fluid concentration measurements

Table 1. Isavuconazole serum and cerebrospinal fluid concentration measurements

Day	Route	Serum μg/mL (hours post-dose)	CSF μg/mL (hours post-dose, source)
Patient 1			
9	IV	2.6 (24.8)	--
11	IV	1.96 (2)	<0.25 (2, EVD)
12	IV	1.49 (23)	<0.25 (23, EVD)
15	IV	1.78 (24.6)	0.45 (14.5, LP)
15	IV	--	<0.25 (24.6, EVD)
25	PO	1.25 (23.5)	<0.25 (23.5, Ommaya)
25	PO	3.08 (2.3)	<0.25 (2, Ommaya)
44	PO	1.8 (22.3)	0.69 (22.9, LP)
Patient 2			
6	IV	3.02 (5.7)	<0.25 (5.8, EVD)
Patient 3			
9	PO	3.3 (23.5)	--
10	PO	6.38 (2.7)	<0.25 (2.7, Ommaya)
11	PO	5.06 (24.5)	1.15 (24.5, LP)
42	PO	5.63 (7.5)	1.72 (6.5, LP)

CSF = cerebrospinal fluid; EVD = extra-ventricular drain; LP = lumbar puncture; RBC = red blood cells

Conclusion: Isavuconazole was detected in lumbar, but not ventricular CSF in three patients treated for CM.

Disclosures: **All Authors**: No reported disclosures

751. Karius Cell-Free DNA Metagenomic Assay of Plasma Detects Pulmonary and Disseminated *Trichosporon* Infections in Patients with Hematological Malignancies

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Session: P-30. Eukaryotic Diagnostics

Background: *Trichosporon* species are uncommon but emerging pathogens that cause life-threatening infections that are resistant to amphotericin B and echinocandins. Diagnosis of deeply invasive trichosporonosis is often elusive to conventional culture methods until locally advanced or disseminated disease has advanced.

CT scans Pulmonary Trichosporonosis

Revised figures not available at time of publication.
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