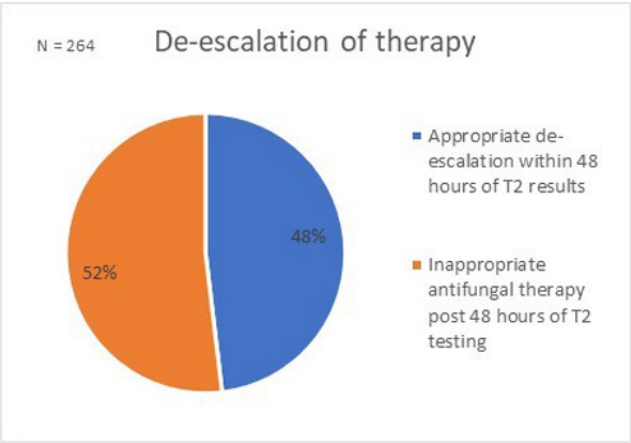

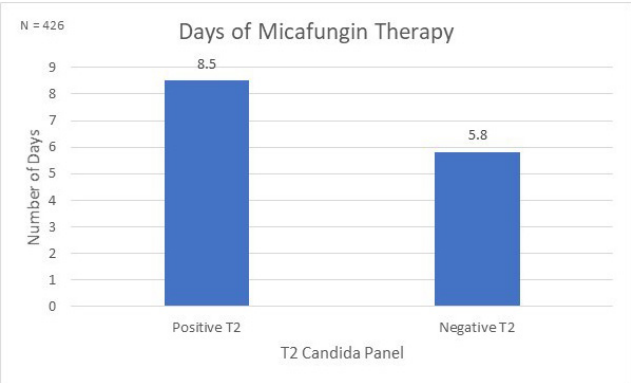

Disclosures. **All authors:** No reported disclosures.

257. Aspergillus Galactomannan Lateral Flow Assay for Rapid Diagnosis of Invasive Aspergillosis in Bronchoalveolar Lavage

Martin Hoenigl, MD; Sharon L. Reed, MD; Sanjay R. Mehta, MD; Nancy Law, MD; Saima Aslam, MD; Randy Taplitz, MD and Jeffrey D. Jenks, MD; University of California at San Diego, San Diego, California

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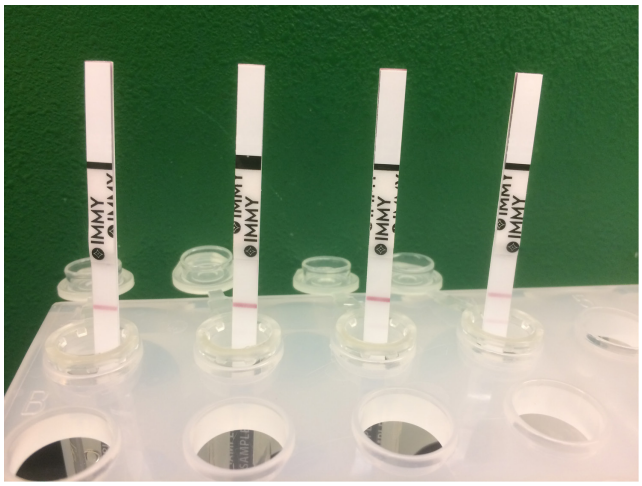
Background. Early diagnosis and treatment of invasive pulmonary aspergillosis (IPA) remain the most important factor to reduce mortality. Diagnosis remains a challenge, however, due to unspecific clinical presentation and radiological findings. Only very recently rapid tests for IPA have been developed. The objective of this study was to evaluate the performance of the new CE-marked Aspergillus Galactomannan Lateral Flow Assay (LFA; IMMY, Oklahoma, USA; figure) for IPA in patients with and without hematological malignancies.

Methods. The Aspergillus Galactomannan LFA was retrospectively performed according to the manufacturer's instructions in 106 previously frozen bronchoalveolar lavage fluid (BAL) samples from 106 patients at risk for IPA (23% with underlying hematological malignancies). Samples were collected between September 2016 and September 2018 at the University of California, San Diego. Performance of the LFA was compared with Galactomannan, BAL culture and the Aspergillus-specific LFD (another rapid test for IPA). IPA was classified according to revised EORTC/MSG criteria.

Results. Overall, 22 patients met criteria of probable or proven IPA, 9 possible IPA, while 75 patients did not fulfill criteria of IPA. Sensitivity of the Apergilllus Galactomanann LFA for probable/proven IPA was 77% (17/22). Sensitivity was similar to BAL GM (77% with a cutoff of 1.0 ODI), but higher compared with the Aspergillus-specific LFD (59%), and BAL culture (23%). The LFA resulted negative in 7/9 cases with possible IPA and 47/73 cases without IPA (overall specificity 66%, 54/82). The less than perfect specificity was driven particularly by non-neutropenic patients (specificity 62%, 43/69), while specificity was 85% among patients with underlying hematological malignancies. Lower specificity among non-neutropenic patients was also observed for the BAL GM (overall 77%, non-neutropenic patients 72%), the Aspergillus-specific LFD (overall 70%, non-neutropenic patients 67%) and BAL culture (overall 90%, non-neutropenic 88%).

Conclusion. Our study indicates that the LFA may be useful for rapid diagnosis of IPA in BALF when IPA is clinically suspected. The lower specificity in non-neutropenic patients may be explained by limited applicability of the EORTC/MSG criteria in those patients.



Disclosures. **All authors:** No reported disclosures.

258. False Negative Rate of T2Candida Assay in Blood Culture Positive Candidemia

Todd McCarty, MD[1]; Sixto M. Leal, Jr., MD, PhD[2]; Rachael A. Lee, MD [2]; Cameron White, MD, MPH[2] and Peter Pappas, MD[2]; [1]University of Alabama at Birmingham; Birmingham VA Medical Center, Birmingham, Alabama; [2]University of Alabama at Birmingham, Birmingham, Alabama

Session: 40. Fungal Diagnostics
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Background. The T2Candida (T2C) assay is an FDA-approved, non-culture-based rapid diagnostic that utilizes PCR and magnetic resonance technology to detect candidemia in a whole blood specimen. T2C can detect the 5 most common pathogenic species: *C. albicans*, *C. tropicalis*, *C. parapsilosis*, *C. krusei*, and *C. glabrata*. The sensitivity of T2C is reported to be 88–94%, varying by the species, based on the original clinical trial from 2015. Only 6 patients with candidemia were included in the study, so it was supplemented with samples spiked with known quantities of *Candida spp*. In this study, we sought to evaluate the sensitivity of T2C with routine usage in a tertiary-care academic hospital.

Methods. All patients with a blood culture (BC) positive for *Candida spp*. during the years 2016 through 2018 were identified. Repeat positive cultures of the same species within 30 days of the initial culture were excluded. We then reviewed the medical records of those patients with a T2C collected ±12 hours from the time of the BC collection. Data collection included demographics, time to antifungal therapy, time to culture reported positive, impact of false negative T2C on antifungal therapy, and 30-day mortality.

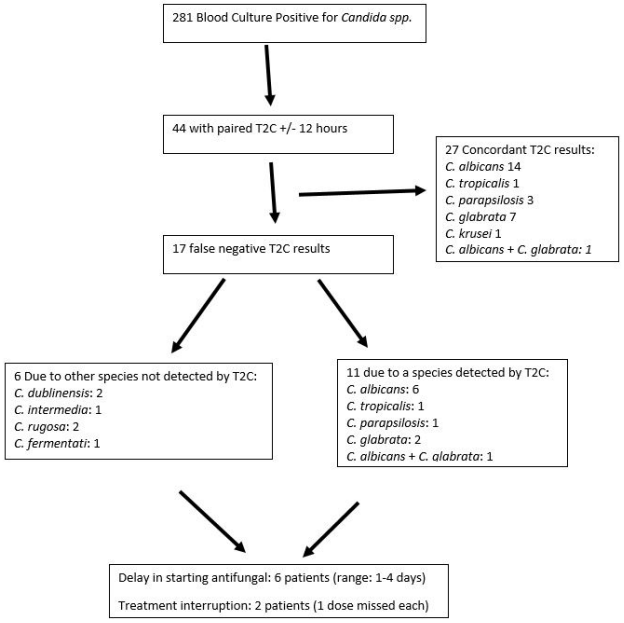
Results. There were 281 episodes of candidemia (designated as a positive blood culture) in the study period. Forty-four of these episodes had a T2C collected within the specified timeframe (Figure 1). Overall, there were 17 false-negative T2C, reflecting a sensitivity of 61% (27/44). Excluding species not detected by T2C, the sensitivity was 71% (21/38). Of the false-negative group, antifungal therapy was impacted in 8 patients: delayed initiation in 6 patients (1–4 days) and treatment interruption in 2 patients (1 dose each). Demographics, time to treatment, time to culture positivity, and 30-day mortality were similar in the two groups (Table 1).

Conclusion. In spite of the test being readily available and increasingly used, only 44/281 (16%) of patients with a positive BC had a T2C ordered concurrently. Our experience shows a much lower sensitivity than the clinical trial, in part due to species not detected by T2C. Considering only those organisms on the T2C panel, the false-negative rate was 29%. Impact on treatment was limited to half of the false-negative patients with no difference in mortality.

Table 1: Concordance of T2 negative testing with blood culture positivity (N = 44).

	Total N = 44	Concordant (T2 + /Blood culture +) N = 27	Discordant (T2 -/ Blood culture +) N = 17	P-value
Male, N (%)	28 (64)	16 (59)	12 (71)	0.53
Ethnicity • White • Black • Hispanic	 • 21 (48) • 22 (50) • 1 (2)	 • 12 (44) • 14 (52) • 1 (4)	 • 9 (53) • 8 (47) • 0 (0)	0.66
Age • Mean (SD) • Median (IQR)	 • 54 (14) • 55.5 (21)	 • 56 (14.5) • 60 (20)	 • 50.2 (13) • 51.5 (21)	0.17
Time to positive cultures, hours • Mean (SD) • Median (IQR)	 • 42.7h (19.2) • 36 h (17)	 • 45.1h (22.5) • 36h (23)	 • 38.8h (12.1) • 36h (16)	0.79
Time to antifungals, hours • Mean (SD) • Median (IQR)	 • 0.44 (0.82) • 0 (1)	 • 0.27 (0.45) • 0 (1)	 • 0.71 (1.16) • 0 (2)	0.32
30 day mortality, n (%)	14 (32)	9 (33)	5 (29)	0.79

Figure 1



Disclosures. **All authors:** No reported disclosures.

259. Racial Differences in Clinical Phenotype and Hospitalization of Blastomycosis Patients

Jennifer L. Anderson, BS[1]; Holly M. Frost, MD[2]; Jennifer P. King, MPH[1] and Jennifer K. Meece, PhD[1]; [1]Marshfield Clinic Research Institute, Marshfield, Wisconsin; [2]Denver Health and Hospital Authority, University of Colorado School of Medicine, Denver, Colorado

Session: 40. Fungal Diagnostics
Thursday, October 3, 2019: 12:15 PM

Background. Dimorphic fungal infections, such as blastomycosis, cause significant morbidity and mortality. Most studies describing blastomycosis have focused on non-Hispanic Caucasians and our understanding of the clinical presentation and outcomes for patients of other race/ethnicities is limited. We evaluated whether clinical presentation and disease severity varied across racial/ethnic groups.

Methods. Blastomycosis patients were identified from Marshfield Clinic Health System and patient data were abstracted from electronic medical records. *Blastomyces* genotyping was performed for cases with available isolates. Univariate analyses using χ^2 tests and multivariate logistic regression modeling were used to determine the association of race/ethnicity with clinical presentation. Significance was defined as $P \leq 0.05$.

Results. In total 477 patients were included.Age differences were observed across race/ethnicity categories ($P < 0.0001$). Non-Hispanic, Caucasians were oldest (47 years, SD 20) and Asians were the youngest (30 years, SD 18). Underlying medical conditions were more common in non-Hispanic Caucasians (55%) and African Americans (AA) (52%) than Hispanic Caucasians (27%) and Asians (29%, $P = 0.0002$). Risk for hospitalization was highest for Hispanic Caucasian (aOR 2.9, 95% CI 1.2–1.7), American Indian Alaskan Native (AIAN) (aOR = 2.4; 95% CI 1.0–5.5), and Asian (aOR = 1.9; 95% CI 1.0–3.6) patients when compared with non-Hispanic Caucasian patients. Ninety percent of *B. dermatitidis* infections occurred in non-Hispanic Caucasians whereas blastomycosis in Hispanic Caucasian, AIAN, and Asian patients was frequently caused by *B. gilchristii* ($P < 0.0001$).

Conclusion. Hispanic Caucasian, AIAN, and Asian blastomycosis patients were younger and healthier, but more frequently hospitalized. Patients in these racial/ethnic groups may need more aggressive treatment and closer therapeutic monitoring. Underlying host factors along with organism virulence likely play a role in these differences.

Disclosures. **All authors:** No reported disclosures.

260. Detection of Aspergillus fumigatus Infection in Mice with 2-Deoxy-2-[18F] fluorosorbitol

Yohan Yu, MD[1]; Seung ji Kang, MD[2]; Dong-Yeon Kim, PhD[3]; Ayoung Pyo, PhD[3]; Sehyeon Ji, Master[2]; Baigali Chuluunkhuu, MD[2]; Soosung Kim, MD[4]; Sung un Shin, MD[4]; Tae Hoon Oh, MD[4]; Uh Jin Kim, MD[5]; Seong Eun Kim, MD[4]; Hee-Chang Jang, MD, PhD[5]; Kyung-Hwa Park, MD, PhD[5]; Sook In Jung, MD, PhD[4] and Jung-Joon Min, MD, PhD[3]; [1]Infectious Diseases, Kangju, Kwangju-jikhalsi, Republic of Korea; [2]Chonnam National University Hwasun Hospital, Hwasun-gun, Cholla-namdo, Republic of Korea; [3]Chonnam National University Medical School and Hwasun Hospital, Hwasun-gun, Cholla-namdo, Republic of Korea; [4]Chonnam National University Hospital, kwangju, Kwangju-jikhalsi, Republic of Korea; [5]Chonnam National University Hospital, Kangju, Kwangju-jikhalsi, Republic of Korea

Session: 40. Fungal Diagnostics
Thursday, October 3, 2019: 12:15 PM

Background. Invasive aspergillosis is a major cause of infectious morbidity and mortality in immunocompromised patients.However, definitive diagnosis of invasive Aspergillus infection is still difficult due to the lack of a rapid, sensitive and specific diagnostic methods. In this studies, we investigated 2-deoxy-2-[^{18}F]fluorosorbitol ([^{18}F]FDS) which has been reported to be accumulated in Gram-negative bacteria but not in Gram-positive bacteria or healthy mammalian or cancer cells, for the imaging detection of *Aspergullus fumigatus* infections with PET *in vivo*.

Methods. [^{18}F]FDS was synthesized by reduction of 2-deoxy-2-[^{18}F]fluoro-D-glucose ([^{18}F]FDG) using $NaBH_4$. When the reaction was complete, the mixture was adjusted to a pH value to 6.5–7.5. Subsequently, the solution was filtered directly into a sterile product vial through a Sep-Pak Alumina N cartridge with a sterile filter. The probe uptake assay was performed by incubating bacterial cell and fungi with [^{18}F] FDS (20 μCi) at 37°C for 2 h. Female BALB/c were immunosuppressed with cyclophosphamide and cortisone acetate prior to *A. fumigatus* intranasal, intramuscular, brain infection. The mircoPET images were obtained at 2 h after *i.v.* injection of [^{18}F] FDS in infected mice.

Results. In vitro uptake test revealed significantly higher accumulation of [^{18}F]FDS at 2 hin *A. fumigatus, C. albicans* and *R. oryzae* rather than with bacterial strains (Figure 1). PET imaging of BALB/c mice with pulmonary *A. fumigatus* infections showed obvious accumulation of [^{18}F]FDS in the infected lungs compared with control (Figure 2). [^{18}F]FDS PET imaging also detected *A. fumigatus* muscle and brain infection in mice. In infected shoulder muscle of mice, [^{18}F] FDS PET imaging showed high legion-to-background ratio at 2 h. (4.05 ± 1.59, Figure 3).

Conclusion. [^{18}F]FDS PET study demonstrated stable uptake in infected tissue with *A. fumigatus* and rapid clearance from the blood and other organs. [^{18}F]FDS could be a useful imaging probe visualizing the invasive aspergillosis *in vivo*.

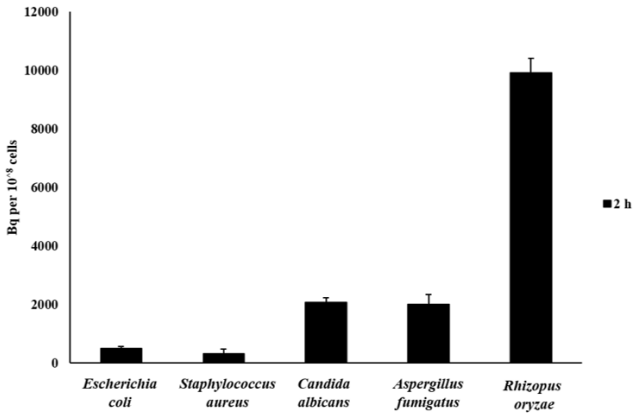


Figure 1. In vitro uptake of [^{18}F]FDS in *Escherichia coli* (positive control), *Staphylococcus aureus* (negative control), *Aspergillus fumigatus*, *Candida albicans* and *Rhizopus oryzae* after 2 hours of incubation.

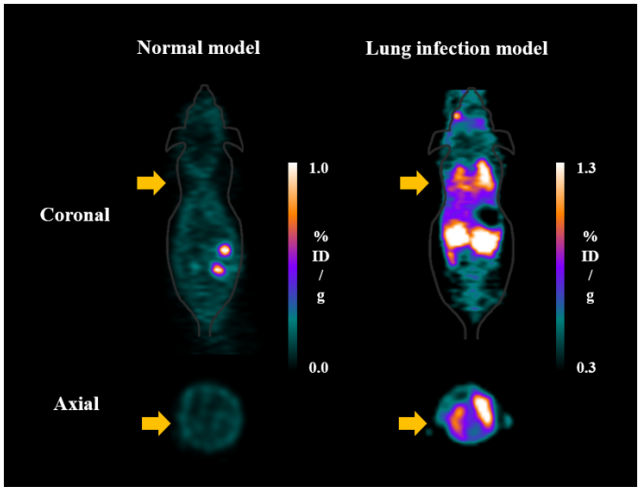


Figure 2. Coronal (upper) and transaxial (lower) images of a normal and lung infection model with *Aspergillus fumigatus* (yellow arrow) at 2 h post-injection of [^{18}F]FDS.