Table 1. Characteristics of Breakthrough IFI Among Hematologic Malignancy Patients Receiving ISA Prophylaxis

| Age/Gender | Disease | IFI Site | Organism | Neutropenia | ANC Nadir | Duration (days) | Duration (SA days) | Outcome (12 weeks) |
|------------|---------|---------|----------|-------------|-----------|-----------------|-------------------|-------------------|
| 32M | AML | Lung | Aspergillus fumigatus | BAL; fungal culture | <10 | 118 | 38 | Death |
| 65M | Aplastic Anemia | Blood | Scedosporium | Blood culture | <100 | 14 | 13 | Death |
| 44F | ALL | Lung | Aspergillus nidulans | Lung FNA; PCR path | 0 | 143 | 52 | Partial response |
| 63F | AML | Lung | Unknown* | Lung FNA | 110 | 90 | 73 | Partial response |

*Probable IFI; other threecases were proven.

Conclusion. We demonstrate a 12% rate of breakthrough IFI among hematologic malignancy patients on ISA prophylaxis, similar to published rates (10–15%) on posaconazole prophylaxis. Further study is needed to characterize risk factors for and epidemiology of ISA breakthrough.

Disclosures. S. B. Doernberg, Genentech; Consulting, Consulting fee.

416. Culture-Documented Invasive Mold Infections (cIMIs) at MD Anderson Cancer Center (MDACC) in Houston, Texas Pre- and Post-Hurricane Harvey

Thursday, October 4, 2018: 12:30 PM

Background. Hurricane Harvey caused record flooding in late August 2017. As flood damage causes mold overgrowth, excess rates of IMIs in immunocompromised cancer patients is of concern. Method. We compared the rates (patient-1,000 days) of cIMIs (EORTC/MSG criteria), in the period 7 months preceding and 7 months following hurricane Harvey, diagnosed in cancer patients at our institution. We focused on the four molds (Aspergillus, Fusarium, Scedosporium) that account for the vast majority of cIMIs in our patient population.

Results. No changes in cIMI rates (0.184 pre-Harvey vs. 0.171 post-Harvey, P = NS) and mold distribution as causes of IMIs were seen (table). No increased cases of cIMIs were encountered amongst different services (table), including patients with lymphoma/multiple myeloma or solid tumors (40% pre-Harvey vs. 31% post-Harvey, P = NS).

Conclusion. Despite concerns for extensive environmental mold exposure after Hurricane Harvey, we did not detect increased rates of cIMIs nor the emergence of unusual molds as causes of IMIs in high-risk cancer patients at MDACC, including in patients with solid tumors, where mold-active prophylaxis is not used. Whether excess IMI cases not fitting the traditional diagnostic criteria (e.g., biomarker-positive, but culture-negative IMIs or pneumonias not requiring hospitalization were seen, requires further study.

| 417. Clinical Mycology in Latin America and the Caribbean: Diagnostic Capabilities and Antifungal Therapy
| Diego Falci, MD1; Alessandro Pasqualotto, MD2; Hospital de Clinicas de Porto Alegre, Porto Alegre, Brazil and 3Universidade Federal de Ciencias da Saude de Porto Alegre, Porto Alegre, Brazil
| Session: 56. Fungal Disease: Management and Outcomes
| Thursday, October 4, 2018: 12:30 PM

Background. No data are available about diagnostic capabilities and practice in clinical mycology in Latin America and the Caribbean.

Methods. Here, we conducted an online survey aimed to assess availability, routine diagnostic procedures and access to therapy. Contacts were made through LFIE initiative (Leading International Fungal Education), SBM (Brazilian Society of Infectious Diseases), BRAC (Brazilian Society of Clinical Analysis), and SBM (Brazilian Society of Microbiology) during the first 2018 trimester.

Results. We got 128 responses, each from a single healthcare institution. Countries included Brazil (96), Mexico (9), Colombia (5), Uruguay (3), Guatemala (3), Argentina (2), Chile (2), Paraguay (2), Venezuela (2), Barbados (1), Ecuador (1), Honduras (1), and Peru (1). Most frequent institution profiles were public (38%), private (14%), and university hospitals (22%). Number of hospital beds varied between 12–3,000 (median 200 beds). ICU beds ranged 3–500 (15 beds). Most institutions provided care for hematology (63%) and HIV (31%) patients. Yeast identification was performed by biochemical tests (76%), automated methods (65%), and MALDI-TOF (15%). Twelve percent of responders had access to DNA sequencing. Almost a half (39%) of institutions did not undertake antifungal susceptibility tests, 47% did it only for yeasts, 2% molds. Fifteen (12%) institutions performed antifungal susceptibility tests routinely for all fungals isolates. Automated methods were the most frequently used antifungal susceptibility methodology (38%). Eighty-two (64%) institutions had no access to therapeutic drug monitoring (TDM). Cryptococcal antigen testing was available for 75% of responders.

Conclusion. This survey was the largest and most updated snapshot of the clinical mycology scenario in Latin America and Caribbean. Efforts should be made to improve diagnostic capabilities and equalize regional disparities.

Disclosures. All authors: No reported disclosures.

418. Evaluation of β-Glucan (BG) and Galactomannan (GM) Detection Assays in the Diagnosis of Invasive Fungal Infections in High-Risk Pediatric Cancer Patients

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Thursday, October 4, 2018: 12:30 PM

Background. Diagnosis IFD in pediatric patients is challenging: cultures are often negative and diagnostic efficacy of biomarkers such as β-glucan assay (BG) and galactomannan assay (GM) is unclear. The 2017 International Pediatric Fever and Neutropenia Guideline Panel recommended against the use of fungamic biomarkers for the diagnosis of IFD in pediatric patients.

Methods. We conducted a retrospective chart review of pediatric oncology patients admitted to the Children’s Memorial Hospital between July 2000 to December 2016 to determine the utility of BG and GM for diagnosis of IFD. Inclusion criteria: neutropenic fever (FN), high risk for IFD (fever >5 days unresponsive to antibiotics or recurrent fever with persistent neutropenia), and ≥1 fungal biomarker sent. IFD was diagnosed using EORTC/MSG criteria with patients divided to two groups: “Proven” or “likely” and “less likely or unlikely.” Data pertaining to possible causes of false-positive BG and GM were collected: presence of bacterial infection, receipt of immunoglobulin (IVIG), albu- min or certain antibiotics (i.e., ampicilin/sulbactam or piperacillin/tazobactam).

Results. Of 667 FN episodes (FNEs), 116 FNEs in 74 patients were considered high-risk for IFD and had ≥1 biomarker sent. BG was sent on 76 FNEs and GM on 115 FNEs. Underlying diagnoses included: Acute lymphoblastic leukemia (43 cases (35%)), acute myeloid leukemia (27 (24%)), lymphoma (12 (10%)), solid tumors (24 (20%), others (6) (5%)). Overall, 59 (51%) cases underwent stem cell transplant. Of 15 deaths, five were related to fungal infection. Sensitivity, specificity, positive and negative predictive values for BG are 43%, 87%, 63% and 78%, respectively, and for GM 15%, 95%, 5% and 95%, respectively. Overall, 59 (51%) cases underwent stem cell transplant.

Conclusion. Despite concerns for extensive environmental mold exposure after Hurricane Harvey, we did not detect increased rates of cIMIs nor the emergence of unusual molds as causes of IMIs in high-risk cancer patients at MDACC, including in patients with solid tumors, where mold-active prophylaxis is not used. Whether excess IMI cases not fitting the traditional diagnostic criteria (e.g., biomarker-positive, but culture-negative IMIs or pneumonias not requiring hospitalization were seen, requires further study.

419. Diagnostic Performance of Immunohistochemistry Test to Differentiate Micromycosporum From Formalin-Fixed Tissue Specimens

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**Session:** 56. Fungal Disease: Management and Outcomes  
**Thursday, October 4, 2018: 12:30 PM**

**Background.** Distinguishing aspergillosis from mucormycosis is clinically important as different antifungal agents are required. However, the sensitivity of fungal culture is suboptimal and histomorphologic diagnosis is not always accurate due to morphologic similarities. We investigated the diagnostic performance of immunohistochemistry (IHC) test for diagnosis of aspergillosis and mucormycosis.

**Methods.** Patients who met the criteria for mycologically proven aspergillosis or mucormycosis and in whom formalin-fixed, paraffin-embedded tissues were available were enrolled at a tertiary hospital from January 1992 to October 2017. Mycologically proven invasive fungal infections were defined as there were histologic evidence of tissue invasion of hyphae and the recovery of Aspergillus species or agents of mucormycosis (Rhizopus spp., Curvularia spp., Apophysomyces spp., Saksenaea spp., Absidia spp., Mucor spp.) by culture from sterile specimens. Anti-Aspergillus mouse monoclonal antibody (1:50; clone WF-AF-1; LSbio, WA, USA) and anti-Rhizopus arrhizus mouse monoclonal antibody (1:100; clone W33A-RA-1; LSbio, WA, USA) were used for IHC test, and we evaluated the diagnostic performance of IHC test using sensitivity and specificity.

**Results.** A total of 32 invasive fungal infection including 12 proven mucormycosis and 20 proven aspergillosis were analyzed. The fungal species from sterile sites and diagnostic performance of IHC test for these 30 patients were shown in Table 1.

**Conclusion.** The IHC test seems to be useful in compensating the limitations of histomorphologic diagnosis in distinguishing between aspergillosis and mucormycosis.

**Keywords.** Aspergillosis; Mucormycosis; Histomorphology; Immunohistochemistry

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**Table 1: Diagnostic Performance of Mucormycosis and Aspergillosis Immunohistochemistry Tests in Proven Mucormycosis and Proven Aspergillosis**

| IHC Test Result | Proven Mucormycosis, No. of Cases (n = 12) | Proven Aspergillosis, No. of Cases (n = 20) | Diagnostic Performance % (95% CI) |
|-----------------|-------------------------------------------|--------------------------------------------|----------------------------------|
| **Mucormycosis** |                                           |                                            |                                  |
| Positive        | 12                                        | 0                                          | Sensitivity: 100% (70–100)       |
| Negative        | 0                                         | 0                                          | Specificity: 100% (80–100)       |
| **Aspergillosis** |                                          |                                            |                                  |
| Positive        | 0                                         | 18                                         | Sensitivity: 90% (67–98)         |
| Negative        | 0                                         | 2                                          | Specificity: 100% (70–100)       |

**Abbreviations:** CI, confidence interval; IHC, immunohistochemistry.

**Disclosures.** S. H. Kim, the Korea Health Technology R&D Project through the Korea Health Industry Development Institute (KHIDI): Investigator, Grant recipient.

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**420. A Rapid PCR Assay Detects Fungemia Due to Mixed Candida Species That Is Missed by the Clinical Microbiology Laboratory**

**Session:** 56. Fungal Disease: Management and Outcomes  
**Thursday, October 4, 2018: 12:30 PM**

**Background.** As detected by blood cultures, _Candida_ spp. are often isolated along with _Candida_ spp. However, sensitivity of _Candida_ spp. cultures is suboptimal due to the formation of small colonies. In this study, we investigated the diagnostic performance of _Candida_ spp. blood culture bottles on solid agar at 48 hours. Thereafter, _C. parapsilosis_ formed smaller wrinkled colonies, comprised of a mixture of elongated and round cell morphologies, whereas _C. albicans_ demonstrated round small cells, and formed smooth, big colonies. In addition, _C. parapsilosis_ showed increased agar invasion and echinocandin resistance. _C. albicans_ had increased growth rate, biofilm formation and resistance to neutrophil killing.

**Conclusion.** Mixed _Candida_ spp. may account for more cases of fungemia than currently recognized by clinical laboratories. In some cases, failure to detect mixed _Candida_ spp. infections can have important clinical implications, including failure to appreciate antifungal resistance. It is possible that complementary phenotypic or virulence characteristics between isolates of different _Candida_ spp. may potentiate pathogenesis. More efficient methods of screening for mixed _Candida_ spp. infections are needed for clinical laboratories.

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

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**421. Babesiosis: Retrospective Review of 38 Cases from Upper Midwest**

**Session:** 57. Global Health and Travel Medicine  
**Thursday, October 4, 2018: 12:30 PM**

**Background.** Babesiosis is a tick-borne illness caused by protozoan infection of the genus _Babesia_. Babesia spp. can be detected in 6%–36% of candidemia. Our objective was to use molecular methods to better define the epidemiology of _Babesia_ spp. fungemia at our center.

**Methods.** _Babesia_ spp. infections were defined as _Babesia_ spp. isolates from sterile specimens. Anti- _Babesia_ mouse monoclonal antibody (1:50; clone W33A-RA-1; LSbio, WA, USA) was used for IHC test. We evaluated the diagnostic performance of IHC test using sensitivity and specificity.

**Results.** A total of 32 invasive fungal infection including 12 proven mucormycosis and 20 proven aspergillosis were analyzed. The fungal species from sterile sites and diagnostic performance of IHC test for these 30 patients were shown in Table 1.

**Conclusion.** The IHC test seems to be useful in compensating the limitations of histomorphologic diagnosis in distinguishing between aspergillosis and mucormycosis.

**Keywords.** Aspergillosis; Mucormycosis; Histomorphology; Immunohistochemistry

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**Table 1: Diagnostic Performance of Mucormycosis and Aspergillosis Immunohistochemistry Tests in Proven Mucormycosis and Proven Aspergillosis**

| IHC Test Result | Proven Mucormycosis, No. of Cases (n = 12) | Proven Aspergillosis, No. of Cases (n = 20) | Diagnostic Performance % (95% CI) |
|-----------------|-------------------------------------------|--------------------------------------------|----------------------------------|
| **Mucormycosis** |                                           |                                            |                                  |
| Positive        | 12                                        | 0                                          | Sensitivity: 100% (70–100)       |
| Negative        | 0                                         | 0                                          | Specificity: 100% (80–100)       |
| **Aspergillosis** |                                          |                                            |                                  |
| Positive        | 0                                         | 18                                         | Sensitivity: 90% (67–98)         |
| Negative        | 0                                         | 2                                          | Specificity: 100% (70–100)       |

**Abbreviations:** CI, confidence interval; IHC, immunohistochemistry.

**Disclosures.** S. H. Kim, the Korea Health Technology R&D Project through the Korea Health Industry Development Institute (KHIDI): Investigator, Grant recipient.

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**422. Brucellosis Regimens Comparison in a Saudi Tertiary Academic Medical Center**

**Session:** 57. Global Health and Travel Medicine  
**Thursday, October 4, 2018: 12:30 PM**

**Background.** Brucellosis is a zoonotic infectious disease caused by _Brucella_ spp. that affects multiple body systems and may lead to several complications. Saudi Arabia is one of the countries where _Brucella_ is endemic. The purpose of this study was to describe the epidemiological characteristics of _Brucella_ as well as assessing outcomes of different antibiotic regimens.

**Methods.** A retrospective cohort study was conducted in a Saudi tertiary academic medical center. Eligible patients were adults with confirmed brucellosis (via culture, antibody test, or both) seen between January 2008 and March 2018 who received antibiotic therapy. Data were analyzed using ANOVA and chi-square. A P-value of < 0.05 was considered statistically significant.

**Results.** Among 180 patients screened, 79 met the criteria and were included in the study. On the most common regimens prescribed, patients were divided into three groups, doxycycline–rifampin–aminoglycoside (DRA) with 39 patients, doxycycline–rifampin (DR) with 28 patients, and other regimens with 12 patients. All groups did not differ in their baseline characteristics except for the location (mostly outpatients or inpatients and very few in the intensive care unit), duration of therapy, and the presence of co-infection (most patients did not have co-infections). The most common risk factor was consumption of raw dairy products and most patients had...