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T2MR: A New Tool for Anti-Fungal Stewardship

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269. Epidemiology and Outcomes of Invasive Aspergillosis (IA) Among Pediatric Immunocompromised Patients: A 12-Year, Single-Center Experience
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Session: 40. Fungal Diagnostics
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Background. IA remains a leading cause of morbidity and mortality in immunocompromised children, and our understanding regarding epidemiology and outcomes of IA is limited and based on adult studies.

Methods. We conducted a retrospective evaluation of cases of proven or probable IA according to the 2008 EORTC/MSG criteria cared for at Boston Children’s Hospital from 2007 to 2019. We collected data including demographics, clinical characteristics, diagnosis modality, antifungal treatment, and survival. Survival curves over one year were estimated using the Kaplan–Meier method and univariate and multivariate Cox modeling was used to evaluate for risk factors for mortality.

Results. 67 patient cases were identified, 20 (30%) with proven IA and 47 (70%) with probable IA. The mean age at diagnosis was 11.9 years (6 months–28 years). Underlying conditions included hematopoietic-cell transplantation (HCT) in 45%, cancer in 21%, and solid-organ transplantation in 18%. Pulmonary IA was the most common (70.1%) presentation. Diagnostic modalities included positive microbiology alone (18%), fungal PCR alone (1.5%), galactomannan alone (28%), and multiple modalities for the remaining cases (52.5%). 44.8% of patients were neutropenic at diagnosis and 78.5% of patients with malignancies were receiving chemotherapy. Immunosuppressive drugs included glucocorticoids in 34.3%, calcineurin inhibitors in 31.3%, and IMDH inhibitors in 25.3%. Voriconazole was the most common treatment used (72%).

Conclusion. We demonstrate in our >10-year retrospective cohort analysis of immunocompromised hosts that IA is associated with 49% all-cause mortality with particular impact on the BMT population. No protective nor harmful association was also noted with a particular antifungal or immunosuppressive regimen.

Disclosures. All authors: No reported disclosures.
Of the negative tests, 1 patient had a false negative T2MR result despite blood cultures growing C. glabrata. There was only 1 invalid test in our sample. Thirty-six patients were initiated or maintained on anti-fungal therapy at the time of the T2MR test, with micafungin being the most commonly prescribed anti-fungal agent. Negative T2MR patients had a median anti-fungal therapy duration of 2 days (IQR, 0–16). Sixteen patients (44%) had their anti-fungal therapy discontinued within 1 day of the negative T2MR result. There were no patients with a negative T2MR result who subsequently developed candidemia within 30 days after T2MR testing.

**Conclusion.** Our study showcases the benefit seen with T2MR in curtailing unnecessary anti-fungal exposure. Study limitations include a small cohort and evaluation at a single center. There is an opportunity for this technology to be utilized in anti-fungal stewardship.

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

### 271. Fungal Diagnostic Studies in Histoplasmosis

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**Background.** Histoplasmosis (histo) is a common cause of invasive fungal infection in endemic regions and accurate diagnosis is difficult without direct tissue culture or pathology. Indirect fungal antigen testing for various fungal pathogens is typically performed to assist with diagnostic workup though cross-reaction can lead to difficulty interpreting results. We aimed to evaluate the prevalence of positive antigen testing for non-Idaho fungal pathogens in patients with proven invasive histo.

**Methods.** We performed a retrospective review of adult patients with proven invasive histo from 2010–2018 at our institution. For inclusion purposes, histo was confirmed by either fungal culture and/or cytology. Patient demographics, clinical characteristics and results of fungal antigen testing for Histoplasma, Blastomyces, Aspergillus, Cryptococcus and β-D-glucan were evaluated. Two different urine Histoplasma antigen assays were used during the study period.

**Results.** 57 (31%) of 182 patients diagnosed with histo during the study period had culture or cytology evidence of disease and were included in all further analysis. Thirty-two (56%) of these patients were male, 35 (61.4%) were Caucasian and the mean age was 50.1 years. HIV (20, 35%) and being on immunosuppressive medications (21, 37%) were common in this population. The majority of cases were classified as disseminated histo (40, 70%) followed by acute pulmonary (10, 18%) and chronic pulmonary (7, 12%) disease. Results of fungal antigen testing are documented in the table. Chi-squared analysis was performed.

**Conclusion.** There is a frequent cross reaction of non-Histoplasma fungal tests in patients with histo. In our review, there was a high rate of cross reaction with Blastomyces antigens, which can be confusing in regions where both pathogens coexist. Elevation of β-D-glucan was high in these patients. Urine Histoplasma antigen sensitivity was higher with MiraVista testing for disseminated disease in our review. While noninvasive fungal tests are helpful in diagnosis of these infrequent infections, clinicians must maintain knowledge of the clinical differences between these fungal pathogens and be aware of the limitations of these tests. A prospective study is needed to better define differences between individual Histoplasma tests.

**TABLE**

<table>
<thead>
<tr>
<th>Histopathological Presentation</th>
<th>Urine Histoplasma Antigen (%)</th>
<th>Urine Blastomyces Antigen (%)</th>
<th>Serum Cryptococcus Antigen (%)</th>
<th>Serum Aspergillus Antigen (%)</th>
<th>Serum β-D Glucan Antigen (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute pulmonary (n=19)</td>
<td>4/5 (80%)</td>
<td>0/0 (0%)</td>
<td>0/1 (0%)</td>
<td>0/2 (0%)</td>
<td>0/2 (0%)</td>
</tr>
<tr>
<td>Chronic Pulmonary (n=9)</td>
<td>0/4 (0%)</td>
<td>0/2 (0%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
</tr>
<tr>
<td>Disseminated (n=10)</td>
<td>3/11 (27%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
</tr>
<tr>
<td>Total (n=38)</td>
<td>7/34 (20%)</td>
<td>0/3 (0%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
<td>0/0 (0%)</td>
</tr>
</tbody>
</table>

*Chi square analysis.

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

### 273. Low Positive Predictive Value of β-D-Glucan in Hematology Patients Receiving Antimold Prophylaxis

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**Background.** Detection of β-D-glucan (BDG) in serum is recognized as the mycological evidence in the diagnosis of invasive fungal infection (IFI). However, its diagnostic value in low prevalence of IFI has not been elucidated. We aimed to examine the performance of BDG in hematology patients receiving antimold prophylaxis.

**Methods.** We retrospectively reviewed all BDG results performed for the purpose of diagnosis or surveillance for IFI in hematology patients receiving posaconazole or micafungin prophylaxis from January 2017 to February 2019 in a tertiary hospital. At least two consecutive positive results of BDG were regarded as positive BDG. All the episodes were classified into true-positive (TP, positive BDG with probable/proven IFI), true-negative (TN, negative BDG without probable/proven IFI), false-positive (FP, positive BDG without probable/proven IFI), false-negative (FN, negative BDG with probable/proven IFI), and nontuable (can’t be determined for the occurrence of breakthrough IFI). When BDG test was performed in the setting of persistent fever ≥72 hours in spite of broad-spectrum antibiotics or with a suspicion of IFI, it was defined as a diagnostic BDG episode, while others were defined as a surveillance BDG episode.

**Results.** Of a total of 140 episodes, 24 episodes were non-evaluable. Among 116 evaluable episodes, 75 received induction chemotherapy for acute leukemia or myelodysplastic syndrome, 35 underwent stem cell transplantation, and 10 had intensive treatment for graft-vs.-host disease. There were three episodes of probable/proven IFI (2.6%). Ninety-one (78.4%) were performed with diagnostic purpose, while 23 (21.6%) were performed for surveillance. TP, TN, FP, and FN were 2 (1.7%), 91, 22, and 1, respectively. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value were 66.7%, 80.5%, 8.3% and 98.8%, respectively. PPV was 13.3% and 0% in diagnostic and surveillance BDG episodes, respectively.

**Conclusion.** The PPV of BDG was low in hematology patients receiving antimold prophylaxis, even in the diagnostic-driven episodes. The routine screening of BDG is not helpful, and the BDG test may be used for exclusion of IFI rather than for diagnosis in these patients.