269. Epidemiology and Outcomes of Invasive Aspergillosis (IA) Among Pediatric Immunocompromised Patients: A 12-Year, Single-Center Experience

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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 are 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%). Twenty-two (33%) deaths occurred in the cohort attributable to IA (6 of which underwent autopsies and 4 had histopathological confirmation) Most deaths occurred in the BMT patients (15 patients, 45% of deaths). The 6 week mortality was 18% while the 12 week mortality was 25.4%. No antifungal or immunosuppressive regimen had a statistically significant impact on mortality.

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.

Total N= 67 of Proven and Probable IMI per EORTC definition		
	Proven IMI= 20 (30%)	Probable IMI=47(70%)
Gender		
Male	11	21
Female	9	26
Race		
Caucasian	13	31
African American	1	3
Hispanic/Latino	2	7
Asian/Pacific islander	2	1
Middle-Eastern	1	5
Other	1	
Underlying diagnosis		
SOT	4	8
BMT	9[1]	21[2]
Malignancy	6	8
PID	1	8
Rheumatologic/inflammatory diseases and Hyperimmune states		2
Other diseases/entities	1	1
Clinical site of infection		
Lung	12	16
Tracheobronchial		19
Sinus		3
Skin and soft tissue	4	1
CNS		2[3]
Abdominal	3[4]	1[5]
Skeletal	1	
Other		5[6]
Modality of diagnosis		
Microbiology alone	12	
Fungal PCR alone	1	
Histopathology alone	-	
Galactomannan alone	19	
Microbiology +pathology	7	
Microbiology + Galactomannan	6	
Fungal PCR and pathology	3	
Fungal PCR and Galactomannan	1	
Histopathology and Galactomannan	7	
Microbiology+Histopathology+ Galactomannan	10	
Microbiology+Pathology+Fungal PCR+Galactomannan	1	

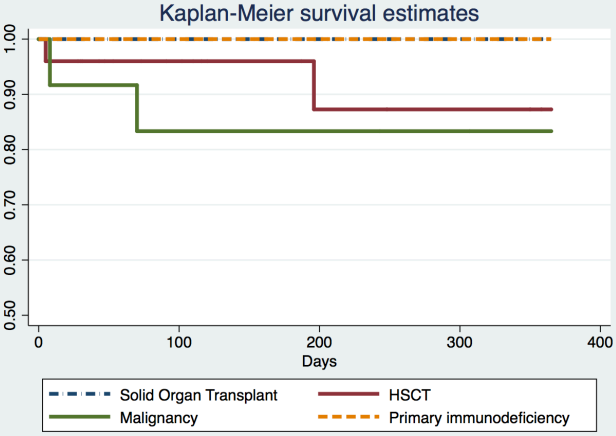
Table 1: Clinical and diagnostic characteristics

[1] One BMT patient had concomitant Lung transplant
[2] One BMT patient had concomitant Liver transplant
[3] Patient with CNS imaging concerning for IA in addition to positive galactomannan. Patient with CNS and lung radiographic imaging concerning for IA in addition to positive galactomannan.
[4] Aspergillus growing from peritoneal cavity, Aspergillus PCR positive from an omental biopsy, Aspergillus PCR positive from colon biopsy
[5] Radiographic liver lesions with positive galactomannan
[6] Aspergillus positive culture from a throat swab, with accompanying radiographic findings and positive galactomannan. 4 positive aspergillus cultures from sputum

	Hazards Ratio Unadjusted (95% CI)	**p-value**	**Hazards Ratio Adjusted (95% CI)**	**p-value**	**Average days of survival if patient died in one year (number of deaths)**	**Deaths n (%) (95% CI)**
BMT	1.29 (0.53-3.15)	0.56	1.17 (0.37-3.66)	0.78	56 days (15/67)	15 (50%) (.312-0.68)
Malignancy	0.71 (0.23-2.13)	0.54	.98 (0.30-3.18)	0.97	4 days (2/67)	2 (14%) (0.01- 0.42)
Primary Immune Deficiency	0.78 (0.26-2.34)	0.66	0.85 (0.16-4.33)	0.84	272 days (1/67)	1 (11%) (.00-0.48)
Solid Organ Transplant	--	--	--	--	0	0
Other immunocompromised conditions"	--	--	--	--	0	0
Usage of:					**Number (%) (95% CI)**	
Corticosteroids	1.12 (0.42-2.95)	0.82	1.07 (0.35-3.28)	0.90	21 (31.3%) (0.23-0.65)	
Calcineurin	0.79 (0.26-2.42)	0.69	0.41 (.08-1.90)	0.25	23 (34.3%) (0.21-0.65)	
IMDH	1.80 (0.60-5.33)	0.28	1.48 (0.39-5.60)	0.56	17 (25.3%) (0.01-0.98)	
Amphotericin	0.84 (0.28-2.56)	0.77	0.88 (0.19- 4.09)	0.87	23 (34.3%) (0.34- 0.76)	
Voriconazole	1.49 (0.34-6.5)	0.59	2.53 (0.32-19.65)	0.37	48 (71.6%) (0.59-0.82)	
Micafungin	0.26 (0.03- 2.03)	0.20	0.25 (0.03-2.03)	0.19	11 (16.4%) (0.30-0.89)	
	Number n (%)	**95% CI**				
6 week mortality	12 (18%)	(0.09-0.29)				
12 week mortality	17 (25.4%)	(0.16-0.37)				
Total deaths	33 (49%)	(0.37-0.62)				

*Multi-variable analysis adjusted for age, race, gender and presence of neutropenia (<500/mcl).
"Other immunocompromised conditions included: rheumatological or hyperinflammatory conditions on immunosuppressive therapy

Table 2: Risk Factors associated with mortality



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270. T2MR: A New Tool for Anti-Fungal Stewardship

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Background. Candidemia is associated with mortality rates between 30 and 50%. T2 magnetic resonance assay (T2MR) is a costly, rapid diagnostic technology that can detect the five most common Candida species in blood with a sensitivity of 91% and specificity of 99.4%. The clinical role of this tool remains unclear but this study shares our clinical experience with T2MR.

Methods. We conducted a retrospective chart review of patients with T2MR testing performed from April 25, 2017 through April 25, 2018. T2MR ordering was restricted to Infectious Diseases pharmacists and physicians without specific ordering criteria. Variables cataloged included the time between order and result in the medical chart, T2MR result, anti-fungal therapy and duration. Descriptive statistics were reported on collected variables.

Results. Sixty-eight unique patients had T2MR ordered at least once during the study time period. The median age was 62.5 years (interquartile range (IQR), 22–92) and 42 patients (62%) were male. The median time between order and result appearing in the medical chart was 6.21 hours (IQR, 3.55–40.93). Out of 72 tests performed, 4 were positive (2 for *C. parapsilosis* and 2 for *C. krusei/glabrata*). Only 1 of 4 T2MR positive patients had concurrent candidemia while 1 patient had suspected fungal endophthalmitis, 1 patient was managed for a fistula, and 1 patient had cutaneous candidiasis.