

Conclusion. At present, we do not use the EORTC/MSG criteria due to lack of tests in our country, in this study the probable group referred usually from community centers had worse outcome and clinical characteristics, that is why we cannot underestimate this group of patients. We need to have better diagnostic tests in order to identify promptly these patients and avoid a late disease presentation.

Disclosures. All authors: No reported disclosures.

183. Do Liver Transplant Recipients Have a Higher Risk for Cryptococcosis Than Non-liver Transplant Recipients?

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Background. Patients with liver cirrhosis have an increased risk for cryptococcosis. However, it is unknown whether they remain at a higher risk for cryptococcosis after liver transplantation.

Methods. Patients undergoing solid organ transplantation at a tertiary hospital in Taiwan were included for analysis. Cryptococcosis was defined based on criteria proposed by the European Organization for Research and Treatment in Cancer and the Mycoses Study Group. Only Nystatin oral suspension but no systemic anti-fungal agents was prescribed routinely post-transplant.

Results. From 2001 to 2016, in total, 1576 patients underwent solid organ transplantation, including 756 kidney, 411 liver, 336 heart, 61 lung, and 12 multi-organ transplantation. Cryptococcosis developed in 20 patients (1.3%), including cryptococcosis in 9, pulmonary/urine in 6, meningitis in 3, and surgical site infection in 2. Its incidence was 3.2% (13/411) in liver, 1.5% (5/336) in heart, and 0.3% (2/756) in kidney transplant recipients. Compared with 1165 non-liver transplant recipients, 441 liver transplant recipients had a significant higher incidence of cryptococcosis (3.1% vs. 0.6%, $P < 0.01$) and developed the disease with a shorter median duration after transplantation (75 vs. 213 days). Cryptococcosis with very-early onset (<30 days after transplantation) developed in 38.5% (5/13) of liver transplant recipients with cryptococcosis, but only 14.3% (1/7) in non-liver transplant recipients. Six patients (30%) died after a median follow-up duration of 399 days, and only two deaths were related to cryptococcosis.

Conclusion. Our findings showed that liver transplant recipients still had a higher risk for cryptococcosis, and the disease developed earlier after transplantation than non-liver transplant recipients.

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184. Review of Treatment Regimens for Mucormycosis in a Las Vegas County Hospital Between 2013 and 2017

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Background. Mucormycosis (MC) is a group of invasive fungal infections with a mortality rate approaching 100% in disseminated disease. The incidence of MC is low, with one study estimating 500 cases/year in the United States, making optimal treatment difficult to identify. Liposomal amphotericin B (L-ampho), along with aggressive surgical intervention, is the first-line treatment for MC. Isavuconazole (ISA) and posaconazole (POSA) are newer azoles used as salvage therapy in patients not improving with L-ampho. Limited data are available about the use of L-ampho in combination with ISA or POSA as an initial treatment regimen, but aggressive treatment empirically may increase favorable outcomes.

Methods. We performed a retrospective review of patients diagnosed with MC from 2013 to 2017 at University Medical Center of Southern Nevada in Las Vegas, Nevada. Data collected included patient demographics, comorbidities, and predisposing risk factors as well as treatment regimens. Patients were evaluated for outcome after treatment therapy with monotherapy (L-ampho, POSA or ISA) or combination therapy (L-ampho with ISA).

Results. From 2013 to 2017, seven cases of MC were identified – five rhinocerebral (RC), one cutaneous (CT), and one pulmonary (PM). The most common risk factor was uncontrolled diabetes (5/7), followed by HIV (2/7) and non-Hodgkin lymphoma (1/7). Fifty-seven percent of patients received monotherapy and 43% received combination therapy (L-ampho/ISA). All the patients receiving combination therapy had RC. Seventy-one percent of patients survived to discharge regardless of treatment regimen. One hundred percent of combination therapy patients survived to discharge, whereas 50% of monotherapy patients survived to discharge. The two mortalities were patients with PM and CT MC.

Conclusion. MC is a rare infection with high mortality. For this reason, we are using ISA in combination with L-ampho as initial treatment to improve clinical outcomes. With our limited experience, combination therapy showed better rates of survival to discharge, without increasing adverse events. Our data suggest the use of combination therapy may improve outcomes in MC, but a larger sample of patients

treated with initial combination therapy is required to strengthen conclusions about patient outcomes.

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185. The Trends in the Distribution of *Candida* species Causing Candidemia at a Community Hospital in 2005 and 2014

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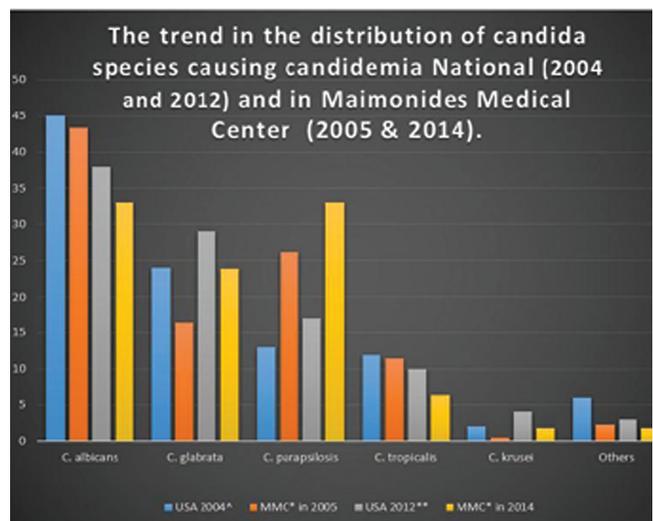
Background. *Candida* remains the most common cause of invasive fungal infections, with an attributable mortality of 15–35%. Although five *Candida* species (*C. albicans*, *C. tropicalis*, *C. parapsilosis*, *C. glabrata*, and *C. krusei*) account for 92% of cases of candidemia, *Candida albicans* remains the most common cause of candidemia. However, recent studies report that the frequency of non *albicans* species are increasing globally and the distribution of *Candida* spp. varies significantly among different geographic regions and hospital units.

Objective. We determine the distribution of *Candida* species causing candidemia at an adult level 1 Trauma Center in Brooklyn, New York and compared the trends of *Candida* species between 2005 and 2014. The results were compared with trends of US data collected in 2004 and 2012. Knowledge of the frequency of causative species would facilitate appropriate selection of empiric antifungal therapy.

Methods. We performed a retrospective chart review of patients with candidemia who were admitted in 2005 and 2014. We determined the frequency of *Candida* species and compared 2005 data with those in 2014.

Results. In total, 226 and 109 patients with candidemia were admitted to our hospital in 2005 and 2014, respectively. Although, *C. albicans* was the most common species (43% of candidemia in 2005), its frequency decreased to 33% in 2014. The frequencies of *C. glabrata* and *C. parapsilosis* increased in 2014 compared with those in 2005 (24% vs. 16% and 33% vs. 26%, respectively). Figure 1 compared the proportion of *Candida* species in Maimonides Medical Center to National data.

Figure 1



^A Hajjeh, Sofair, Harrison, et al. 2014

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^{**} Asmundsdottir, Erlendsson & Gottfredsson (2013).

Conclusion. Our finding of an increase in non-*albicans* spp. causing candidemia is consistent with published reports. We saw more cases of *C. parapsilosis* compared with published data. Our results may be used to inform empiric antifungal therapy.

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186. Epidemiology of Invasive Fungal Disease by *Aspergillus* in a University Hospital in Santiago – Chile, During the Period 2005–2015

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Background. In Chile, there is little information on invasive fungal disease (IFD) due to filamentous fungi. A study of our institution showed 41 episodes in hemato oncological patients between the years 2004 and 2008, being the main cause *Aspergillus*, but the epidemiological characteristics of this infection in Chilean patients are not currently known. The objective describes the epidemiology of IFD by *Aspergillus* in our center.

Methods. Retrospective study in adults patients hospitalized in our center, diagnosed with IFD by *Aspergillus* between 2005 and 2015. Medical records of identified cases were reviewed, incidence were calculated with the discharges numbers and total numbers of IFD. The study was approved by the Institutional Ethics Committee.

Results. Sixty-seven cases were identified, with an incidence of 2.53 per 10,000 discharges between 2005 and 2015, with 35 cases of IFD in the period 2005–2010 and 32 cases in the period 2011–2015. The etiologies were *A. fumigatus* 42%, *A. flavus* 7%, *A. terreus* 7%, *A. niger* 3%, and *Aspergillus* spp. 40%. According EORTC/MSG criteria, 39% were proven, 52% probable, and 9% possible. The 55% of patients were male, the mean \pm SD age was 51 ± 18 years, 57% had hematological conditions, mainly acute leukemias, rheumatological conditions in 15% and solid organ transplant in 13%, neutropenia under $500/\text{mm}^3$ in 37% and serum galactomannan test >0.5 in 67%. The clinical focus was 73% pulmonary and 17% rhinosinus. The treatment was 81% monotherapy, 73% with voriconazole, 15% with liposomal amphotericin B and 6% with caspofungin. The 30 days mortality was 39%.

Conclusion. The epidemiology of IFD by *Aspergillus* is similar to that described in developed countries, in highly vulnerable patients with a mortality close to 40%. More epidemiological information from other hospitals is necessary to complete the epidemiology of *Aspergillus* infections in our country.

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187. Candidemia with Ocular Manifestations: A Review of 26 Cases in a University Hospital in Japan

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Background. Ocular candidiasis is a major complication of candidemia; however, many remains unknown for the incidence, risk factors, and outcome of eye involvement.

Methods. We retrospectively reviewed the medical records and obtained information related to fungal infection and its management, and visual outcome at Fukuoka University Hospital from 2000 to 2016.

Results. Of 143 patients with candidemia for whom an ophthalmology consult was requested, 26 had findings consistent with the diagnosis of ocular candidiasis. Patients with ocular candidiasis were mostly infected with *Candida albicans* ($n = 20$), followed by *C. glabrata* ($n = 4$), and *C. tropicalis* ($n = 2$). In contrast, only one patient infected with *C. parapsilosis* had ocular involvement although the number of the patients with *C. parapsilosis* candidemia was second the most among candidemia. No difference was seen for the β -D-glucan in patients with or without ocular candidiasis (128.6 vs. 106.1, $P = 0.654$). All of the isolates other than *C. glabrata* were susceptible to fluconazole. In all of 23 patients with existing central venous catheters, CVCs were removed after the diagnosis of candidemia. Four-week mortality rate in patients with ocular candidiasis was 16.7% (three of 18 patients) which was not significantly different from that in patients without ocular manifestations. All treated patients were confirmed for clearance of candidemia, received systemic antifungals, and improved for visual outcome or remained stable, and no patients complicated visual loss without surgical treatment. Therapy with micafungin or caspofungin followed by fluconazole (12 patients) was successful in all patients.

Conclusion. Ocular involvement occurred in 18% of patients with candidemia, and treatment with echinocandins followed by fluconazole was successful in most cases with follow-up.

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188. Epidemiology, Risk Factors and Outcomes of Candida Empyema: A 5-Year Single-Centered Experience

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Background. Candida empyema is a rare manifestation of invasive candidiasis and can occur as a result of candidemia or direct inoculation of the pleural space after thoracic or abdominal surgeries. The risk factors and outcomes of candida empyema are poorly defined.

Methods. We performed a retrospective descriptive analysis of all patients that had Candida species isolated from pleural fluid, from May 2012 to April 2017 at our institution.

Results. Sixty patients with Candida empyema were identified. Patient characteristics are shown in Table 1. The majority of patients 68% had contiguous surgery and 25% had recent solid organ transplantation most of these were lung/heart transplants. The majority isolates were non-*Candida albicans* species (52%). Fifty-two patients (86.7%) received antifungals treatment for empyema: 72% received an azole and 13% received an echinocandin. Fluconazole was the most frequent antifungal (63.3%). Mean duration of treatment was 4 weeks. Of these patients 78% underwent chest tube drainage (40% before diagnosis, 39% after diagnosis) and 22% required VATS/decortication. The overall 30-day mortality was 30%. Candidemia was noted in seven patients (11.7%). Thirty-day mortality was associated with sepsis OR 1.04–11.4, $P = 0.049$, history of diabetes $P = 0.045$ and sepsis at the time of candida isolation. A history of solid organ transplantation had a negative effect on mortality OR 0.01–1.07.

Conclusion. Candida empyema was associated with recent contiguous surgery in the majority of cases including lung/heart transplants. Candida empyema is associated with significant mortality despite antifungal treatment and drainage as was associated with sepsis syndrome and diabetes.

Variable	N = 60	<i>Candida albicans</i> 29 (48.3%)	Non- <i>Candida albicans</i> 31 (51.7)	P-value
Gender: male	40 (66.7)	20(69)	20(64.5)	0.78
Malignancy	16 (26.7)	7 (24.1)	9 (29)	0.77
Procedure within 1 year	41 (68.3)	20 (69)	21(67.7)	0.99
Transplant	15(25)	6 (20.7)	9 (29)	0.56
Sepsis at time of infection	31(51.7)	14(48.3)	17(54.8)	0.79
Candidemia	7 (11.7)	2(6.9)	5(16.1)	0.42
30-day mortality	18(30)	10(34.5)	8(25.8)	0.57
Antifungal treatment	52(86.7)	24(82.8)	28(90.3)	0.46
Duration of treatment, weeks	4(2.5–6)	3.88(2.4)	6.55(6.7)	0.009
	53 patients treated			

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189. Epidemiology and Outcomes of Hospitalizations with Invasive Aspergillosis in the United States, 2010–2013

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Background. Invasive aspergillosis (IA) complicates the care of up to 13% of patients with varying forms of immune compromise. The accompanying morbidity and mortality associated with IA remains high. We sought to describe the epidemiology and outcomes for all hospitalizations associated with IA in the United States.

Methods. We analyzed the National Inpatient Sample (NIS) from the Agency for Healthcare Research and Quality (AHRQ) for 2010–2013. We identified subjects with high-risk conditions for IA (stem cell or solid organ transplant, critical illness, major surgery, mild-to-moderate immune compromise, severe immune compromise, and other [human immunodeficiency virus, pneumonia, chronic obstructive pulmonary disease]). IA was identified via ICD-9-CM codes 117.3, 117.9, and 484.6. We compared characteristics and outcomes between those with (IA) and without IA (non-IA). We calculated the IA-associated excess mortality, length of stay (LOS) and costs using propensity-score (PS) matching.

Results. Of the 66,634,683 discharges who met the study inclusion criteria, 154,888 (0.2%) had a diagnosis of IA. Patients with IA were more likely to be male (50.9% IA vs. 46.7% non-IA, $P < 0.001$), and African American (15.3% IA vs. 12.5% non-IA, $P < 0.001$). The most common high-risk condition among those not classified as IA was major surgery (50.1%). In the IA group critical illness was noted most frequently (41.0%). The burden of both chronic (median [interquartile range, IQR] number of Elixhauser comorbidities 3 [1, 5] non-IA vs. 4 [3, 6] IA, $P < 0.001$) and acute (median [IQR] number of procedures during the hospitalization 2 [1, 3] non-IA vs. 3 [1, 6] IA, $P < 0.001$) illnesses was higher in the IA group than the non-IA. After PS-matching, mortality in IA (14.1%) was 37% higher than in non-IA (10.3%, $P < 0.001$), translating to an odds ratio = 1.43; 95% CI (1.36, 1.51). IA was associated with 6.0 (95% CI 5.7, 6.4) excess days in the hospital and excess \$15,542 (95% CI \$13,869, \$17,215) in costs/hospitalization.

Conclusion. Although rare even among high-risk groups, IA is associated with high hospital mortality, excess duration of hospitalization, and costs. Given nearly 40,000 annual IA admissions in the United States, we estimate that the aggregate IA-attributable excess costs may reach \$600 million annually.

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