Results. A total of 61 patients with proven mucormycosis were analyzed. The primary site of infection was as follows; lung (n = 38, 62.3%), rhino-sinus (n = 21, 34.4%), and orbito-cerebral (n = 15, 24.6%). Based on sterile culture results, 4 patients (6.6%) had the evidence of co-infection with other fungi including *Candida* species (from 3 cases; *C. albicans* from 1, *C. glabrata* from 1 and *C. krusei* from 1), *A. flavus* (1), and *F. solani* (1), and 23 patients (37.7%) had the evidence of co-infection with bacteria including *E. faecium* (VRE) (8), *P. aeruginosa* (5),coagulase-negative staphylococci (5), methicillin-susceptible *S. aureus* (4) and others. Based on non-sterile culture results, 10 patients (16.4%) had the evidence of co-infection with fungi other than mucormycosis including *Aspergillus* species (5, *A. fumigatus* from 1, *Aspergillus* not *fumigatus* from 1 and *A. oryzae* from 1), *Candida* species (5, *C. albicans* from 2, *C. tropicalis* from 2 and *C. glabrata* from 1), *Penicillium* species (1), *S. cerevisiae* (1) and *P. jirovecii* (1), and 24 patients (39.3%) had evidence of bacterial co-infection including *S. maltophilia* (5), methicillin-resistant *S. aureus* (5), *E. faecium* (VSE) (3), *K. pneumonia* (3), *P. aeruginosa* (3), and others.

Conclusion. Bacterial or fungal co-infections appear to frequently occur as appreciated before in patients with mucormycosis. These data provide us important information to select empirical antifungal and antibacterial agents.

Table 1. Clinical Characteristics and Culture Positivity in Proven Mucormycosis Patients

Variable		Total (n = 61)
Age, mean years ± SD		59.2 ± 12.9
Male sex		33 (54.1)
Positive galactomannan assay	Serum	22/28 (78.6)
	Bronchoalveolar lavage fluid	10/16 (62.5)
	Both	4/16 (25.0)
Underlying conditions	DM	17 (27.9)
	Solid organ transplantation	11 (18.0)
	Hematopoietic stem cell transplantation	10 (16.4)
	Hematologic malignancy	7 (11.5)
	Solid cancer	8 (13.1)
	Liver cirrhosis	28 (45.9)
	Neutropenia	8 (13.1)
	Chronic kidney diseases	11 (18.0)
	ESRD on dialysis	0 (0)
	Autoimmune diseases with immunosuppressive agents	3 (4.9)
Infected organs	Pulmonary	38 (62.3)
	Rhino-sinus	21 (34.4)
	Orbito-cerebral	15 (24.6)
	Gastrointestinal	8 (13.1)
	Skin	2 (3.3)
	Etc. (bone, thyroid, tongue, etc.)	5 (8.2)
Positive culture results for mucormycosis	Sterile sites[a]	12 (19.7)
	Rhizopous species	7
	Mucor species	3
	Absidia species	1
	Cunninghamella species	1
	Non-sterile sites[b]	4 (6.6)
	Rhizopous species	2
	Mucor species	1
	Cunninghamella species	1
Patients with other pathogens confirmed from sterile sites[a]	Fungi other than mucormycosis	4 (6.6)
	Bacteria and others	23 (37.7)
Patients with other pathogens confirmed from non-sterile sites[b]	Fungi other than mucormycosis	10 (16.4)
	Bacteria and others	24 (39.3)

Data are given as mean ± SD or as number (percentage).
[a]Including blood (plasma, serum), CSF, specimen obtained by a sterile procedure and pleural fluid
[b]Including sputum, bronchoalveolar lavage fluid, cranial sinus cavity specimen, urine and other specimen (pus culture, ascites, etc.)

Table 2. Co-infecting Organisms Isolated from Sterile and Non-sterile Specimen in Proven Mucormycosis Patient

Pathogen	Sterile culture[a]	Non-sterile culture[b]	Total (n = 61)
Fungi other than mucormycosis			
Aspergillus species			
Aspergillus flavus	1	0	1 (1.6)
Aspergillus fumigatus	0	3	3 (4.9)
Aspergillus not *fumigatus*	0	1	1 (1.6)
Aspergillus oryzae	0	1	1 (1.6)
Fusarium solani	1	0	1 (1.6)
Penicillium species	0	1	1 (1.6)
Candida species			
Candida albicans	1	2	3 (4.9)
Candida tropicalis	0	2	2 (3.3)
Candida glabrata	1	1	2 (3.3)
Candida krusei	1	0	1 (1.6)
Saccharomyces cerevisiae	0	1	1 (1.6)
Pneumocystis jirovecii	0	1	1 (1.6)
Bacteria			
Viridans streptococci	1	0	1 (1.6)
Coagulase-negative staphylococci	5	2	7 (11.5)
Methicillin-susceptible *Staphylococcus aureus*	4	0	4 (6.6)
Methicillin-resistant *Staphylococcus aureus*	1	5	6 (9.8)
Corynebacterium Striatum	1	0	1 (1.6)
Enterococcus faecalis	0	1	1 (1.6)
Enterococcus faecium (VSE)	0	3	3 (1.6)
Enterococcus faecium (VRE)	8	2	10 (16.4)
Corynebacterium Striatum	0	1	1 (1.6)
Escherichia coli	0	1	1 (1.6)
Klebsiella pneumoniae	0	3	3 (4.9)
Klebsiella pneumoniae (CRE)	1	2	3 (4.9)
Klebsiella aerogenes	1	1	1 (1.6)
Enterobacter cloacae	1	0	1 (1.6)
Pseudomonas aeruginosa	5	3	8 (13.1)
Acinetobacter baumannii	0	2	2 (3.3)
Acinetobacter lwoffii	0	1	1 (1.6)
Serratia marvescens	1	1	2 (3.3)
Stenotrophomonas maltophilia	2	5	7 (11.5)
Lactobacillus species	0	1	1 (1.6)
Others	0	2	2 (3.3)

Data are given as number (percentage).
[a]Including blood (plasma, serum), CSF, specimen obtained by a sterile procedure and pleural fluid
[b]Including sputum, bronchoalveolar lavage fluid, cranial sinus cavity specimen, urine and other specimen (pus culture, ascites, etc.)

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1704. *Geotrichum* spp. Invasive Infection: Experience From a Third-Level Referral Center in Mexico

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Background. *Geotrichum spp* has been recognized as an emergent pathogen that causes invasive infection in immunosuppressed hosts. There is no data in Latin America about invasive *Geotrichum* spp. infections. Our objective was to describe the epidemiology, clinical characteristics, and outcomes of patients with this infection.

Methods. We conducted a retrospective survey from 2001 to 2018, of all the *Geotrichum* spp. isolated from clinical samples at our institution. Data on demographic, clinical, laboratory findings, and imaging studies were obtained from medical records. All cases classified as proven or probable invasive fungal infections (IFI) according to the EORTC/MSG criteria were included. Isolates with unavailable clinical information were excluded. Descriptive analysis was made.

Results. We found 18 patients with a proven/probable *Geotrichum* spp. IFI. The mean age was 48.5 years and 55.5% were male. The most common predisposing condition was hematological malignancy (55.5%), autoimmune diseases (22.2%) and HIV, chronic granulomatous disease, and solid-organ malignancy in 1 case, respectively. Fifteen (83.3%) received immunosuppressors (cancer chemotherapy or steroids); 27.7% had neutropenia at the time of diagnosis. The most common clinical syndromes were lower respiratory tract infection and persistent fever (83.3%). Chest abnormalities were present in 15/16 CT scans, pulmonary nodules were the most common finding (62.5%). *Geotrichum* spp. was isolated from bronchoalveolar lavage, 77.7%; blood culture, 22.2%; and peritoneal dyalisis fluid, 5.6%. Seven patients were coinfected with other pathogens: 4 *Aspergillus* spp., 1 *H. parainfluenzae,* 1 *P. aeruginosa,* and 1 *E. coli.* Fifteen patients received antifungal treatment: 7 amphotericin B, 8 voriconazole, and 1 itraconazole. Among survivors (11), 72.7% received antifungal therapy at discharge: 4 voriconazole and 4 itraconazole. Three patients did not receive any antifungal: 1 was diagnosed postmortem and 2 were considered colonization (both were alive at 30 days). Overall mortality was 38.8%.

Conclusion. Eighteen cases of *Geotrichum* spp. were found. The majority had lower respiratory tract infection. Despite antifungal therapy 38.8% died. *Geotrichum* spp. should be recognized as an emerging pathogen in immunosuppressed hosts.

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1705. Clinical Characteristics and Outcomes of Cryptococcosis in a Tertiary Care Center in Kentucky, 2005 to 2017

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Background. Cryptococcosis is an invasive fungal infection that causes pneumonia and extrapulmonary infection. This study explores its presentations, diagnostic tests, and outcome in different groups over a 12-year period at an academic medical center.

Methods. This was a retrospective study of the patients treated at University of Kentucky HealthCare from October 16, 2005 to October 15, 2017. Inclusion criteria were positive cryptococcal antigen (Ag), positive culture, or presence of yeast morphologically consistent with *Cryptococcus* on cyto- or histopathology. Patients were divided into HIV-infected, solid-organ transplant (SOT) recipients, and non-HIV/non-transplant groups. Cryptococcal meningitis comprised of either positive CSF Ag, culture, cytology or histopathology.

Results. A total of 114 patients were identified; 23 HIV-infected, 11 SOT recipients and 80 non-HIV/non-transplant patients (Table 1). *Cryptococcus neoformans* was the most common yeast isolated (91.8%). Cryptococcal meningitis was seen in 56% of total patients whereas 27% had isolated cryptococcal pneumonia ($P < 0.01$). Blood cultures and serum Ag were positive in 34% and 70%, respectively. Only 8.7% of HIV-infected patients had isolated pulmonary cryptococcosis compared with 36.4% in SOT recipients ($P < 0.01$). In patients with cryptococcal meningitis, abnormal CSF cell count, protein, or glucose was noted in 85.3%; India ink was positive in 61.3% and CSF culture was positive in 73.4% (Table 2, Figure 1). CSF cryptococcal Ag was detected in 95.6% cases if CSF cultures were positive, whereas serum Ag was positive in only 85.1% of meningitis cases. Mortality was seen in 48.6% (17/35) of patients with cirrhosis/liver disease, compared with 21.5% (17/79) of non-cirrhosis/liver disease ($P = 0.003$). Transplant group had 54.5% mortality compared with 26.1% in HIV group ($P = 0.016$).

Conclusion. Cryptococcal meningitis was the most common presentation for cryptococcal disease in all three groups. Isolated pulmonary disease was least common in the HIV-infected group. Inpatient mortality rate was higher in patients with cirrhosis/liver disease and transplant group compared with those without cirrhosis/liver disease and HIV group, respectively. It is imperative to rule out meningitis in immunosuppressed patients with cryptococcal pneumonia.