1709. Epidemiology of Invasive Fungal Infection (IFI) after Severe Influenza
Requiring Intensive Care Unit (ICU) Admission: 10-Year Experience at a Tertiary Care Center in the United States
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Background. Despite increasing recognition of aspergillosis complicating severe influenza and its associated high fatality in Europe, incidence and features of the disease in the United States are unknown.
Methods. We reviewed all influenza cases requiring ICU admission from 2009 to 2019 at our center.
Results. 262 patients with influenza required ICU admission. 4% (10) developed IFI at median 2d after influenza diagnosis. 80% (8/10) of patients with IFI were infected with influenza A vs. 88% (221/252) without IFI. 20% were on steroids at the time of IFI diagnosis. 70% of IFI required mechanical ventilation. Type of IFI were pneumonia (70%), Aspergillus and invasive fungal infection. 20% each with Aspergillus and Candidiasis, and Coccidioides fungemia (10%). 4% (10%) of patients were fungal colonized, but did not have IFI (5 A. fumigatus, 1 A. terreus, 4 Penicillium). CT findings of IFI included nodules (4), cavitation (3), and ground-glass opacities (2). Serum galactomannan (GM) was positive in 3 (43%). Median time to antifungal therapy (AF) was 2 days. Triazoles were prescribed to all 7 patients with aspergillosis. Posaconazole and amphotericin B were AF for patients with W angiella/LaCiehtemia, respectively. Patients with C. immitis fungemia died before AF. Median duration of AF was 60 days among survivors. Patients with IFI required acute hemodialysis more frequently than colonized patients (60% vs. 0%; P = 0.01). 30-day mortality was 60% (6/10) and 20% (92/10) in patients with IFI and colonization, respectively (P = 0.2). Patients with IFI had significantly higher in-hospital and 60-day mortality than those without IFI (Fig 1, P = 0.009).
Conclusion. Our rate of post-influenza IFI (4%) was lower than reported in Europe (~15%), which might stem from a lack of systematic BAL GM testing at our center, over-reliance on GM to make diagnoses in Europe, and/or differences in patient populations and clinical practices in treating severe influenza. IFI and fungal colonization rates were similar at our center, highlighting the importance of using well-defined criteria to define disease. Given the high mortality of post-influenza IFI, priority should be given to defining risk factors that might identify patients for targeted AF prophylaxis. In using AF, it is important to recognize that Aspergillus is not the only cause of IFI.
Fig 1. Mortality of patients with severe influenza admitted to ICU

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1710. Profiling Patients with Rare Mucormycosis Infections Using Real-world Data
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Background. Invasive mucormycosis (IM) is universally fatal if untreated and is a challenge to assess due to its rarity. Diagnosis is difficult and can be missed due to a low index for suspicion. IM prevalence may be increasing with medical advances, especially in neutropenia management, leading to improved survival and expansion of the at-risk patient population. Large administrative databases contain patient-level chart information and may offer a way to describe IM patients in a representative sample of the population.
Methods. A retrospective observational study was conducted using US data from the deidentified Optum Electronic Health Record database between January 2007 and June 2018. Patients with any fungal infection and IM specifically were defined by ICD9 (110-119, 117.7) or ICD10 (B15-49, B46) codes. Descriptive statistics were used to assess demographics, comorbidities, and antifungal agents (AF) prescribed among IM patients with an underlying diagnosis of hematologic malignancy (HM). Restricting to an at-risk, population minimized possible false IM coding in the sample.
Results. Of the approximately 97 million patients in the database, about 5 million had a fungal infection diagnosis and 5,208 had an IM diagnosis (0.005% overall, 0.11% of fungal infection). Among those with underlying HM (n = 698,187), 641 IM cases were observed (0.09%); of whom, 46% were male, 82% were over 40 years of age, and 77% were in the Midwest region of the United States. They were 83% Caucasian, 7% African American, 2% Asian, and 8% other/unknown race or ethnicity. The mean Charlson Comorbidity Index score was 3 ± 2 and the top comorbidities, aside from malignancy, were diabetes (24%, n = 151), chronic pulmonary disease (22%, n = 141), and renal disease (11%, n = 69). Not all IM patients were treated. There were 376 AF prescriptions, of which 35% were for fluconazole, 28% for posaconazole, and 14% for voriconazole, followed by 7% each for itraconazole and amphotericin formulations.
Conclusion. A sizable number of IM patients were identified from a large US electronic medical records database. More work is needed to understand the data. Given the significant challenges in prospectively identifying IM patients, a large database may allow for a broader insight into patients at risk and potential predictors of IM.
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