Objective: To present the current spectrum of cryptococcosis in Brazil and report measures taken to face the epidemiological threat of mucormycosis over 12 years.

Methods: Authors developed by the Laboratory of Mycology of the Universidade Federal do Rio Grande (LabMyco/FGUR) and their results are described. Database from the LabMyco/FGUR was consulted and all cases of proven and probable mucormycosis (required fungal isolation in culture) from humans and animals (cats and dogs) diagnosed between January 2010 and March 2022 were included.

Results: During the 12 years of the study, four educational events to discuss the regional emergence of mucormycosis were promoted (in the years 2013, 2015, 2017, and 2018). Before these meetings, health professionals were intervened, and approximately half were unfamiliar with the regional hyperendemicity, epidemiological agent, source of infection, and the main clinical presentation of cryptococcosis. With these events, a total of 144 health professionals were instructed to diagnose and treat the disease. Additionally, in 2017, along with the municipal health system, we implemented a public specialized referee service (SBRP) in the University Hospital (HUF) to provide a first service to patients with mucormycosis.

The diagnosis of mucormycosis was confirmed in 47 patients referred to HUF-FURG/EBERBR. All were clinically evaluated by periodic follow-up until clinical care and received appropriate antifungal treatment by the Brazilian System of Health. A positive impact of the SBRP was demonstrated by the decrease of 23.5% in the interval between the beginning of the lesions and diagnosis (before SBRP, mean of 206 days versus after SBRP implementation, 79.5 days). Since the start of the mucormycosis diagnosis by SBRP/FGUR, each year (2010 to 2022), 84 cases of proven mucormycosis were diagnosed by fungal cultures; 721 in cats, 153 in humans, and 58 in dogs.

In a region with 500,000 inhabitants, 0% cases of mucormycosis were diagnosed in the last 12 years. Since 2020, all cases are from a single laboratory service, we believe this number is underestimated, and the threat is even greater. Although some improvements regarding the diagnosis and treatment of this mycosis in our region could be achieved by the educational strategy, the implementation of the SBRP follows an intersectoral approach to several challenges that urgently need attention. Our region has the second most important port of the country, thus, more efforts, with public health policies directed to the treatment of cats with mucormycosis, are urgently needed to control the spread and fungal dissemination not only to local and regional populations, but also to other countries. 

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Invasive Pulmonary Aspergillosis (IPA) Among Non-Intubated COVID-19 Patients—a New Age Fungal Storm

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Introduction: COVID-19 patients are at higher risk for the development of secondary infections, especially fungal due to multiple risk factors associated with COVID diseases and its management. COVID-associated pulmonary aspergillosis (CAPA) is a new clinical entity that is contributing to high mortality and morbidity among immunocompetent COVID-19 patients. Lack of adequate published literature, absence of typical host factors, and lack of specific diagnostic criteria and management algorithms add to the difficulty in early diagnosis and treatment initiation. The scant available data is on CAPA among intubated patients, however, there are no data on CAPA in non-intubated COVID-19 patients.

Methods: This observational study included 24 non-intubated CAPA patients and 72 controls (1:3 randomly selected age and sex matched) at our hospital between April-June 2021. CAPA cases were defined as per modified-AspICU criteria. Demographic characteristics, risk factors, treatment, factors contributing to morbidity, and outcomes were evaluated. Descriptive statistics were reported as mean ± SD, median, number, and percentage. The proportion of CAPA was reported as frequencies and percentages. Clinical characteristics were compared between CAPA and control using Chi-squared, independent t-test and Mann-Whitney U test as appropriate. Association of CAPA with mortality was performed using Pohar’s exact test. Logistic regression was performed to assess the factors associated with CAPA. P-value <0.05 was considered statistically significant. All analyses were performed using SPSS 25.0.

Results: A total of 6018 COVID patients were admitted during the study period. Respiratory samples of 26 patients yielded Aspergillus species. Two patients were excluded as colonizers based on modified AspICU criteria. In all, 24 CAPA cases 72 controls were studied for all the variables. CAPA occurrence was 0.59% among non-intubated COVID-19 patients (24/4058).

Both the groups had a male preponderance (75% CAPA, 90% control), the median age was 52.8 ± 14.3. Demographic data and risk factors were comparable. There were no significant differences in lab parameters between the groups. Association of COVID severity and development of CAPA was not statistically significant (OR 2.05, 95% CI, P-value 0.36; OR 6.45, 95% CI, P-value 0.08). Significant associations between the cases and controls included, treatment with a higher dose and longer duration of steroids with development of CAPA (OR 1.09, 95% CI, P-value 0.022; OR 1.09, 95% CI, P-value 0.062). Longer hospital stay (median of 18.4 ±10.4 days [P-value 0.001]). All-cause mortality was 16.7% in CAPA group (P-value <0.001).

Between CAPA non-survivors and survivors, serum galactomannan levels (P-value 0.03), duration of hospital stay (P-value 0.042), dose and duration of systemic corticosteroid (P-value 0.031), and duration of oxygen requirement (P-value 0.05) were found to be statistically significant.

Conclusion: CAPA in an emerging complication with high morbidity and mortality among immunocompetent COVID-19 patients that requires a high index of clinical suspicion. A standard diagnostic criteria and management protocol for early identification and treatment initiation is the need of the hour. Role of steroids in the development of CAPA and the role of galactomannan in diagnosis and prognosis of CAPA needs to be further investigated.