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An uncommon case of subcutaneous basidiobolomycosis in a young adult — a case report

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Basidiobolomycosis is an uncommon fungal infection of the subcutaneous tissue of the lower limbs caused by *Babsidiobolus ranarum*. It presents as chronic granulomatous inflammation of the skin and subcutaneous tissues affecting the immunocompetent young adults.

We report a 23-year-old male who presented with soft tissue swelling of the left lower limb for the past 4 months. He had consulted a private hospital previously where he underwent incision and drainage and was prescribed multiple antibiotics. As there was no resolution of the symptoms, he presented to us with swelling of the thigh and 1 × 1 cm size non-healing ulcer over the posterolateral aspect at the site of incision with inflammation of the surrounding tissues. On examination, the surrounding tissues also showed induration and warmth. The routine blood investigations were normal and serology for HIV was also negative. The pus aspirate was cultured in Saborauds's Dextrose agar and incubated at 25°C showed growth of creamy, glabrous, heaped up, radially furrowed colonies after 4 days. On microscopic examination with lactophenol cotton blue preparation broad, aseptate hyphae with numerous thick-walled beaked zygospores were observed as characteristic of *B. ranarum*. Based on the culture results diagnosis of basidiobolomycosis was made and the patient was started on oral itraconazole. There was a marked reduction in the size of swelling and healing of the ulcer following 10 weeks of oral itraconazole therapy.

This report highlights the need for awareness of this disease for the correct diagnosis of this disfiguring condition which is treatable.

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The effect of COVID-19 and immunosuppressive drugs and diabetes on the spread of mucomycosis

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Mucormycosis is a serious but rare opportunistic fungal infection that spreads rapidly, so prompt diagnosis and treatment are essential to prevent high mortality rates and complications. Mucormycosis is caused by the inhalation of filamentous fungi, especially in patients with suppressed immune systems. Mucormycosis affected human populations after COVID-19. According to searches, invasive mucormycosis to COVID-19 has been widely reported from survivors, mild to severe. Of course, it seems that the underlying diseases and most importantly uncontrolled diabetes or immunosuppressive diseases have provided the conditions for the development of black fungus. In addition, over-the-counter administration of steroid drugs to control inflammation of the cornea seems to be another cause of the spread of the disease. Groups of patients were analyzed for the link between the COVID-19 epidemic and the nightmare of mucormycosis. Black fungus usually causes necrosis of the head and neck, including the nose, paranasal sinuses, and facial bones, which can sometimes cause complications. Therefore, the present study emphasizes mucormycosis and its associated conditions, its mechanism in normal individuals with COVID-19, the effective factors and challenges to overcome this black mold infection.

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Investigating the link between pleomorphism and virulence in *Cryptococcus*

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Objectives: Fungal pathogens *Cryptococcus neoformans* and *C. gattii* are responsible for hundreds of thousands of annual deaths in immunocompromised individuals. Considerable phenotypic variation is exhibited by strains in response to stresses encountered during host infection, including increased capsule and cell size, the release of shed capsule, and the production of giant (>15 μm), micro (<1 μm), and irregular cells. We aimed to investigate whether the production of these morphological variants is associated with virulence using two sets of strains. The first is a collection of diverse clinical isolates obtained from HIV/AIDS patients in Botswana with accompanying clinical data. The second is a collection of lineages derived from the *C. neoformans* type strain H99 with high genetic similarity but differing levels of virulence. Some lineages in this set possess a mutation in SGF29, which encodes a component of the SAGA histone acetylation complex that has previously been implicated in their hypervirulence.

Methods: Isolates were cultured under conditions that simulate stresses encountered in vivo (DMEM, 5% CO_2, 37°C) as these are known to enhance capsule production and induce cell size changes. Cells were counterstained with India Ink, visualized by light microscopy, and phenotypes were scored. For clinical isolates, MLST analysis was performed to determine their relatedness. For H99 strains, Galleria mellonella larval infection assays, growth curves, and antifungal susceptibility testing was performed to confirm their relative virulence and growth profiles. Serial block face and regular scanning electron microscopy were used to investigate the internal morphology of the giant, micro, and irregular cells to confirm that they possess attributes of functional cells.

Results: Substantial pleomorphism was seen across both collections. In the clinical strain set, phenotypic variables fell into two groups associated with differing symptoms. The production of 'large' phenotypes was associated with a higher CD4 count and was negatively correlated with intracranial pressure indicators, suggesting that these are induced in early-stage infection. 'Small' phenotypes were associated with lower CD4 counts, negatively correlated with meningeal inflammation indicators, and positively correlated with intracranial pressure indicators, suggesting that they are produced later during infection and may promote proliferation and dissemination. Isolates possessing giant cells, microcells, and shed capsule were rare, but strikingly, they were associated with patient death.

In the H99 set, strains from hypervirulent lineages had larger average capsule size, greater variation in cell size, and increased production of microcells and shed capsule. Deletion of SGF29 in an intermediate virulence lineage substantially increased its production of microcells and released capsule, consistent with a switch to hypervirulence. SGF29 loss-of-function mutations were subsequently identified in clinical isolates and were found to be significantly correlated with patient death. Expansion of a TA repeat in the second intron of SGF29 in clinical isolates was positively correlated with cell and capsule size, suggesting it also affects SGF29 function.

Conclusion: Our results extend the evidence for a link between pleomorphism and virulence, with a likely role for epigenetic mechanisms mediated by SAGA-induced histone acetylation.

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Candidemia in coronavirus disease 2019 patients in a university hospital in Buenos Aires, Argentina

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It is known that the incidence and epidemiology of candidemia vary according to different geographic regions and/or hosts. Between 1998 and 2019, the incidence in a university hospital in the city of Buenos Aires Argentina, 'HCJSM', was 2.19/1000 discharges. The coronavirus disease 2019 (COVID-19) pandemic altered the previously recognized course of severe infections, including candidemia.

Objective: The aim of this report is to determine the incidence of candidemia in critically ill COVID-19 patients, and the clinical and microbiological aspects of these episodes hospitalized at HCJSM.

Methods: The source documents of this retrospective study are medical records from patients with Sars-Cov-2 and candidemia who were diagnosed between March 1, 2020 and June 30, 2021. At the onset of the pandemic, the HCJSM began admitting patients with COVID-19, and elective procedures were canceled. Demographic, clinical, and laboratory data were reviewed. All data were analyzed using RStudio, a statistical computing platform (version 4.0.2).

Results: During the period under review, 61 episodes of candidemia were identified: 23 episodes (39.7%) in COVID-19 patients, and 38 episodes (60,3%) in no COVID-19 patients. Incidence (x 1000 admission) in no COVID-19 patients was 2.5 (38/14 903): in COVID-19 patients 14.4 (23/1595) and in COVID-19–ICU was 42.3 (20/472). The average age of patients is of 65 years (32-84 range years). The time from admission to ICU to the development of candidemia had a median of 18 days (RIC 9-23). A total of 87.5% of the patients had been on mechanical ventilation and 100% of the patients received broad-spectrum antibiotics and had catheters. Episodes were caused by *C. parapsilosis* (39.7%), *C. albicans* (35%), *C. glabrata* (14%), and other species of *Candida* (11%). A total of 62% of COVID-19 patients who developed episodes of candidemia died during the period under examination. The survival likelihood at 30 days of COVID-19 patients who developed candidemia was higher for *C. parapsilosis* episodes and lower for *C. glabrata* episodes.

Conclusion: The incidence of candidemia showed an increase in COVID-19 hospitalized severe patients. The use of broad-spectrum antibiotics, the presence of catheters, and the use of ventilatory support in COVID-19 patients were the risk factors most associated with the development of candidemia. Although the number of episodes of candidemia is low, without the strength of statistical analysis, it is important to consider that the likelihood of survival of patients with episodes of candidemia varies according to the species recovered.

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Disseminated fusariosis in h ematological malignancies with favo rable outcomes

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Fusarium is a serious fungal disease that mainly affects high-risk hematological patients. Early recognition of cutaneous entry of *Fusarium* in severely immunocompromised patients is critical to initiate early treatment.

The aim of this presentation is to present two cases of disseminated fusariosis in severe oncohematological patients with favorable outcomes.

Case 1: A 65-year-old man was admitted to the hospital for allogeneic hematopoietic cell transplantation. He had chronic myelomonocytic leukemia treated with cytosine analog antineoplastic and received pre-transplant prophylaxis with voriconazole 400 mg/day. On day 8 after transplantation, he presented pain and erythema on the fifth toe. Scarification of the digital intertrigo showed fine septate hyaline filaments. Antifungal treatment with voriconazole 400 mg/day plus liposomal amphotericin B 5 mg/k/d was administered. The patient remained severely neutropenic and the digital lesion progressed to painful necrosis for the following 12 days. BACTEC blood culture developed F. keratoplasticum and MIC (mg/L) amphotericin B 1, voriconazole 8 (CLSI M38-3rd Ed). On day 24 post-transplant, the patient presented an erythematous lesion on the right leg. A toilette of the digital lesion and a skin biopsy of the lesion on the right leg was performed, both of which showed fine hyaline filaments on direct examination with negative culture. On day 55, the patient was stable and amphotericin B was discontinued. He was treated with voriconazole 400 mg/d and had a good clinical evolution. The patient was discharged 65 days after transplantation.

Case 2: An 18-year-old man was admitted to the hospital for chemotherapy treatment for acute lymphocytic leukemia (ALL). The patient received prophylaxis with fluconazole. On day 15 after chemotherapy, he developed *Candida parapsilosis* candidemia; *C.parapsilosis* MIC (mg/L) amphotericin B 1, fluconazole 0.5, voriconazole 0.015; anidulafungin 0.4 (E Def 7.32.EUCAST). The patient was treated with anidulafungin. He remained febrile and neutropenic. On the 19th day, he presented a digital intertrigo on the foot. Direct examination of the scarification of the interdigital lesion showed fine hyaline filaments and the colony was identified as *F. solani* complex, MIC (mg/L) amphotericin B 2, voriconazole 8 (M 38 3rd Ed CLSI). The antifungal treatment was changed to voriconazole 400 mg/d and lipid complex amphotericin B 5 mg/kg/d. On day 22, he was still neutropenic and febrile. Chest and sinus CT scans showed no abnormalities. Blood cultures and BAL culture were negative. The patient developed multiple ecthyma gangrenosum skin lesions on the torso and legs. On day 35, he received a granulocyte transfusion. On days 42 and 44, the serum *GM Aspergillus* was 0.2 and 0.4 respectively. On day 45, he presented a nasal lesion. The nasal biopsy showed a positive direct examination and development of the *F. solani* complex. On day 47, a surgical toilette of the foot lesion was performed. The patient had a favorable outcome with voriconazole 400 mg/day until hematopoietic cell transplantation.

Conclusion: Evaluation of skin lesions in severely immunocompromised patients allows prompt diagnosis for antifungal treatment and appropriate debridement in patients with a proven mycological diagnosis of disseminated fusariosis.