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Monitoring of *candida* colonization in the respiratory tract of COVID-19 cases

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Objectives: Opportunistic yeasts potentially cause infection or colonization in the lower respiratory tract. *Candida albicans* is a common agent of yeast infections but other yeasts such as non-*albicans Candida* are important as resistant fungi to antifungal drugs. The predisposing factors for the overgrowth and invasion by *Candida* species include corticosteroid therapies, long-time hospitalization, antibiotic therapies, and primary infections by Mycobacterium tuberculosis and viral agents. The screening of *Candida* colonization in the lower respiratory tract of the cases with a history of COVID-19 was performed in this study at a great training hospital in Northwest of Iran.

Methods: During the pandemic COVID-19, about 445 cases with severe COVID-19 hospitalized and used dexamethasone were investigated for Candida infections and colonization by the laboratory data of Medical Mycology Center, UMS University, Urmia, Iran. Our subjects were sputum, bronco-alveolar and bronchial specimens. *Candida* elements including pseudo-hypha and blasto-spores microscopically were investigated. Differential cultures and PCR-RFLP were used for the identification of *Candida* yeasts at the level of species.

Results: Totally, 54 yeast overgrowth was detected in the clinical specimens including *Candida albicans* 28 (51.8%), non-*albicans Candida* species 24 (44.4%) and a case of *Pneumocystis jirovecci*. All of the cases with *Candida* detections were Covid-19 positive. Moreover, two cases of rhino-cerebral Mucomycosis, two cases of TB, two cases of asthma, and one case of cystic fibrosis were included.

Conclusion: As a conclusion, Fungi especially *Candida* yeasts be considered as the potential pathogens in cases with a history of severe COVID-19 and corticosteroid therapy during stay at the hospital.

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Candida auris candidemia in COVID-19 and post-COVID-19 patients in a tertiary care hospital in North India

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Introduction: *Candida* spp. accounts for 70%-80% of invasive bloodstream fungal infections. It is most commonly spread in long-term care facilities, caring for people with severe medical conditions. Patients hospitalized for COVID-19 are at risk for healthcare-associated infections like candidemia. *Candida auris* is an emerging, multidrug-resistant, healthcare-associated fungal pathogen. *Candida auris* is currently one of the most common clinical fungal pathogens, causing nosocomial infections. Due to its higher drug-resistance rate, *C. auris* is more difficult to treat, requires longer hospitalization periods, and results in higher morbidity and mortality than other *Candida* species.

Aim and Objectives: To analyze the risk factors associated with *C. auris* candidemia in COVID-19 and post-COVID-19 patients at tertiary care center.

Material and Methods: We prospectively analyzed all positive blood samples which were received in the Microbiology department at SGPGI, Lucknow for a period of 1 year (March 2020-March 2021). Blood samples were inoculated and cultured in BACTEC Bottles (BD) and incubated for 5 days at 37°C. The bottles which flagged positive, a Gram's stain was performed and were sub-cultured on SDA for isolation of yeast colonies. Isolated yeasts were identified by phenotypic method and confirmed by MALDI-TOF MS. Demographics details of the patients were collected and recorded. The significant associated risk factors with *C. auris* candidemia were analyzed.

Results: A total of 13 000 blood samples were received during the 1-year study period from different departments of the hospital.1.25% ($n = 163$) of the blood culture samples were positive for candidemia. Out of 163 *Candida* culture-positive blood samples, 27.61% ($n = 45$) were *C. auris*. A total of 64% ($n = 29$) *C. auris* candidemia was seen in non-COVID-19 patients, 31.1% ($n = 14$) in COVID-19 patients, and two patients had a history of post-COVID-19 infection. The associated risk factors included the use of broad-spectrum antibiotics, intravenous catheterization, underlying respiratory illness, mechanical ventilation, use of steroids, and dialysis. A total of 46.6% ($n = 21$) mortality was seen with *C. auris* candidemia.

Conclusions: *Candida auris* candidemia continues to be a threat in hospitalized patients. This study shows prevalence of *C. auris* candidemia in COVID-19 and post-COVID-19 patients with 47% mortality. *Candida auris* is continuously reported from different departments in our institute, especially from intensive care units with high morbidity and mortality. An alertness, awareness and infection control practices by the healthcare personnel will help in early diagnosis and appropriate antifungal therapy and control the spread of *C. auris*.

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Epidemiology of human fusariosis in Greece: results from a 16-year nationwide multicenter survey

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Objectives: Fusariosis in humans comprises a vast array of rare but serious and difficult-to-treat infections, ranging from keratitis and onychomycosis in immunocompetent hosts to life-threatening systemic infections in immunocompromised patients such as those with hematologic malignancies. We aimed to assess the disease burden and baseline epidemiology of fusariosis in Greece.

Methods: From 2004 through 2020 a prospective, nationwide, multicenter survey took place. Demographic and clinical data of fusariosis cases were recorded. *Fusarium* strains isolated were identified to species level with molecular methods and/or MALDI-TOF MS, and tested for antifungal susceptibility in vitro with the EUCAST methodology.

Results: A total of 54 cases were registered. The most frequent infection was keratitis ($n = 21$, 39%), followed by bloodstream infections in patients with hematologic malignancy ($n = 12$, 22.2%). Other infections involved the respiratory tract ($n = 3$, 5.5%), and sinuses ($n = 3$, 5.5%) in immunocompromised patients, soft tissues after trauma ($n = 5$, 9.3%), or diabetic foot ($n = 2$, 3.7%), and onychomycosis ($n = 8$, 14.8%). The estimated incidence of invasive *Fusarium* infections was 2.9 cases/year (0.027 cases/100 000 population). The most frequently isolated species were: *F. solani* species complex (SC) ($n = 13$, 24%), *F. oxysporum* SC (13, 24%), *F. fujikuroi* SC ($n = 12$, 22.2%, of which 6 *F. verticillioides* and 6 *F. proliferatum*). Other SCs included *F. brachygibbosum*, *F. chlamydosporum*, and *F. dimerum*. In keratitis cases, *F. solani* was associated with infection secondary to injury with plant material, whereas *F. fujikuroi* with soft contact lens wear. *Fusarium oxysporum* was more frequently isolated from nails or soft tissue infections (53.8%). Antifungal MICs were high, with no clear interspecies differences (geometric mean 1.6, 2.5, 3.2 mg/l for amphotericin B, voriconazole, and posaconazole, respectively, median values 2, 4, 8 mg/L, respectively). Fluconazole and the echinocandins showed no activity (MIC >32 mg/l). The most frequently used antifungals were amphotericin B and voriconazole, usually in combination. Treatment failure in keratitis was 38.5%. In patients with hematologic malignancy the crude mortality rate was 71.4%, usually related to the underlying disease. Soft tissue infections complicating diabetic foot or trauma were treated surgically, with favorable outcomes.

Conclusion: *Fusarium* infections in Greece remain rare, but with considerable morbidity and mortality in the immunocompromised. Early diagnosis and initiation of the appropriate treatment were critical for a successful outcome in keratitis cases, despite moderately high MICs of the antifungals used.

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Disseminated Histoplasmosis in an immunocompetent patient in a tertiary care center in North India

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Objectives: Histoplasmosis is a geographically restricted dimorphic fungi that causes disseminated infection in immunecompetent as well as immunocompromised patients. Adrenal involvement is seen in disseminated disease but sometimes it may be the only site where then infection can be demonstrated. Early diagnosis and treatment are needed to save the patient from fatal adrenal insufficiency. We present a case of bilateral adrenal histoplasmosis in immunocompetent patient.

Methods: A 63-year-old male presented to our hospital with a history of insidious onset of decreased appetite and unintentional weight loss for the last 6 months associated with generalized weakness. Patient had a history of mild to moderate intensity epigastric pain and discomfort which was intermittent in nature. Patient originally belongs to Azamgarh, Uttar Pradesh, but he was residing in Kolkata for the last 8 months.

Patient had no history of fever, cough, hemoptysis, jaundice, chronic diarrhea, and steatorrhea. No history of orthostatic hypotension, salt craving, hyperpigmentation, headache, visual field disturbances, polyuria, behavioral changes, episodic headache, palpitation, diaphoresis, systemic hypertension with episodic all four-limb weakness. There was no history of abdominal striae, easy bruisability, difficulty in standing from squatting position. There was no history of tuberculosis among family members. On detailed history, it was revealed that he fed pigeons every day in the slum house where he lived in Kolkata.

On the CECT abdomen it was found that there is an ill-defined hypodense enhancing lesion (72 × 52 × 77 mm) in right suprarenal region and bulky, necrosed 25 × 26 × 19 mm lesion in left suprarenal gland associated with multiple nonnecrotic paraaortic and aortic caval lymphadenopathy. He also received empirical anti-tubercular therapy for 15 days in the form of ethambutol and levofloxacin.

Results: In all, 10% KOH wet mount of crushed smear of adrenal biopsy samples showed tissue debris and small narrow neck budding yeasts. Giemsa stain shows few small budding yeasts. Culture was put in SDA at 25°C and 37°C and incubated. On day 12, growth of colony in 25°C appears as white cottony growth with yellowish white reverse. On day 24, colony appears as buff brown with yellowish brown reverse. LPCB was done from the colony showing presence of characteristic tuberculate macroconidia (8–14) μm in diameter formed on short, hyaline, undifferentiated conidiophores and production of plenty round to pyriform microconidia (2–4 μm) in diameter, occurring on short branches and directly on the sides of the hyphae. Based on the direct microscopy and culture characteristics a diagnosis of Histoplasma capsulatum was given.

Conclusion: Systemic histoplasmosis is typically acquired through inhalation of microconidia or small hyphal elements in soil contaminated with bird and bat droppings leading to primary infection. This patient only manifested bilateral adrenal involvement with nonspecific symptoms.