Cryptococcosis screening and isolates characterization in asymptomatic people living with HIV in Kinshasa, DRC

Biev Zemo1, Rosalie Sachel2, Hippolyte Shuakahanza Nani-Tuma2, Alphonse Maveange4, Justin Anyshayi Mwambi1, Mamie Etondo3, Daoukin Muhandoza Kasumba1, Michel Moutchene2, Georges Mumbi Lalo3, Marie-Pierre Hayette2

1) Molecular Biology Service, Department of Basic Sciences, Faculty of Medicine, University of Kinshasa, Kinshasa, Congo (the Democratic Republic of the)
2) Infectious Disease Service, Department of Internal Medicine/Department of Tropical Medicine, Faculty of Medicine, University of Kinshasa, Kinshasa, Congo (the Democratic Republic of the)
3) Medical and psychosocial management unit for PLHIV, Internal Medicine Department, Centre Médical et Evangélique Revenir Dupuy, Kinshasa, Congo (the Democratic Republic of the)
4) Medical and psychosocial management unit for PLHIV, Internal Medicine Department, Centre Hospitalier René Baudouin 1er, Kinshasa, Congo (the Democratic Republic of the)
5) Medical and psychosocial management unit for PLHIV, Internal Medicine Department, Centre Hospitalier Mire et Enfant de NGABA, Kinshasa, Congo (the Democratic Republic of the)
6) Department of Infectious Diseases and General Internal Medicine, University Hospital Center of Liege, Liege, Belgium

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Objective: Cryptococcal meningitis (CM) is a life-threatening invasive mycosis affecting people living with HIV (PLHIV) and has a high prevalence and case-fatality rate in sub-Saharan Africa. While most PLHIV presenting CM are symptomatic, the asymptomatic ones are diagnosed following routine screening not indicated for all advanced PLHIV (CD4 <200 μl). We, therefore, hypothesized that asymptomatic CM patients would be infected with different Cryptococcus spp. strains than those in symptomatic CM patients (entering to the parallel study conducted in the same clinic). This study describes the prevalence of serum and meningeal cryptococcus in asymptomatic PLHIV presenting a CD4 count of < 200 μl in the screening context.

Methods: We performed cross-sectional screening for serum cryptococcal antigen (CrAg) in ambulant PLHIV with CD4 <200 μl in three clinics in Kinshasa (DRC). Lumbar puncture was indicated in positive patients to exclude a meningal localization for therapeutic purposes. The resulting cerebrospinal fluid (CSF) was analyzed for CrAg and Cryptococcus spp. was isolated and characterized by MALDI-TOF MS, sequencing, and multilocus sequence typing (MLST). In addition, the EUCAST E.Del7.3 microdilution procedure was followed to determine the susceptibility of strains to antifungal agents.

Results: A total of 47 PLHIV out of 242 included were found positive for serum CrAg (19%, 95% CI: 14.2-24.3%) from which 46.8% (22/46) had a high antigen titer (>1/160). The prevalence of asymptomatic CM was then estimated at 55% in CrAg serum-positive patients who consented to lumbar puncture (19/38). Although the female proportion included in the study was higher than that of men, serum CrAg was more positive in men (21.4%, 18/86 cases included) than in women (18.6%, 7/38).
women included). While the mean CD4 count of CtAg-serum-positive patients was significantly lower than that of negative patients (P < 0.05), the median viral load between the two patient groups was approximately similar (P = 0.05). Only four Cq samples were positive in cultures for Cryptococcus spp. and were all characterized as Cryptococcus neoformans var. Grisea.

At this stage, two isolates have been analyzed using the IHHAM MLST scheme and two different sequence type (ST) profiles were identified, namely: ST93 and ST63. While ST93 is the main Cryptococcus neoformans profile described in Congolese (DRC) PLHIV with CM, ST63 has not yet been identified in the DRC before. Of note, epidemiological and clinical specifics of ST63 have so far been poorly characterized in the literature. Susceptibility testing against the major antifungals and the MLST typing of the two remaining strains are still ongoing.

Conclusions: The prevalence of cryptococcosis should not be neglected among asymptomatic PLHIV in the DRC, as meaning that screening and preventive treatment measures should be integrated into the national policy for HIV management and related diseases. For the rest of the analyses still in progress, conclusions can only be drawn once they have been fully finalized.

PM2
Spread of sporotrichosis brasiliensis from the sneeze of infected cats: a potential novel route of transmission

Fernanda Bastos1, Marcelo Farías2, Fabiana Moni2, Regisley Coqtral1, Lili Lopuch1, Adriana Gabriël1, Vaniza Vicente1, Emanuelli Nazzini1, Karen Wu1, Flavio Queiroz-Sellès1
1Pontifical Catholic University of Paraná, Curitiba, Brazil
2Centers for Disease Control and Prevention, Atlanta, EUA

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Objectives: Cat-transmitted sporotrichosis (CTS), caused by Sporothrix brasiliensis, is an emerging fungal disease that has become a major public health concern in Brazil. Transmission of CTS usually occurs through the implantation (e.g., scratching or bites) of infectious yeasts from feline Sporothrix lesions. Recent reports on transmission events have suggested that S. brasiliensis might be transmitted through feline respiratory droplets created while sneezing. The aim of our study is to determine whether infectious respiratory secretions are expelled when cats with sporotrichosis sneeze.

Methods: We collected respiratory secretions expelled while sneezing from 28 cats diagnosed with sporotrichosis. We placed a Mycobol agar plate, a fungal culture medium, in front of the animals’ nostrils and used a nasal swab to stimulate sneezing (Fig. 1). Samples were incubated at 28–30°C for 4 weeks in the Mycology laboratory of Hospital da Criança. Molecular identification of the isolates was performed by sequencing the calbd30 gene. The infected cats enrolled in the study were subsequently treated at the School Veterinary Clinic of the Pontifical Catholic University of Paraná, a referral hospital for the treatment of feline sporotrichosis.

Results: One of the 28 respiratory sample collected, 20 (71%) had evidence of fungal growth morphologically consistent with Sporothrix. Sequencing of all isolates identified Sporothrix brasiliensis (Fig. 2).

Conclusions: We identified a possible novel route of transmission of Sporothrix spp. through infectious feline respiratory secretions expelled during sneezing. The respiratory droplets expelled by a sneeze may contain viable Sporothrix yeast that could infect humans and other animals after mucosal exposure. One health partner and collaborators such as veterinarians, physicians, health authorities, epidemiologists, and fungal disease researchers should be made aware of the potential spread of Sporothrix through respiratory droplets and sneezing to prevent and control the further spread of CTS. To prevent cat-to-human transmission of Sporothrix brasiliensis, personal protective equipment (PPE) should be worn while handling a cat with suspected sporotrichosis. Veterinarians, veterinary clinic employees, students, and pet shop owners are at increased risk due to their professions. Veterinary cats frequently frequent procedures that encourage respiratory droplets (e.g., nasal sniffs), contact and other close contact may directly expose staff to infectious secretions. Because this study identified viable yeast in respiratory droplets from sneezing, decontamination of exposed surfaces is increasingly important, as surfaces and objects can serve as fomites for Sporothrix. Physicians who diagnose and treat human cases of sporotrichosis should be aware of this new transmission route to improve clinical suspicion, diagnosis, and treatment for sporotrichosis. Approximately half of the human patients with conjunctival sporotrichosis did not report experiencing traumatic injury from cats; mucosal exposures to infectious yeast is a likely alternative transmission method.