IN VITRO EVALUATION OF PHENOTYPIC CHARACTERISTICS OF Cryptococcus neoformans AND Cryptococcus gatti

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The cryptococcosis is a systemic fungal disease caused by Cryptococcus spp. The pathogenesis involves inhalation of contaminated particles present in the air, especially in bird faeces. Cryptococcus spp. are cosmopolitan fungi and responsible for infections that initiate in the respiratory system and may spread to other sites, particularly to central nervous system. Of the more than 38 species of the genus, two species are epidemiologically important, C. neoformans and C. gattii. The virulence factors of these are polysaccharide capsule, melanin, phospholipase, urease, proteinase and growth at 37°C. This study aimed to evaluate phenotypic characteristics such as virulence capacity and antifungal susceptibility of C. neoformans and C. gattii isolated from cerebrospinal fluid of patients treated at the University Hospital of Maringá (UHM). The study was conducted with C. neoformans and C. gattii stored in mycology collection of Medical Mycology Laboratory of the Universidade Estadual de Maringá (UEM). Isolates were reactivated and confirmed the identification (microscopy, melanin production, urease and biochemical test with l-canavanine glycine bromothymol blue (CGB) agar). In order to assess the virulence, the capsule was stimulated and the diameter measured. Microbicidal activity it was assessed for 120 minutes of exposure of the strains to neutrophil activity. For antifungal susceptibility was used discs (CECON®) previously impregnated with the following antifungal: amphotericin B, ketoconazole, voriconazole, itraconazole and miconazole. The species was confirmed as C. neoformans and C. gattii. Regarding virulence factors analyzed, C. gattii presented higher diameter capsule (3.48 µm ±1.13 µm) than C. neoformans (2.73 µm ± 0.8 micrometers). The microbicidal activity of neutrophils was higher for C. neoformans (approximately 100% yeast killing) compared with C. gatti (approximately 73% yeast killing). For antifungal susceptibility test, both isolates were sensitive to all the drugs studied. Despite the absence of antifungal resistance, the species studied showed differences in virulence profile. C. gattii showed higher development of the capsule and a greater ability to survive kill compared to C. neoformans. These findings contribute to understand the different pathogenesis among C. gattii species and C. neoformans.

Keywords: Antifungals, Cryptococcus spp., Virulence factors.