Title: BIOFILM FORMATION AND SUSCEPTIBILITY TO CASPOFUNGIN OF *C. albicans* BLOODSTREAM ISOLATES FROM HOSPITAL DAS CLÍNICAS OF MEDICAL SCHOOL OF RIBEIRÃO PRETO (HC – FMRP)

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Abstract:

*Candid*a spp. is associated with significant morbidity and mortality rates, especially in certain patient groups. Beyond immunosuppresion and the use of broad range antibiotics, another important risk factor for invasive fungal infections is the use of medical implants such as vascular catheter, orthopedic devices, and prosthetic heart valves, due to the fungal ability to attach the implant surface and form biofilm. Biofilms, structured microbial communities, frequently are the sources of persistent infections where microorganisms acquire enhanced resistance to host defense and to antifungal drugs. Indeed, biofilm formation is an important virulence factor for these opportunistic fungi. *Candida* yeasts are the fourth leading cause of bloodstream infection and some species are the most frequently recovered from bloodstream infections, such as *C. albicans*, *C. glabrata*, *C. parapsilosis* and *C. tropicalis*. However, *C. albicans* is the most prevalent worldwide. Caspofungin represents a new class of antifungal agents, the echinocandins, which inhibits the synthesis of cell wall β-1,3 glucan polysaccharides and is effective on disseminated candidiasis. The aim of this study was to evaluate biofilm production ability by *C. albicans* bloodstream isolates and its impact on the susceptibility profile to caspofungin. A total of 20 isolates were tested for their ability to form biofilm. The MICs for caspofungin against planktonic cells were determined according to the CLSI guidelines for broth microdilution assay. The MIC_{80} for caspofungin against 24 hours-old biofilms were determined using two different methodologies: crystal violet staining (total biomass quantification) and tetrazolium (XTT) reduction assay (metabolic activity quantification). The capacity of the isolates to form biofilm was classified in high and low based on their metabolic activity. All of the 20 *C. albicans* isolates were able to form biofilm: 70% were high biofilm formers, and 30% were low biofilm formers. As expected, 85% of the isolates showed higher MICs to caspofungin in biofilm than in their planktonic counterparts. In planktonic growth, the 20 isolates were susceptible to caspofungin, while in biofilm growth, 60% became resistant. The findings were consistent to previous studies. The determination of biofilm antifungal susceptibility can show critical points that are useful to achieve success in treatment of *Candida* biofilm-associated infections in the studied tertiary care hospital.

Keywords: Candidemia, caspofungin, biofilm, *Candida albicans*.

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