P0012
Poster Session I
News from the fungal frontier

PRODUCTION OF BIOFILM BY CANDIDA AND NON-CANDIDA SPP. ISOLATES CAUSING FUNGEMIA: COMPARISON OF BIOMASS PRODUCTION AND METABOLIC ACTIVITY AND DEVELOPMENT OF A CUT-OFF

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Objectives: Production of biofilm enables *Candida* to cause catheter-related candidemia. Patients infected by biofilm-forming isolates have a poorer prognosis. Biofilm production can be studied by measuring the biomass produced after application of crystal violet stain (CV) or by measuring metabolic activity with XTT. Our study is the first in which CV and XTT are compared to analyze the ability of clinically relevant *Candida* and non-*Candida* species to produce biofilm. Furthermore, we propose cut-offs to classify isolates according to their ability to form biofilm.

Methods: We studied 577 isolates causing fungemia in 512 patients admitted from January 2007 to July 2013 (Table). Both CV and XTT were compared after allowing isolates to form biofilms in 96-well polystyrene trays incubated at 37ºC for 24 hours. Each isolate was tested in triplicate. Based on the biomass production measured by CV and the metabolic activity measured by XTT, strains were divided into terciles to establish tentative cut-offs to classify isolates as being low, moderate, or high biofilm-forming (LBF, MBF, and HBF) and as having low, moderate, or high metabolic activity (LMA, MMA, and HMA).

Results: Considerable variability in biofilm production and metabolic activity was found both between species and within species (Table). *C. tropicalis* showed the highest biomass production, whereas *C. glabrata* showed the highest metabolic activity, and non-*Candida* species isolates showed the lowest metabolic activity (P<0.001). The isolates were classified as LBF, MBF, and HBF according to their cut-offs by XTT (<0.097, 0.097 – 0.2, and >0.2) and as LMA, MMA, and HMA according to their cut-offs by CV (<0.44, 0.44 – 1.17). Most *C. tropicalis* isolates were HBF (80%) or MBF (13%); a high proportion of *C. albicans* isolates were HBF (48%) or MBF (36%). A species-specific pattern was also observed for metabolic activity. *C. glabrata* isolates were HMA (73%) or MMA (18%). Interestingly, more than 30% of isolates of *C. parapsilosis*, *C. tropicalis*, *C. krusei*, *Candida* spp., and other yeasts were LMA. The overall categorical agreement between the procedures was 43.7%, which increased to >50% for *C. albicans* and *C. parapsilosis*.

Conclusions: Species-specific patterns of biofilm production can be observed in yeast isolates causing fungemia. The most common species causing catheter-related bloodstream infection are able to produce biolfim with high biomass or high metabolic activity. XTT and CV are complementary procedures for the study of biofilm production.

Species	n	**XTT (GM ± SD)**	**CV (GM ± SD)**
C. albicans	267	0.168 ± 0.098	1.108 ± 0.614
C. parapsilosis	162	0.155 ± 0.171	0.701 ± 0.558
C. glabrata	60	0.257 ± 0.103	0.277 ± 0.245
C. tropicalis	46	0.132 ± 0.058	1.602 ± 0.597
C. krusei	10	0.136 ± 0.081	0.204 ± 0.125
Candida spp.	19	0.148 ± 0.092	0.397 ± 0.360
Other yeast	13	0.035 ± 0.065	0.247 ± 0.324
Overall	577	0.167 ± 0.125	0.888 ± 0.662