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ePoster Viewing
Basic science: biofilm pathophysiology

BIOFILM PRODUCTION, ADHERENCE CAPACITY, CELLULAR SURFACE HYDROPHOBICITY AND SECRETED ASPARTYL-PROTEASE ACTIVITY OF DIFFERENT SPECIES OF THE GENUS CANDIDA ISOLATED FROM HEMOCULTURES.

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Objectives. Candidemia is a nosocomial infection with a high mortality rate; several species are responsible. Although research on pathogenic yeast has increased, further studies on pathogenicity determinants are still needed. In this study, the presence of virulence factors in *Candida* spp. collected from blood samples is assessed.

Methods. A total of 53 *Candida* spp. strains, isolated during two years (2007-2009) from hemocultures of a tertiary care hospital (Puerta Real University Hospital, Cadiz, Spain) were studied: *C. albicans* (16), *C. parapsilosis* (14), *C. glabrata* (8), *C. orthopsilosis* (6) y *C. tropicalis* (6), *C. krusei* (3). RPMI-1640 medium with glucose 2% was used.
Biofilm formation was evaluated on microtiter plates (1). Biofilm developed for 24 h at 37 ºC in RPMI was quantified by OD_{490} reading; the cut-off value was established as the value of adherence measurement obtained.
Adhesion capacity to polystyrene was assayed on microtiter plates (1) with a PBS cell suspension incubated for 2 h. OD_{490} of the wells with attached cells was read and values OD>0.05 were considered positive.
Cell surface hydrophobicity was assessed by the MATH method (2) and was expressed as the percentage reduction of initial turbidity of the aqueous suspension using the following range: <25% low; 25–50% medium; and >50% high.
Secreted aspartyl proteases (Saps) activity was assayed using an agar test medium with 1.17g yeast carbon base, 0.01g yeast extract and 0.2g bovine serum albumin as the nitrogen source. The cleavage of albumin by Saps results in a clearance zone. The Pz index is obtained by dividing the diameter of the colony by the halo produced (3).

Results. A significant relationship exists between adherence capacity and hydrophobicity (P=0.001), but not with the rest of the parameters, suggest that different mechanisms are involved. *C. albicans* is non-hydrophobic and slightly adherent although it is highly biofilm-producing and is the species with greatest enzymatic activity. *C. tropicalis*, which also has filamentation ability, is hydrophobic, adherent, biofilm-producing and with medium enzymatic activity. *C. parapsilosis* sensu stricto is more hydrophobic, adherent, biofilm-producing and with greater enzymatic activity than *C. orthopsilosis*, although it produces less biofilm than *C. albicans* and *C. tropicalis. C. glabrata* and *C. krusei* are hydrophobic and adherent but not biofilm-producing, nor do they have aspartyl protease activity.

CONCLUSION. There is a high level of species variability with regard to the presence of the pathogenicity factors studied: *C. albicans* is the species with greatest biofilm-forming capacity and Saps activity, followed by *C. tropicalis* and *C. parapsilosis* sensu stricto.

REFERENCES

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