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Candida tropicalis fungaemia virulence factors and MTL configuration of the strains

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Objective. *Candida tropicalis* is an emerging species and little is known about its pathogenicity determinants and mating capacity. The aim of this study was to evaluate in strains isolated from hemocultures the presence of some virulence factors and to determine their *MTL* configuration.

Methods. A) Six clinical isolates of different patients with candidemia from a University Tertiary Hospital and two control strains were studied. We also analyzed the presence of risk factors of the six patients.
B) Different virulence factors were evaluated: cellular surface hydrophobicity (CSH) by the MATH method (Hazen et al); adherence capacity and biofilm formation on polystyrene microtitration plates (Blanco et al), and the ALSt-1 (agglutinin-like sequence) gene expression in planktonic and in biofilm (sessile) cells (Hoyer et al). RT-PCR was performed to determine the expression of the ALSt-1 gene. Primers sequences were: ALSt-1-Forward: 5'-CACAGGTTTTGATACGATGTTCATG-3'; ALSt-1-Reverse: 5'-CCAGTCTTGGCAAAATCAACA-3'.
C) The *MTL* configuration was assayed by PCR, using primers specific for *MTL*a and *MTL*α (Porman et al).

Results. A) All patients had venous catheter, had received prior antibiotic treatment and 50% had parenteral nutrition. Patients were 4 adults, 1 child and 1 premature neonate. Four of the 6 patients died.
B) All clinical isolates of *C. tropicalis* were biofilm-forming (OD>0.11), with 3 highly producing strains (OD>0.3); all were hydrophobic (CSH range 35-82%) and were adherent to polystyrene (OD range 0.06-0.10). ALSt-1 gene expression was quantified, the relative value of the expression in sessile cells was obtained when compared with the expression in their planktonic counterparts, and it was found that expression was increased x 3.12$\pm$1.37 in biofilm cells; no significant differences in ALSt-1 gene expression between high and low biofilm-producing strains were found.
C) One of the 6 isolates was homozygous at the *MTL* locus (*MTL*a), highly biofilm-forming, and the remaining strains were heterozygous (MTLa/MTLa).
The control strains (both heterozygous), however, were hydrophilic (0-13%), non-adherent (OD 0.03-0.04) and non-biofilm-producers (OD 0.06-0.07).

Conclusions. All clinical isolates, both the heterozygous strains and the homozygous one, had important virulence factors; all were biofilm-producers and the biofilm cells presented an overexpression of the ALSt-1 gene. The homozygous strain is mating-competent, allowing gene exchange during colonization and infection. Future research with more clinical isolates is needed to confirm these data and their clinical significance.

References

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