CHARACTERIZATION OF *Candida* SPECIES FROM CLINICAL SOURCES IN NAIROBI, KENYA

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ABSTRACT

Candida is a yeast of economic importance as it causes infections of the esophageal, oral, anorectal, vaginal mucosa; eyes, nails as well as life threatening fungemia.They are among emerging opportunistic pathogens especially due to HIV / AIDS. Emerging resistance to commonly used antifungal drugs has further complicated their management resulting in increased morbidity and mortality. The present study analyzed phenotypic and molecular characteristics of *Candida* strains from clinical sources in Nairobi. Drug susceptibility profiles of all the *Candida* isolates were also analyzed. A total of one hundred and fifty (150) *Candida* species isolated since 1997 at Kenya Medical Research Institute (KEMRI), Mycology laboratory were characterized. Preliminary identification was done using germ tube test, CHROMagar *Candida*, Corn meal agar, and confirmed using Analytical profile index (API 20 C aux). Genotypic analysis was done using primer pairs that span the site of the transposable intron in the 25S rDNA. Antifungal drug susceptibility to Fluconazole, Nystatin, Clotrimazole and Amphotericin B was performed using broth microdilution techniques.

The isolates were recovered from swabs 37.3 %, urine 33.3 %, sputum 16.7 %, aspirates 8 %, blood 3.3 %, CSF and others 0.7 %. Out of the 150 isolates 86.7 % were *Candida albicans* whereas 13.3 % were non *albicans Candida* as confirmed by API 20 C aux. Non *albicans Candida* included; *C. parapsilosis* 4 %, *C. tropicalis* 2.7 %, *C. krusei* 2.7 %, *C. guilliemondii* 1.3 %, *C. glabrata* 1.3 % and *C. famata* 1.3 %. Germ tube positive *C. albicans* were 96.1 % whereas only 3.8 % were germ tube negative. All the 130 isolates identified as *C. albicans* formed chlamydospores and all grew at both 37 °C and 45 °C ruling out the possibility of *Candida dubliniensis.* Genotypic analysis indicated that most of the *C. albicans* were genotype A (60 %) with one band of 450 base pairs followed by genotype C (16 %) with two bands of 450

and 650 base pairs and B (8 %) with 1 band of 650 base pairs. In this study 4 % of the *C. albicans* isolates were categorized as genotype F that had one band of 550 base pairs.The isolates were fairly susceptible to commonly used antifungal drugs. *C. albicans* susceptibility to Fluconazole (MIC ≤ 8 µg/ml) was 73.1 %, susceptible dose-dependent (MIC 16-32 µg / ml) 14.6 % and resistant (MIC ≥ 64 µg / ml) 12.3 %. The MIC_{50} and MIC_{90} to Fluconazole were 1 µg / ml and 64 µg / ml respectively. At 1 µg / ml of Amphotericin B, most of the isolates were inhibited with 90.3 % having an MIC of ≤ 1 µg / ml. The MIC_{50} and MIC_{90} to Amphotericin B were 0.25 µg / ml and 1.0 µg / ml respectively. Elevated MIC ≥ 4 µg / ml to Clotrimazole and Nystatin were demonstrated in 80.5 % and 90.5 % respectively. The MIC_{50} and MIC_{90} of Clotrimazole and Nystatin were 1.0 µg / ml, 0.29 µg / ml and 16 µg / ml, 18.5 µg / ml respectively. The rest (20) non-*albicans Candida* were fairly susceptible to all the four drugs with reduced susceptibility reported on very few isolates.From the study *C. albicans* was the most prevalent and hence the most common cause of candidiasis. The result has demonstrated some evidence of emerging resistance to commonly used antifungal drugs. For management of *Candida* infection, there is need to identify all the yeast from clinical sources as some have intrinsic resistance to commonly used antifungal drugs. There is also need to constantly carry out *in-vitro* antifungal susceptibility testing in order to establish any emerging resistance. This is essential in the management of *Candida* infections especially in HIV / AIDS where recurrent candidiasis is common.