Prevalence, identification and antifungal susceptibility pattern of *Candida* species isolated from Iranian HIV patients with oropharyngeal candidiasis

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Objectives:

Candidiasis is an important opportunistic fungal infection in hospitalized patients as well as in immunocompromised individuals especially in cancer-treated patients, organ transplant recipients and HIV-infected persons. Oropharyngeal candidiasis (OPC) is a common mucocutaneous infection in more than 90% of the HIV-infected patients, particularly in the early and advanced stages of AIDS. In this study we identified the *Candida* species isolated from oral cavity of Iranian HIV/AIDS patients by conventional and molecular methods, as well as antifungal susceptibility test for *Candida* strains against five antifungal agents examined

Methods:

Herein, Specimens were obtained by sterile cotton swab from the tongue and buccal mucosa lesions from 150 HIV-positive patients admitted at the HIV Health Centers in Tehran, Iran. The samples cultured on Sabouraud-dextrose agar and identified by conventional, PCR amplification and Sequencing of ITS region. Minimum inhibitory concentration (MIC) of 102 *Candida* spp. was performed against itraconazole, fluconazole, voriconazole, caspofungin, and amphotericin B, using the broth microdilution assay according to the Clinical and Laboratory Standard Institute (CLSI; protocol M27-S3). Breakpoint for fluconazole, voriconazole, caspofungin provided by CLSI M27-S4 recommendation.

Results

Eighty nine patients (59.3%) had positive culture for *Candida* and presented clinical signals of classical oral candidiasis. In this group, 102 morphologically distinct colonies were recovered and subsequently identified by polymerase chain reaction (PCR) and sequencing assay, presenting the following frequency: 54 *C. albicans* (52.9%), 16 *C. dubliniensis* (15.7%), 12 *C. tropicalis* (11.8%), 9 *C. glabrata* (8.8%), 7 *C. kefyr* (6.9%) and 4 *C. africana* (3.9%). Additionally, multiple *Candida* species were co-isolated from 13.5% (12/89) patients. Regarding the antifungal susceptibility test, all *Candida* isolates were susceptible to amphotericin B and caspofungin, while some of them were resistant to fluconazole (17.6%; 16 *C. albicans*, 1 *C. dubliniensis* and 1 *C. glabrata*), itraconazole (16.7%; 15 *C. albicans*, 1 *C. dubliniensis* and 1 *C. tropicalis*) and voriconazole (5.9%; 5 *C. albicans* and 1 *C. tropicalis*).

Conclusion:

Taken together, our finding displayed that HIV/AIDS patients are susceptible to oral candidiasis-related to host factors. Early and accurate detection of OPC could result in better outcome in infected patients. Even with the prophylaxis and treatment with antifungal agents, the increasing of resistance to common antifungal drugs in HIV-infected individuals has been noticed. Finding reinforces the urgent necessity to address alternative therapeutic agents for treating oral candidiasis in HIV-positive patients due to the high incidence of azole-resistant *C. albicans* strains and the increase frequency of non-albicans *Candida* species.

Keywords: HIV; AIDS; Oropharyngeal candidiasis; *Candida* species; Antifungal susceptibility