Drug susceptibility profiles of Candida species isolated from the oral mucosa of HIV-positive West African patients using the TREK Sensititre system

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Abstract

Background: Candida infections are a common cause of death in immunocompromised patients. The prevalence and antifungal drug susceptibility profiles of Candida species from Cameroon in Africa are unavailable. This study was prompted by an increasing incidence of treatment failure. Drug susceptibility profiles, necessary to improve treatment outcomes, is particularly important in countries where the use of antimicrobials and antifungals is uncontrolled and resistance may emerge due to the indiscriminate use.

Objective: The goal of this study was to characterize and determine drug susceptibility of oral Candida species in Cameroonian patients with HIV/AIDS.

Materials and Methods: Candida species were isolated from the oral cavity of 126 HIV-positive patients attending a local HIV/AIDS clinic in the Cameroon. Drug susceptibility to azoles and echinocandins was determined using the commercial TREK Sensititre® YeastOne® platform that provides the minimal inhibitory concentration of amphotericin B, 5-flucytosine, caspofungin, micafungin, fluconazole, itraconazole, posaconazole, voriconazole.

Results: Ninety-two isolates identified as Candida albicans. More than 50% of C. albicans isolated were resistant to azoles but 115 Candida species (87%) were susceptible to amphotericin B. Twenty-one of the twenty-four C. glabrata (ID1) isolates were resistant to flucytosine. The majority of Cameroonian Candida species were sensitive to fluconazole (75%) and echinocandins (79%).

Conclusions: The report ofazole resistance in all Candida species isolated from immunocompromised patients in Cameroon is a new and important observation. This study was not able to identify the antifungal resistance patterns of the other azole drugs tested. It is suggested that the dispensing of these azoles should not be arbitrary, as this promotes antifungal resistance and may lead to increased drug costs. The need for a simple antifungal drug susceptibility platform for use in clinical laboratories is imperative, as the emergence of resistant Candida species is of concern. The use of the TREK Sensititre platform for drug susceptibility testing can be done rapidly and with minimal training and reagents and is therefore a promising method for use in resource-limited laboratories in Africa. This study points out that fluconazole, the most widely available medication for C. albicans infections in the African continent, is only working on half of the patients or less. The same occurs in the case of the other azole drugs tested. It is suggested that the dispensing of these azoles should not be arbitrary, as this promotes antifungal resistance and may lead to increased drug costs.

Introduction

HIV-infected individuals are prone to Candida species infections, which can result in increased patient morbidity and mortality due to opportunistic or systemic dissemination. The need for antifungal drug susceptibility in the African continent is imperative, due to high infection rates, the lack of surveillance and the uncontrolled distribution of medications, which can result in increased drug resistance. This is especially true in resource-poor countries, where very few related studies have been done.

The TREK Sensititre YeastOne 9 (Y90) system is a broth microdilution method that provides multiple antifungal drug susceptibility testing. This methodology has the advantage of being standardized to the Clinical and Laboratory Standards Institute (CLSI) standards (Eraso et al, 2008, Pfäffle et al, 2012). The technology consists of microtiter plates embedded with nine different drugs (amphotericin, caspofungin, 5-flucytosine, posaconazole, voriconazole, itraconazole, fluconazole and amphotericin B) in ascending concentrations. The wells are coated with a colorimetric agent, allowing for the minimum inhibitory concentration (MIC) of each drug to be easily detected with the naked eye and with the supplied Vision computer-assisted plate reading software.

The objective of this study was to investigate the drug susceptibility profiles of different Candida species isolated from HIV-infected Cameroonian patients using the TREK Sensititre system.

Discussion

The need for a simple antifungal drug susceptibility platform for use in clinical laboratories is imperative, as the emergence of resistant Candida species is a cause of concern. The use of the TREK Sensititre platform for drug susceptibility testing can be done rapidly and with minimal training and reagents and is therefore a promising method for use in resource-limited laboratories in Africa. This study points out that fluconazole, the most widely available medication for C. albicans infections in the African continent, is only working on half of the patients or less. The same occurs in the case of the other azole drugs tested. It is suggested that the dispensing of these azoles should not be arbitrary, as this promotes antifungal resistance and may lead to increased drug costs.

Dispensing should be based upon known antibiotic susceptibility profiles of the population.

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References

