Itraconazole and voriconazole resistance profiles in candida isolates from Nairobi Metropolitan City public referral hospitals

Abstract

Background: The emergence and spread of azole antifungal drug resistance including cross-resistance hinders their effective utilization in the therapy and prophylaxis of candidiasis.

Methods: This study analysed the itraconazole and voriconazole anti-fungal sensitivity profiles of candida isolates from clinical specimens from candidiasis patients in Nairobi County. Antifungal susceptibility and Minimum Inhibition Concentrations (MICs) were performed using broth microdilution tests, on isolates of *C. albicans* (n=94) and non-*albicans* candida (n=46).

Results: Phenotypic characterisation of antifungal resistance showed low sensitivity rates to itraconazole (21.3%) and voriconazole (24.5%) with high cross-resistance (74.5%) in the C. candida isolates. Among the non-albicans candida sensitivity for itraconazole, voriconazole, and cross-resistance were: *C. glabrata* (8.7%, 13.0% and 87.0%); *C. parapsilosis* (36.4%, 45.5% and 54.5%); *C. tropicalis* (40.0%, 60.0% and 40.0%); *C. krusei* (0.0%, 33.3% and 66.7%); *C. famata* (50.0%, 50.0% and 50.0%); and *C. guilliemondii* (0.0%, 50.0% and 50.0%), respectively. MIC analyses of the sensitive isolates showed that *C. albicans* had MIC_{50} and MIC_{90} mean (range) of 0.125 and 0.250 (0.031-0.500) mg/ml for itraconazole; and 0.250 and 0.250 (0.031-1.000) mg/ml for voriconazole, respectively. For non-albicans candida, the MIC_{50} and MIC_{90} mean (range) were, 0.063 and 0.125 (0.025-0.500) mg/ml for itraconazole; and 0.094 and 0.250 (0.031-1.250) mg/ml for voriconazole.

Conclusion: Both *C. albicans* and non-albicans candida have low rates of sensitivity and concurrent high cross-resistance to itraconazole and voriconazole; with the former also exhibiting higher MICs in comparison to the later. The implications of these results include adoption of combination and/or use of different antifungal agents for candidiasis treatment and prophylaxis.

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