Study On Post-Antifungal Effect (PAFE) of certain antifungal agents on *Candida* species and its impact on fungal virulence factors

Abstract

The study was conducted to determine the Post-antifungal effect (PAFE) induced by polyenes and azoles singly and/or combined, against clinical isolates of *Candida* species. The study was also focused on investigating the impact of PAFE on the candidal virulence factors, including germ tube formation (GTF), cell surface hydrophobicity (CSH), and adherence. The obtained results showed that the duration of the PAFEs of nystatin, fluconazole, ketoconazole, miconazole, and the combined (nystatin-ketoconazole) ranged from: (0.3-3 h), (0.3-1.2 h), (-1.4 -1 h), (0.3 -7.7 h), (0.7- 8 h) respectively, depending on the concentration and the species tested. When the antifungal's inhibitory effect on GTF of *C. albicans* was investigated during the PAFE period, it was found that almost total suppression of GTF was observed following 1 h exposure to nystatin singly, and the combined (nystatin – ketoconazole), while exposure to miconazole and ketoconazole caused less marked suppression of GTF. On the other hand, fluconazole induced very limited suppression of GTF. Transmission electron microscopy investigations of the antifungal-exposed *C. albicans* cells revealed suppressed attempts of germ tube formation. The lengths of germ tubes were in the following order: control (unexposed) > fluconazole > ketoconazole > miconazole > nystatin > combined (nystatin – ketoconazole) exposed cells. When the reduction in CSH was determined during PAFE period, it was observed that nystatin, and the combined (nystatin – ketoconazole) induced the highest reduction in CSH, while fluconazole induced only a limited reduction in the CSH. The impact of the tested antifungals on candidal adhesion to urinary catheters during the PAFE period was investigated. It was observed that the combined (nystatin- ketoconazole) caused the greatest reduction in adhesion, followed by nystatin, then miconazole, then ketoconazole, and finally was fluconazole, which caused limited reduction in the adhesion.