

ABSTRACT

Charles University in Prague, Faculty of Pharmacy in Hradec Králové

Department: Department of Biological and Medical Sciences

Study program: Laboratory diagnostics in healthcare

Author: Aneta Kuštová

Supervisor of bachelor thesis: RNDr. Klára Konečná, Ph.D.

Title of bachelor thesis: Selected clinically relevant fungal agents and their susceptibility to antifungal drugs

Background: The aim of the theoretical part of this thesis was to briefly characterize selected clinically important representatives of yeasts and filamentous micromycetes and to introduce the most commonly used antifungal agents. In the experimental part, the main objective was to assess the susceptibility of selected mycotic agents, namely *Candida auris*, *Cryptococcus neoformans*, *Pseudallescheria boydii*, *Mucor indicus* and *Fusarium solani* to selected antifungal agents.

Methods: In order to test the susceptibility of selected mycotic agents to the antifungal drugs amphotericin B, voriconazole and anidulafungin, a microdilution broth method was performed according to EUCAST guidelines with minor methodological modifications. Spectrophotometric detection was used to determine inhibitory concentration values. To determine the susceptibility of selected mycotic agents to voriconazole and anidulafungin, IC₅₀ values were determined. For the determination of susceptibility to amphotericin B, IC₉₀ values were determined.

Results: Within the evaluation of the susceptibility of fungal strains, *C. auris* showed the highest sensitivity to the tested antifungal agents within the tested concentration range, particularly to anidulafungin (IC₅₀ = 0,03125 mg/L). In contrast, *F. solani* demonstrated the lowest susceptibility to the tested antifungals, with IC (IC₉₀/IC₅₀) values >16 mg/L for all tested agents.

Conclusions: The tested yeasts exhibited higher susceptibility to the antifungal agents than the tested filamentous micromycetes. The *C. auris* showed the highest sensitivity, especially to anidulafungin, followed by voriconazole. In *C. neoformans*, the highest sensitivity was observed to voriconazole. The filamentous micromycetes *F. solani* and *P. boydii* demonstrated low susceptibility to all tested antifungals. The *M. indicus* strain showed the highest sensitivity to amphotericin B. The results of the experimental work highlight the variability in the responses of fungal agents to antifungal drugs, underlining the importance of their further testing and researches. The acquired knowledge will be used for future research aimed at the optimisation of combination antifungal therapies.

Keywords: mycotic pathogenic agents, antifungal drugs, antimicrobial resistance