Investigation of in vitro antifungal susceptibility testing and genetic diversity of clinical isolates of Trichophyton benhamiae and Trichophyton eriotrephon in Iran

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Abstract

Background: Trichophyton benhamiae is a zoophilic dermatophyte, known as one of the causative agents of dermatophytosis.

Objectives: The purpose of this study was to explore the genotypes of T. benhamiae strains isolated from geographically different areas of Iran and also to evaluate in vitro antifungal susceptibility profile of these strains against seven antifungal drugs.

Methods: Twenty-two strains of T. benhamiae and two strains of T. eriotrephon were isolated from patients with distinct types of dermatophytosis. DNA extraction and amplification of rDNA regions using ITS1 and ITS4 primers were conducted on the isolates. The in vitro antifungal susceptibility of posaconazole (PSC), voriconazole (VRC), itraconazole (ITC), ketoconazole (KET), caspofungin (CAS), terbinafine (TRB) and griseofulvin (GRZ) was evaluated according to CLSI M38-A2 protocol.

Results: The multiple alignment of the ITS-rDNA sequences of T. benhamiae indicated a mean similarity of 99.5%, with 0-3 interspecies nucleotide difference. The geometric mean (GM) values of minimum inhibitory concentrations (MICs) and minimum effective concentrations (MECs) across the all isolates were respectively: TRB: 0.025 mg/L, PSC: 0.032 mg/L, ITC: 0.050 mg/L and VRC: 0.059 mg/L with lower values and CAS: 0.31 mg/L, KTZ: 0.56 mg/L and GRZ: 0.76 mg/L with higher values.

Conclusion: Diverse ITS sequence types of T. benhamiae were shown in different geographical regions of Iran. The TRB, PSC and ITC were the most effective drugs against T. benhamiae strains, respectively. Furthermore, in our study, two strains of T. eriotrephon as a scarce dermatophyte species were described.

Keywords: Trichophyton benhamiae; Trichophyton eriotrephon; Dermatophytosis; Iran.