In vitro antifungal susceptibility profile of Trichophyton schoenleinii isolated from 55 tinea capitis favosa in Iran, China, and Turkey

Introduction

Trichophyton schoenleinii is an anthropophilic dermatophyte mainly causing tinea favosa of the scalp in certain regions of the world, especially Asia and Africa. Little is known on utility of the newer antifungal agents for the management of tinea capitis caused by T. schoenleinii from different geographical regions.

Methods

We investigated the in vitro susceptibilities of 55 clinical isolates of T. schoenleinii collected from Iran, China, and Turkey against 12 antifungal drugs by using the Clinical and Laboratory Standards Institute (CLSI) broth-microdilution method.

All isolates were cultured on Sabouraud glucose agar (Merck, Darmstadt, Germany) at 25 °C for 7 days. Morphological identifications were confirmed using sequence-based analysis of the rDNA Internal Transcribed Spacer (ITS) regions.

For obtaining the conidia used for susceptibility testing, the T. schoenleinii isolates were subcultured onto brain heart infusion agar medium supplemented with 5 mg/L thiamine and 0.5% glucose and maintained at 25 °C for 4 days or longer until good white fluffy colonies were achieved. Conidia were harvested to sterile saline and the suspension adjusted to 1-3 × 10³ conidia mL⁻¹ in RPMI-1640 buffered with MOPS (morpholinepropanesulfonic acid).

Key words:

Trichophyton schoenleinii, tinea capitis, antifungal susceptibility testing, Iran, Turkey, China

Results and Discussion

The geometric means of the minimum inhibitory/effective concentrations (MICs/MECs) of the antifungals against all isolates were the following (in increasing order): terbinafine (0.05mg/L), posaconazole (0.20 mg/L), amphotericin B (0.29mg/L), ketoconazole (0.52mg/L), miconazole (0.57mg/L), caspofungin (0.60 mg/L), anidulafungin (0.68mg/L), itraconazole (0.81 mg/L), voriconazole (0.89 mg/L), griseofulvin (0.92 mg/L), fluconazole (25 mg/L), and fluclotin > 64 mg/L. The MIC/MEC ranges across all isolates were as follows: terbinafine (0.02-013mg/L), posaconazole (0.03-0.5 mg/L), amphotericin B (0.03-0.5 mg/L), ketoconazole (0.13-1 mg/L), miconazole (0.13-1mg/L), caspofungin (0.25-1 mg/L), anidulafungin (0.02-8mg/L), itraconazole (0.06-4 mg/L), voriconazole (0.06-4 mg/L), griseofulvin (0.05-2 mg/L), fluconazole (4-64 mg/L), and fluclotin > 64 mg/L. No statistically significant differences in the susceptibility profiles of T. schoenleinii were detected within the geographical regions investigated.

Conclusions

• Our results revealed that terbinafine and ketoconazole were the most potent antifungals against T. schoenleinii among systemic and topical antifungals tested, respectively, independent of geographical regions isolated.

• These results might help clinicians in developing appropriate therapies that have a high probability of successfully treating tinea capitis favosa caused by T. schoenleinii.

Table 1. Geometric mean of MICs/MECs, MIC/MEC ranges, and MIC/MEC50 and MIC/MEC90 values obtained by testing the susceptibility of 55 Trichophyton schoenleinii strains to 12 antifungal agents.

<table>
<thead>
<tr>
<th>Strains number</th>
<th>AmB</th>
<th>Sfc</th>
<th>FIC</th>
<th>ITC</th>
<th>VRC</th>
<th>POS</th>
<th>MFG</th>
<th>RTZ</th>
<th>AFG</th>
<th>CAS</th>
<th>GRZ</th>
<th>TRB</th>
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<tbody>
<tr>
<td>range</td>
<td>0.03-0.5</td>
<td>64</td>
<td>4-64</td>
<td>0.06-4</td>
<td>0.06-4</td>
<td>0.03-0.5</td>
<td>0.13-1</td>
<td>0.13-1</td>
<td>0.02-8</td>
<td>0.25-1.00</td>
<td>0.05-2</td>
<td>0.02-0.13</td>
</tr>
<tr>
<td>MIC/MIC&lt;sub&gt;50&lt;/sub&gt;</td>
<td>0.25</td>
<td>64</td>
<td>16</td>
<td>0.25</td>
<td>0.38</td>
<td>0.13</td>
<td>0.50</td>
<td>0.02</td>
<td>0.5</td>
<td>0.75</td>
<td>0.03</td>
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</tr>
<tr>
<td>MIC/MIC&lt;sub&gt;90&lt;/sub&gt;</td>
<td>0.5</td>
<td>64</td>
<td>64</td>
<td>2</td>
<td>2.00</td>
<td>0.50</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>2.00</td>
<td>0.12</td>
<td></td>
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<tr>
<td>Geometric mean</td>
<td>0.29</td>
<td>64</td>
<td>0.00</td>
<td>25</td>
<td>0.81</td>
<td>0.89</td>
<td>0.20</td>
<td>0.57</td>
<td>0.52</td>
<td>0.68</td>
<td>0.60</td>
<td>0.92</td>
</tr>
</tbody>
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