Clinical Aspergillus isolates causing aspergillosis in the last 20 years: an overview of aetiology and antifungal resistance to azoles and amphotericin B

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INTRODUCTION AND PURPOSE

There is a plethora of reports alerting on the rise in the number of azole-resistant Aspergillus spp isolates in different European countries. In contrast, data from Southern Europe is scarce.

The Clinical Microbiology and Infectious Diseases Department of Gregorio Marañón Hospital, a large tertiary hospital located in Madrid, Spain, acts as a watchtower of invasive fungal infections in the hospital where all patients with Aspergillus infection are followed up.

We here report the identification and antifungal susceptibility to amphotericin B, itraconazole, voriconazole, posaconazole, and isavuconazole of a collection of clinically significant Aspergillus spp isolates from patients cared at our hospital in the last two decades.

RESULTS

• The aetiology of agents causing invasive aspergillosis is shown in Figure 1:

![Figure 1](image1.png)

- The vast majority of patients were infected by A. fumigatus sensu stricto and the number of patients infected by cryptic species was variable and erratic (Figure 3).

![Figure 2](image2.png)

- The percentage of resistance to amphotericin B and azoles was 4.5% and 2.4%, respectively.

- In non-Fumigati sections, azole resistance was found in Terrei (2/32), A. terreus sensu stricto, n=2; A. citrinotherses, n=1 and Nidulantes (3/8; Emericella nidulans).

- Isolates of Fumigati section showed the highest rate of antifungal resistance with the cryptic species as the ones mostly affected (Table 1).

![Figure 3](image3.png)

<table>
<thead>
<tr>
<th>Year</th>
<th>Diagnosis</th>
<th>MIC (mg/L)</th>
<th>cyp51A gene</th>
<th>Risk factors (clinical form)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AmB</td>
<td>ITC</td>
<td>VOR</td>
</tr>
<tr>
<td>2011</td>
<td>Proven</td>
<td>0.5</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>2012</td>
<td>Probable</td>
<td>0.25</td>
<td>16</td>
<td>4</td>
</tr>
</tbody>
</table>

CONCLUSION

• A. fumigatus complex represented around 70% of the isolates causing invasive aspergillosis at our center.

• The rate of resistance to azoles and amphotericin B in A. fumigatus sensu stricto was lower than 1%, highly impacted by the presence of cryptic species, and has not shown any sign of increase over the years.