Cross-resistance to clinical and agricultural azoles among Aspergillus fumigatus isolates selected from humans and environment in Italy

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Background: In Italy, a prevalence of 16.9% of resistance to clinical azoles was observed among Aspergillus fumigatus isolates selected from an environmental source. This trend ofazole resistance is attributed to the widespread use of 14α-sterol demethylase inhibitors (DMIs).

Objective: To investigate the DMI resistance rate in clinical and environmental A. fumigatus isolates from Italy. Methods: AZA, ITZ, and ERZ MICs were determined using the Etest method. Results: 64 A. fumigatus strains were selected: 23 susceptible to clinical azoles (CAS) and 31 resistant (CAR) with and without mutations in the CYP51A1 gene (TRKAF98, E219L, G48L, G48I, D54Y, M22H, or F44Y/M48I/Y51F/E521F/E742K). A more pronounced resistance to DMI was observed in CAS compared to CAR strains. A significant difference in geometric means (GM) of ITZ and ERZ was observed between CAR and CAS strains. Conclusions: The prevalence of DMI resistance is increasing in clinical and environmental isolates. Azole resistance is associated with drug exposure. These findings support the need for alternative therapeutic strategies and the importance of monitoring azole resistance in clinical and environmental isolates.