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High prevalence of clinical and environmental triazole-resistant *Aspergillus fumigatus* in Iran: Is it a challenging issue?

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Triazole antifungal agents are the mainstay of aspergillosis treatment. As highlighted in numerous studies, the global increase in the prevalence of triazole resistance could hamper the management of aspergillosis. In the present three-year study, 513 samples (213 clinical and 300 environmental samples) from 10 provinces of Iran were processed and screened in terms of azole resistance (4 and 1 mg of itraconazole and voriconazole, respectively), using selective plates. Overall, 150 *A. fumigatus* isolates (71 clinical and 79 environmental isolates) were detected. The isolates were confirmed by partial sequencing of the b-tubulin gene. Afterwards, *in vitro* antifungal susceptibility tests against triazole agents were performed based on the Clinical and Laboratory Standards Institute (CLSI) M38-A2 document. The *CYP51A* gene was sequenced in order to detect mutations. The MIC of itraconazole against 10 (6.6 %) strains, including clinical (n=3, 4.2%) and environmental (n=7, 8.8%) strains, was higher than the breakpoint and epidemiological cut-off value. Based on the findings, the prevalence of azole resistant *A. fumigatus* in Iran has increased remarkably from 3.3% to 6.6% in comparison with earlier epidemiological research. Among resistant isolates, TR34/L98H mutations in the *CYP51A* gene were the most prevalent (n=8, 80%), whereas other point mutations (F46Y, G54W, Y121F, G138C, M172V, F219C, M220I, D255E, T289F, G432C and G448S mutations) were not detected. Although the number of patients affected by azole-resistant *A. fumigatus* isolates was limited, strict supervision of clinical azole-resistant *A. fumigatus* isolates and persistent environmental screening of azole resistance are vital to the development of approaches for the management of azole resistance in human pathogenic fungi.

Biography

Hamid Badali has completed his PhD from Amsterdam University, Fungal Biodiversity Center, Utrech, Netherlands and Postdoctoral studies from the Department of Medical Microbiology and Infectious Diseases, Canisius-Wilhelmina Hospital, Nijmegen, Netherlands. He is the Secretary of Iranian Society of Medical Mycology. He has published more than 65 papers in reputed journals and has been serving as an Editorial Board Member.

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