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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.

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A qualitative and quantitative study of fungal flora in the environment of high-risk services at the CHU Annaba, Algeria

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Introduction: Fungal infections are a preoccupation becoming more significant in the services in charge of risk patients particularly those invasive. The risk of developing invasive fungal infections depends on the level of patient exposure to sources of fungal spores and their immune status. These infections remain dreadful diseases and their support raises many diagnostic and therapeutic problems.

Aim: The purpose of this study is to know the aero fungal flora at high risk services of CHU of Annaba, Medical Intensive Care Unit, large burned Onco-Hematology, Nephrology-Hemodialysis and Internal Medicine.

Materials & Methods: 11 surveys were carried out in the services concerned. The applied methods are the sedimentation of airborne spores on agar, swabbing surfaces and the impact on medium in the petri dish with a bio-collector (air sampler). The cultures obtained on Sabouraud medium are identified by filamentation test and Achlamy sporulation test for yeasts and by macroscopic and microscopic examination for filamentous colonies. A transfer into other identification media was realized when necessary (Czapek media, media with extract Malt).

Results: Among the isolated yeast-like fungi: The genus *Rhodotorula* sp., is the predominant type (57%) followed by *Candida albicans* (27%), of non-albicans *Candida* species (13%) and *Cryptococcus* sp. (3%). For filamentous fungi, the genus *Aspergillus* sp., represents 27% of the isolated strains, followed by the genus *Cladosporium* sp. (21%), *Penicillium* sp. (13%), *Alternaria* sp. and *Mucor* sp. (11%), *Paecilomyces* sp. (9%), *Fusarium* sp. (7%), *Scytalidium* sp. (5%) and *Aureobasidium* sp. (3%).

Conclusion: Regular surveillance of aerobiocontamination of hospital services allow to assess the impact of environmental risk and evaluate potentially pathogenic fungal species, as well as tracking changes in the species in order to ensure appropriate protection and proper care for invasive fungal infections including invasive aspergillosis.

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