Predominance of non-*fumigatus* *Aspergillus* species among patients suspected to pulmonary aspergillosis in a tropical and subtropical region

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Background: The rate of infections caused by *Aspergillus* in patients with immune deficiency has increased during the past decade. Pulmonary aspergillosis (PA) is one of the main causes of mortality in such patients. Non-*fumigatus* *Aspergillus* species are the leading cause of PA in countries located in tropical and subtropical climate zones. Bronchoalveolar lavage (BAL) specimen is one of the useful specimens for diagnosis of PA. In this study, *Aspergillus* isolated from BAL specimens of patients with suspected PA were identified by a molecular method.

Material & Methods: In a prospective study between 2015 and 2016, a total of 150 BAL specimens was collected from patients with pulmonary disorders and underlying immunodeficiencies in Northeastern Iran in the Middle East. The originating *Aspergillus* strains were phylogenetically identified at the species level by analyzing partial β -tubulin gene sequences.

Results: Of the patients, 18 (12%) had a probable IPA with 13 (8.7%) positive direct examination and 20 (13.3%) positive culture for *Aspergillus*. Overall, *Aspergillus* species were isolated from 10 (50%) patients with cancer, 5 (25%) patients receiving corticosteroid therapy, 3 (15%) organ transplant recipients and 2 (10%) patients admitted to intensive care unit (ICU). *A. flavus* complex was the predominant 15 (75%) cause of probable invasive pulmonary aspergillosis (IPA), followed by *A. tubingensis* 3 (15%), and 2 (10%) *A. fumigates* complex.

Conclusion: The distribution of *Aspergillus* species in patients with PA in the tropical region of northeastern Iran in the Middle East shows a predominance of the more non-*fumigatus* *Aspergillus* spp. In addition, the cancer patients, particularly with hematological malignancies showed a relatively high incidence of IPA.

Refference:

1- Zarrinfar H, Mirhendi H, Makimura K, Satoh K, Khodadadi H, Paknejad O. Use of mycological, nested PCR, and real-time PCR methods on BAL fluids for detection of *Aspergillus fumigatus* and *A. flavus* in solid organ transplant recipients. *Mycopathologia*. 2013;176:377-85.

2- Zarrinfar H, Mirhendi H, Fata A, Khodadadi H, Kordbacheh P. Detection of *Aspergillus flavus* and *A. fumigatus* in bronchoalveolar lavage specimens of hematopoietic stem cell transplants and hematological malignancies patients by real-time polymerase chain reaction, nested PCR and mycological assays. *Jundishapur Journal of Microbiology*. 2015;8.

Characteristic	Immunosuppressive condition	No. of BAL specimens	Male/female ratio	Mean age (range)	Age range	No. of probable IPA
Sub-categories of immunocompromised hosts	Lung cancer	41	27/14	64.7	35-89	2
	Corticosteroid recipients	32	17/15	55.3	20-89	4
	Hematological malignancies	30	18/12	52.2	1-82	8
	Renal transplantation	12	7/5	47.8	26-69	3
	HTLV-1/HIV-infected patients	4	3/1	56.7	46-65	0
Patients admitted to ICU	Unknown	31	19/12	52.32	17-80	0

Table 1 : Demographics of enrolled patients suspected to IPA along with the immune status of patients

Figure 1: Sequencing results of *Aspergillus* isolates