

# Isolation of fungi from patients with pulmonary system disorder

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## الخلاصة

جمعت عينات القشع Sputum من ٢١٠ مريض يعانون من اضطرابات في عمل الجهاز التنفسي لغرض عزل الفطريات المتوقع إن يكون لها دور في حدوث هذه الأعراض. وقد شخّصت خمسة أنواع فطرية بعد زراعة القشع على وسط SDA وهي:-

*Candida albicans* , *Aspergillus niger* , *Aspergillus fumigatus* , *Geotrichum candidum* and *Mucor sp.*

ووجد بان الفطر *C.albicans* ( ٤٥,٧١ % ) ذو نسبة عالية مقارنة مع بقية الأنواع ، ويأتي بعدها الفطر *Aspergillus niger* ( ٩,٥٢ % ) والفطر *Aspergillus fumigatus* ( ٨,٥٧ % ) خصوصا عند الرجال مقارنة مع النساء مع ظهور نسبة ٣٣,٨ % من عدم النمو الفطري على الوسط الزراعي .

كما وجد بان قشع المرضى المدخنين والمتناولين المضادات الحيوية ذوي نسبة عالية من الأنواع *C.albicans* & *Aspergillus sp.* مع عدم ظهور نمو للفطر *Geotrichum candidum* في قشع أي من الحالتين .

## Abstract

Sputum from 210 patients suffering from pulmonary system disorder were culturing on SDA, in order to isolation fungi species which may be have a role in this cases.

Five species of fungi were diagnostic : *Candida albicans* , *Aspergillus niger* , *Aspergillus fumigatus* , *Geotrichum candidum* and *Mucor sp.* *C.albicans* was showed a high percents No. (45.71 %) follow by *A.niger* (9.52 %) and *A. fumigatus* (8.57 %), especially in males than females with 33.80 % of negative growth.

Smoking and antibiotic therapy were also recorded from all patients and *C.albicans* with *Aspergillus* species have also been a high rats of isolate from these patients, whereas, *Geotrichum candidum* was not isolated from neither smoking patients nor patients under antibiotic therapy.

## Introduction

Individual was inhalation a great amount of fungi spores and mycelium fragments every day during their ordinary air inspiration and most of these types of fungi are non pathogenic in the normal condition of the body, but any defect in immunity system (immunosuppressant drugs) (1, 2) or though organ transplantation (mainly solid organ transplantation) (3, 4, 5), will be encourage these fungi to be pathogenic especially in respiratory system or other organs.

Seventy two case from 850 inpatients at one of large teaching hospital in England were diagnosed as Aspergillosis , 18 ( 25 % ) of them had nosocomial signs and 17 ( 23.6 % ) had prior solid organ transplantation (6) mainly liver and lung transplant patients who are at the highest risk of developing invasive Aspergillosis (5) .

Pulmonary disease by Zygomycetes fungi were also found to be represented 30 % of 20 patients with Zygomycosis (7).

## Materials and Methods

Two hundred and ten patients (210) severing from pulmonary system disorder were selected to take sputum samples during entering in Morjan hospital at Hilla city.

Sputum was collected in a sterile cup in order to examine directly under the microscope for spores or fungal mycelium and differentiated from Tuberculosis infection after acid fast stain performing and, in the same time, sputum was culturing on a slants of Sabourouds dextrose agar (Oxford, England) which are incubated at 25 – 28 ° c for 1 – 7 days.

Fungi species were diagnosed according to Kwon-Chung (8) and Rippon (9).

## Results

Five species of fungi were diagnosed after sputum culturing , *Candida albicans* , *Aspergillus niger* , *Aspergillus fumigatus*, *Geotrichum candidum* and *Mucor sp.* , whereas , negative results was also noted ( 33.8 % ). *C. albicans* was showed a high rat of growth (45.71 %) following by *A. niger* ( 9.52 % ) , *A. fumigatus* ( 8.57 % ) , while *Geotrichum candidum* and *Mucor sp.* had been a low percent of occurring ( Table 1 ). Sputum of smoking and patients under antibiotic therapy were containing *C. albicans* (35.71 % , 18.57 % respectively) and *A. fumigatus* ( 4.76 % , 2.85 % respectively ) , whereas , *G. candidum* was not occured in all patients under these condition ( Table 2 ) .

## Discussion

The soil is a common source of respiratory system fungi when these organisms are saprophytic on the organic matter and becomes opportunistic to cause different human diseases.

*Candida albicans* occurs among the normal microbial flora in the mouth and gastrointestinal region (8) and reported to cause a systemic mycoses in the body (9).

Aspergillosis comprises a group of world human diseases caused by about a dozen fungal species of the genus *Aspergillus* and *A. fumigatus* is the virulence one principally in individuals who have predisposing abnormalities disease such as Tuberculosis or who are systemically immunosuppressed (3) and this condition are being true for other opportunistic fungi as *Geotrichum* and *Mucor*. Invasive Aspergillosis by *A. fumigatus* (IA) has become already cause of death, mainly among bone marrow transplantation or solid organ recipients, but also among AIDS patients (4) and *Aspergillus* has a significant potential to act as a powerful allergen resulting in *Aspergillus* asthma and allergic bronchopulmonary aspergillosis (3,10).

Mucormycosis result from infection by one of the mucorales order is a rare opportunistic infection that complicates chronic debilitating diseases (11) and prognosis in patients is poor, resembling infection with *Aspergillus* (12). Immunosuppressant drugs as corticosteroids were play important roles to make fungi infection more invasive (3) when from a total of 24 patients with invasive pulmonary Aspergillosis (IPA), 17 patients who had recent intensive immunosuppressive therapy (2) and IPA causes of acute respiratory failure in patients with chronic obstructive pulmonary disease (COPD) (13).

*C. albicans* and *Geotrichum candidum* were isolation from 42 Haematological malignancy patients (14).

A high degree of awareness and efforts for an early diagnosis may participate to improve the poor prognosis (5).

Antibiotic therapy for along time will be lowering of competition between fungi and normal flora (9) and smoking has also enhancement of fungi infection by weakness of pulmonary system immunity.

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Table (1): Fungi species isolation from pulmonary system disorder patients.

Fungi species	Sex		Total No.
	Males	Females	
<i>C. albicans</i>	63 (28.5 %)	33 (15.7 %)	96 (45.71 %)
<i>A. niger</i>	12 (5.71 %)	8 (3.80 %)	20 (9.52 %)
<i>A. fumigatus</i>	7 (3.33 %)	11 (5.23 %)	18 (8.57 %)
<i>G. candidum</i>	2 (0.95 %)	zero	2 (0.95 %)
<i>Mucor sp.</i>	1 (0.47 %)	2 (0.95 %)	3 (1.42 %)
Negative	45 (21.4 %)	26 (12.3 %)	71 (33.80 %)
Total No.	130	80	210

Table (2): Fungi species isolation from smoking and under antibiotic therapy patients.

Fungus species	smoking	Antibiotic therapy
<i>C. albicans</i>	75 (35.71 %)	39 (18.57 %)
<i>A. niger</i>	7 (3.33 %)	3 (1.42 %)
<i>A. fumigatus</i>	10 (4.76 %)	6 (2.85 %)
<i>G. candidum</i>	zero	zero
<i>Mucor sp.</i>	1 (0.47 %)	2 (0.95 %)
Negative	50 (23.80 %)	23 (10.95 %)
Total No.	143	73