

## FUNGI FREQUENCY OF CANDIDA GENUS AT THE PULMONARY PATENTS, THEIR IDENTIFICATION AND CHARACTERISATION

DH. TORBA<sup>1</sup>, M. LIKA (ÇEKANI)<sup>2\*</sup>, F. SINANI<sup>3</sup>.

<sup>1</sup>Institute of Public Health “Hulo Hajdëri” Tirana

<sup>2</sup> Department of Biology, Faculty of Natural Sciences, Tirana University

<sup>3</sup> Universitary Hospital of Lung Diseases “Shefqet Ndroqi” Tirana

\* Author of correspondence; Email: mirela2422@yahoo.com

### Abstract

Pneumonia is an inflammation or infection of the lungs most commonly caused by bacteria or viruses, but it can also result from opportunistic fungi. Pneumonia occurs when the air sacs and the small airways in the lungs fill with liquid and therefore they cannot function properly. When gas exchange is impeded, the body cannot take in oxygen as it normally would. Oxygen is vital for the body's cells and it is needed for the aerobic respiration; the breakdown of glucose for obtaining energy for the cellular metabolism. Following morphological and biochemical investigations performed in 94 isolated strains, 53 % were identified as *Candida albican* and 18 % strains as *Candida tropicalis*. In cases where antibiotics or other drug treatments have been applied, the frequency and the trend to chronicle development of the *Candida* increases. The incidence of *Candida* is primarily related to the endocrine status.

**Key words:** *Candida* fungi, infection, isolated strains, drug treatments

### 1. Introduction

*Candida* infection is caused by *Candida* fungi gender, among which the most common is *Candida albicans* (80-90%). Some of the other fungi but less pathogenic that cause infections are: *C. tropikalis*, *C. pseudotropikalis*, *C. guillermondi*, *C. krusei*, *C. pseudokrusei*, *C. stellatoidea*, *C. zylanoides*.

These fungi are capable of causing *Candida* infections only at specific conditions of the organism and in particular during predisposing situations like: diabetes, pregnancy, use of antibiotics, cortisones, contraceptives, estrogens, immunosuppressors, methronidazol, genetic factors, etc. *Candida* Infections in the last 10 years have increased due to the conditions which favor their multiplication. *C. albicans* fungi are a digestive mucous saprophyte that becomes pathogenic when they find favorable conditions in the host body. *Candida albicans* is isolated in the mouth, sputum, vaginal secretions, urine, skin and feces. Infections caused from *Candida* usually take place mainly in the lining of the mouth and the digestive tract. It begins with redness of the tongue and the entire cavity of the mouth with some certain white islands which tend to grow as a result of some mechanisms that can cause the mucosa ulcerates. [3, 5, 6, 13].

The patients have the feeling of acerbity and drought as well as pain when eating solid food.

Mycoses are implications of the lung tuberculosis patients, treated during the chronic broncho-pneumonopati with antibiotics. Usage of antibiotics with a great spectrum of action (ampychilin family, cephalosporine, aminoazide, tetracycline, chloramphenicol), usage of corticoides and immunodepressors leads to an imbalance of intestinal micro indoor favoring invasion of the candidate [5, 8, 10, 12].

Lungs are often affected by the opportunistic *Aspergillum fungus*. Cases with *aspergillum* pulmonary have increased immensely after anti-tubercular anti-biotherapy. *Candida* infections are not contagious.

### 2. Materials and Methods

Our survey which was based on mycological examinations, involved 857 lung infected patients presented at the Lung Diseases Hospital, Tirana during 2008. From the examined cultures of pathological materials (taken from the sputum of these patients, or from bronchial wash) 94 cases resulted positive for the candidate.

The mycological examinations of the secretions were performed through direct microscopic examinations with KOH 5 %, growth in Sabouraud-

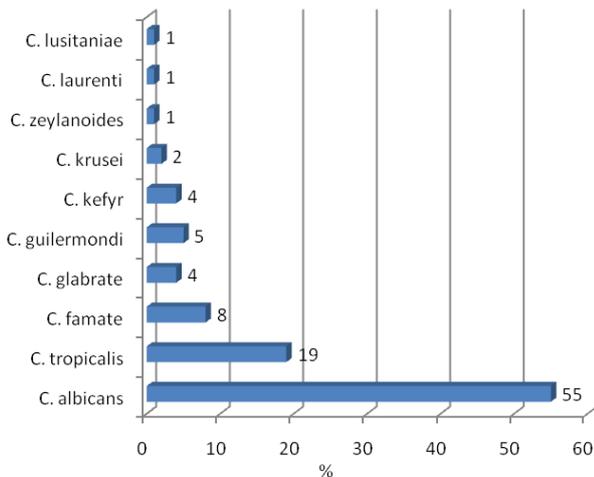
Chloramphenicol-Actidion media and yeast's differentiation was made through biochemical computerized methods API 20.

Colonies formed were: round, white, crème, attached behind the terrain and smelled as the leaven of beer with size 2-4 mm. Mycoses induced were considered those cases whose vaginal pH was lower than 4, 5.

Following direct microscopic examinations of the secretions, pseudomyceles and mycelia filaments were identified while multiple colonies of genus *Candida* fungi were isolated following growth in appropriate media [4, 9, 11, 14].

### 3. Results and discussion

Considering 94 patients positive for the *Candida*, 55 cases came up positive with *Candida albicans*, 19 *Candida tropicalis*, 8 cases *Candida famate*, *Candida glabrata* 4 cases, 5 cases *Candida guilermonti*, *Candida kefy* 4 cases, 2 cases of *Candida krusei*, 1 case *Candida zeylanoides*, 1 case *Cryptococcus laurenti*, 1 case of *Candida lusitaniae*.



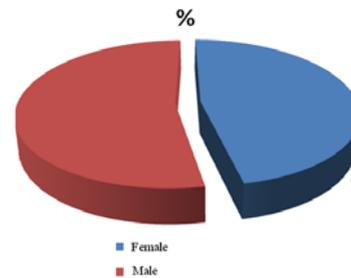
**Figure 1:** The frequency of *Candida* species in the positive cases



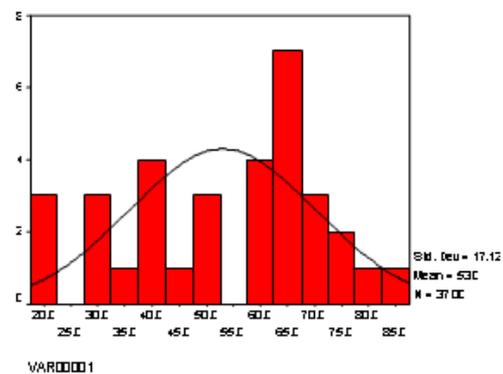
**Figure 2.** *Candida* colonies

The infection is identified if the number of the colonies is more than 10 colonies.

Female-male ratio was 44 to 50 (Figure 3). The average age of patients which we got in our study was 58 years old, ranging from 20 to 80 years (Figure4).



**Figure 3:** Female male ratio in positive cases



**Figure 4:** The age of patients in the study

The average age of patients was 58 years ranging from 20 to 80 years

Prophylactic measurements aimed to eliminate the favorable conditions for the candida development and growth mainly to stop the resistance of the organism. For this reason, a diet rich in proteins and poor in carbohydrates is recommended. At the same time a long time treatment with antimycotic preparations, with antibiotics and immune depressor cortisone is recommended for the lung infections.

Treatments of *Candida* cases were done using preparations of the imidasol group. Ketokonazol is the most useful preparation in *Candida* and it is given in a dose of 100-800 mg/ day for 7-10 days. While in the patients with pulmonary *Candida*, B amphotericyn is given as an intravenous preparation.

During the period of the survey, the identified mycosis infections reached 11 % of the total. Our data indicate a high frequency of the pulmonary infections caused by the genus *Candida* fungi. By our studies results that the incidence of the pulmonary mycosis infections is 94 cases from 857 presented in the hospital.

Following morphological and biochemical investigations performed in 94 isolated strains, 53 % were identified as *Candida albican*, 18 % strains as *Candida tropicalis* and the others (*C. guilermonti*, *C. kefyr*, *C. krusei*, *C. zeylanoides*, *C. laurenti*, *C. lusitaniae*, *C. famate*, *C. glabrate*). From the above indicated data- it can be assumed that *Candida albicans* and *Candida tropicalis* are the principal agents responsible of the *Candida* in the pulmonary patents [2, 4, 9].

Among the "physiological" factors that induce the development of a *Candida*, the usage of the antibiotic should be considered as a major factor in the pathogenicity of the infection. During this period, an increase of glycogen is made into the cells of the epithelium layer, which will be converted from *B. lacticus* into lactic acid thus sensibly decreasing the vaginal pH. The acid pH will cause the inhibition of antagonistic bacteria but will stimulate the growth of *Candida* fungi.

In cases where antibiotics or other drug treatments have been applied, then the frequency and the trend to chronicle development of the *Candida* will increase. The incidence of *Candida* is primarily related to the endocrine status.

Generally, the treatment of mycosis is based on applications of anti-mycosis preparations for 7-10 days, in particular the imidasole group of drugs [1, 7, 12].

#### 4. Conclusions

*Candida* caused by fungi of the candidate genus is usually a complication that often occurs in pulmonary patents.

The most common cause of it is *Candida albicans*. Therefore, in these illnesses necessary preparations like anti mycosis and treatments with antibiotics are used.

#### 5. References

1. Bodey GP: **Azole antifungal agents.** *Clin. Infect. Dis.* 1992, **14**:S161-S169.
2. Brawner DL, Anderson GL, Yuen KY: **Serotype prevalence of *Candida albicans* from blood culture isolates.** *Clin. Microbiol.* 1992, **30**:149-153.
3. Calderone RA, PC Braun: **Adherence and receptor relationship of *Candida albicans*.** *Microbiol. Rev.* 1991, **55**:1-20.
4. Cooper A: **Manual of basic laboratory methods.** USAID 1999.
5. Dako A, Lika (Çekani) M, Torba Dh: **Studimi dhe percaktimi i kerpudhes *Candida albicans* tek femrat shtatzena dhe femijet e porsalindur.** *Buletini Matematika dhe Shkencat e Natyres* 2006, **2** :23-30.
6. Hamzaraj E: **Mikrobiologji.** *Kërpudhat* 2007, 236-239.
7. Lika M: **Eksperimente ne Fiziologjine dhe endokrinologjine e riprodhimit.** 2004, 43.
8. Lika (Çekani) M, Vila B, Torba Dh: **Shkaqet dhe shkaktarët e mykozave në femrat shtatzëna dhe jo shtatzëna të Tiranës.** *Studime Biologjike* 2003, **7**:68-76.
9. Lika (Çekani) M, Torba Dh, Papajorgji M, Dako A: **The survey on the genital mycoses at the obstetric-gynecology clinics of Tirana;** *AJNTS, Albanian Journal of Natural & Technical Sciences*, 2006, **11**(1-2), 115-121.
10. Papajorgji M: **Sexual transmitted disease.** 2001.
11. Papajorgji M, Lika M: **The study of syphilis by immunological methods.** *Albanian Journal of Natural & Technical Sciences*, 2002, **7**(12), 3-7.
12. Rinaldi MG: **Biology and pathogenicity of *Candida* species.** In: *GP Bodey (ed), Candidiasis: Pathogenesis, Diagnosis and Treatment.* Ravan Press, New York 1996, 1-20.
13. Soll DR: **High frequency switching in *Candida albicans*.** *Clin. Microbiol. Rev.* 1995, **5**:183-203.
14. Ajello L, Hay R, Topley WW, Wilson SG: **Topley and Wilson's Microbiology and Microbial Infections: Medical Mycology:** Arnold; 1998.
15. Torba Dh: **Biological Studies. The study of some frequently infections at women.** 2005, **10**: 105-111.
16. Wickes BL, Hicks JB, Merz WG, Kwon-Chung KJ: **The molecular analysis of synonymy among medically important yeasts within the genus *Candida*.** *Gen. Microbiol.* 1992, **138**: 901-907.
17. WHO: **Managment of sexually transmitted diseases.** Geneva 1996.