



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

International Journal of Current Research
Vol. 11, Issue, 02, pp.1183-1184, February, 2019

DOI: <https://doi.org/10.24941/ijcr.34440.02.2019>

RESEARCH ARTICLE

PREVALENCE OF FUNGAL ISOLATES IN DIFFERENT CATEGORY OF PULMONARY TUBERCULOSIS PATIENT

*Dr. Tintith Ansari, Dr. Mahendra Nagar, Dr. Suman Khangarot, Dr. Anil Saxena and
Dr. Kamalnayan Shringi

Department of Respiratory Medicine, Government Medical College, Kota

ARTICLE INFO

Article History:

Received xxxx, 2018

Received in revised form

xxxx, 2018

Accepted xxxx, 2018

Published online xxxx, 2019

Key Words:

Pulmonary TB, Fungal infection,
MOR TB.

ABSTRACT

Introduction: Pulmonary tuberculosis is a chronic destructive lung disease with caseation, necrosis and fibrosis that lead to the formation of cavities. These cavities facilitate the growth of many organisms including fungi by providing plenty of oxygen and necrotic tissue material. **Material and Methods:** A cross sectional study conducted in the department of respiratory medicine, govt medical college, kota. 200 sputum samples were taken and divided into 4 groups of 50 cases each. **Results:** Fungal co-infections were more common in male sex, malnourished, smoker and alcoholic. Overall fungal prevalence was 36 % with Moulds in 21.5% and filamentous fungi in 14.5%. **Conclusion:** A high prevalence of fungal infection is found among TB patients and a routine screening for fungal infection is recommended for proper diagnosis and early management.

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Citation: Dr. Tintith Ansari, Dr. Mahendra Nagar, Dr. Suman Khangarot, Dr. Anil Saxena and Dr. Kamalnayan Shringi. 2019. "Prevalence of fungal isolates in different category of pulmonary tuberculosis patient", *International Journal of Current Research*, 11, (02), 1183-1184.

INTRODUCTION

Pulmonary tuberculosis is a contagious bacterial infection caused by *Mycobacterium tuberculosis*. It ranks as the second leading cause of death due to an infectious disease worldwide next to Human Immunodeficiency Virus (WHO, 2014). Pulmonary tuberculosis, is a chronic destructive lung disease which forms cavities, facilitate the growth of many organisms including fungi by providing plenty of oxygen and necrotic tissue material (Khanna, 1977). *Candida* species are also emerging as potentially pathogenic fungal agent in patients with broncho-pulmonary disease³ Fungal co infection which doesn't respond to antibiotics which could be fatal and often mistaken for recurrence of tuberculosis. In this study we tried to find out the prevalence of fungal infections and their species among pulmonary tuberculosis patients and to compare with normal population.

MATERIAL AND METHODS

This was a cross sectional study conducted in the department of respiratory medicine, New Medical College and Hospital, Kota over a period of one year. Total 200 cases was taken and divided into four groups with 50 cases each. In Group 1 healthy cases, in Group 2 sputum positive cases of *M. tuberculosis* in Group 3 MDR tuberculosis cases and in Group 4 old treated pulmonary TB were taken. Thorough history, physical examination and investigations were done.

*Corresponding author: Dr. Tintith Ansari

Department of Respiratory Medicine, Government Medical College, Kota.

Fungus was identified by sputum KOH Mount and Fungal culture on Sabouraud's dextrose agar (SDA) slants with chloramphenicol.

RESULTS

Fungal co-infections were more common in male sex, malnourished, smoker and alcoholic. Prevalence of fungal infection was 12%, 36%, 52% and 44% in group 1, 2, 3, and 4 respectively. Overall fungal prevalence was 36 % with Moulds in 21.5% and filamentous fungi in 14.5%. In moulds *Candida albicans* was most common species (33.3%) Other species were *C. tropicalis* (11%), *C. glabrata* (9.7%) and *Trichospora* (5.5%). In filamentous fungi *Aspergillus fumigatus* was most common (13.8%) followed by *A. niger* (11.1%) *A. flavus* (8.3%) *Rhizopus* (2.7%) and *Penicillium* (4.1%) Fungus culture positivity was significantly less in normal cases (group 1) when compared with group 2, group 3 and group 4 ($p < 0.05$).

DISCUSSION

In the present study, fungi were isolated in 36% in pulmonary TB (new and retreatment) and 52% of samples in MDR which correlates with Jain *et al*⁴ who reported 53%, Yadu *et al.* (2015), 49%. In our study, about 36% of pulmonary tuberculosis patients were co-infected with fungal agents which was also in concordance with the study conducted by Khanna *et al.* (1977) and Bansal *et al.* (1977) where 36.36 % and 39.4% of pulmonary tuberculosis patients were coinfecting with fungal agents.

Showing p value of different groups

Groups	Positive	Negative	P value
Group-1	6	44	0.0049
Group-2	18	32	
Group-3	26	24	<0.001
Group-4	22	28	<0.001

Prevalance of fungal infection in different groups

Fungal species	Group1	Group2	Group 3	Group4	Total
	N=50	N=50	N=50	N=50	N=200
Candida albicans	6	7	6	5	24
Candida Tropicalis	0	2	3	3	8
Candida Glabrata	0	1	3	3	7
Tricospora	0	1	2	1	4
Aspergillus Fumigatus	0	4	2	4	10
Aspergillus Niger	0	1	5	2	8
AspergillusFlavus	0	2	2	2	6
Rhizopus	0	0	1	1	2
Penicillium	0	0	2	1	3
TOTAL	6	18	26	22	72

Though several authors have documented *Candida* species as the most common fungal agent isolated from sputum of pulmonary tuberculosis patients, its significance has always been a matter of controversy due to the fact that up to 32.5% healthy people carry *Candida* in their throat. In our study we found 12% of candida infection in healthy people. This can contaminate the sputum sample during collection (Santiwongkarn, 2012). To eliminate this problem different approaches have been used. Bronchoscopy samples have lesser chance of becoming contaminated with upper respiratory flora and are preferred to sputum (El-Ebiary, 1997). Yet in developing countries such as India bronchoscopy is not always feasible or practical (Latha, 2011). In the present study we detected 63.6%, 18.1%, and 18.1% prevalence of *C. albicans*, *C. tropicalis*, *C. glabrata*, respectively. This result is in keeping with other similar studies. Baradkar et al. (2009) detected *C. tropicalis* 3.25%, Latha et al. documented *Candida tropicalis* (19.95%), *Candida glabrata* (16.54%) These variations in percentages are mainly attributed to differences in local prevalence of different species due to different environmental conditions, as well as to the various detection methods employed. *Aspergillus* species was isolated from 14% of cases in our study. Our finding is in accordance with the study conducted by Khanna et al where *Aspergillus* species was isolated from 10% and also with Anna N. Njula et al (Njunda Anna, 2012), in which the isolation rate of *Aspergillus* species was 15%.

Conclusion

Finally, from our study we conclude that there was significant co-infection of fungal with *Mycobacterium tuberculosis*. It is possible that the high relapse cases, treatment failures, resistance and high mortality associated with TB infection is partly attributed to co-infection with opportunistic fungal pathogens. MDR-TB patients carry the risk of higher percentage of fungal infections; identification to the species level becomes mandatory in selecting the appropriate antifungal agents. As there is a high prevalence of fungal infection in TB patients, routine screening for fungal infection is recommended for proper diagnosis and early management.

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