Candida in Pulmonary Tuberculosis

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Abstract
In recent years, fungal infections are on the rise, due to various predisposing factors, such as patients on steroids, long term administration of antibiotics, HIV infection and many of them have basic pulmonary diseases like tuberculosis, which may also alter the course of the disease. Hence this study was undertaken to find out the prevalence of Candida species in cases of pulmonary tuberculosis. One hundred diagnosed cases of pulmonary tuberculosis were included in the study, from August 2006 – August 2007. Sputum samples were processed by KOH 10% preparation, Gram’s staining, Nigrosin (10%) staining, and were cultured on Sabouraud’s Dextrose agar (SDA) slants. The Candida species were isolated and diagnosed by standard mycological procedures. Out of the 100 cases studied, significant growth of Candida species was present in 26 cases (26%), the commonest isolates were Candida albicans (24%), followed by Candida tropicalis and Candida parapsilosis in one case each.

Introduction
In the recent years, there is a continuous growing interest for the diagnosis of mycoses. Most of the individuals affected with mycoses have a history of receiving antibiotics and/ or corticosteroids, other immunodeficiency like AIDS and majority of them have severe pulmonary diseases like tuberculosis. When host resistance is lowered, these unrecognized opportunistic fungi may affect the progress of disease or may even become fatal. Hence, there is need to consider the possible importance of these saprophytic organisms, when they are found repeatedly and evidently from the sites of infection. The present study was therefore undertaken to find out the prevalence of Candida species in pulmonary tuberculosis.

Material and Methods
100 diagnosed cases of pulmonary tuberculosis, with clinical presentation of tuberculosis and positive by Ziehl Neelsen smear for acid fast bacilli, were randomly selected. The study was conducted in the Department of Microbiology, L.T.M.M.C and L.T.M.G.H, Sion from August 2006-August 2007.

Early morning sputum sample was collected in a sterile container. Direct smear examination of sputum was done by 10% KOH, 10% Nigrosin and Gram staining. For culture, a loopful of specimen was inoculated on two sets of Sabouraud’s Dextrose agar (SDA), one with 0.04 mg/ml chloramphenicol, 0.5 mg/ml cycloheximide and one without chloramphenicol and cycloheximide. The SDA slants were observed daily for the presence of growth. If there was no growth for 4 weeks, they were discarded. Evaluation of the amount of growth was done by Kahanpaa et al. Criteria for diagnosis of candidiasis in present study were 1) heavy growth of candida i.e. more than 30 colonies in the culture. 2) presence of budding yeast cells, pus cells along with pseudohyphae in Gram stained smears. Identification of Candida species was
done by germ tube test, growth pattern on Cornmeal agar and sugar assimilation tests.

**Results**

Out of the 100 cases of pulmonary tuberculosis, *Candida species* was isolated in 26 cases (26%). In 10 cases there was scanty growth of *Candida species* on SDA but the primary smears showed only budding yeast cells, without pus cells and pseudohyphae suggesting colonization and these cases were reported as “non-significant fungal growth”. *Candida albicans* was the commonest species isolated in 92.31% (24/26) cases, followed by *Candida tropicalis* and *Candida parapsilosis* in one case each 3.25% (1/26). No other species of candida like *Candida krusei* or *Candida pseudotropicalis* was reported in the study.

**Discussion**

There is a considerable variation of 9% to 80% in incidence reported in the literature on the occurrence of *Candida species* in sputum of patients with pulmonary tuberculosis. Jain et al. from India, reported isolation in 23.57% of cases. Our findings are comparable with this study. Out of the 26 commonest isolate was *Candida albicans* in 92.31% (24/26) cases, followed by *Candida tropicalis* and *Candida parapsilosis* in one case each 3.25% (1/26). No other species of Candida like *Candida krusei* or *Candida pseudotropicalis* was reported in the study.

**References**