

SPECTRUM OF OPPORTUNISTIC PULMONARY INFECTIONS OTHER THAN TUBERCULOSIS IN PATIENTS WITH HIV

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ABSTRACT: This study was designed to document the prevalence of pulmonary infections other than tuberculosis in patients with HIV. The study includes 50 patients with HIV Infection whose sputum sample was evaluated for presence of bacteria other than *Mycobacterium tuberculosis*. These patients were admitted in Tuberculosis and Chest diseases Ward for Pulmonary Tuberculosis. Both the expectorated and induced sputum samples were collected and processed for presence of bacterial and fungal pathogens including *Pneumocystis carinii*. From 50 HIV +ve cases with Lower Respiratory Tract infection 45 pathogens were isolated. They were *Streptococcus pneumoniae* (4.4%), *Staphylococcus spp* (24.4%), *Klebsiella pneumoniae* (13.3%), *E-coli* (8.8%). *Haemophilus influenzae* (2.2%). Polymicrobial isolation was observed. This could be probably related to low level of immunosuppression and low CD4 counts. Pure fungal growth indicated poor prognosis. No case of *Pneumocystis carinii* pneumonia was detected..

KEY WORDS: HIV, Tuberculosis, Opportunistic infection.

INTRODUCTION: With the advent of AIDS, opportunistic pulmonary infections associated with HIV are the most common and most serious presenting illnesses in our country^{1,2}. HIV-TB co-infection is a severe problem worldwide, but especially of concern in India where background rates of Tuberculosis are highest.^{1,9} Reports of Lower Respiratory Tract Infections (L.R.T.T.) caused by *Mycobacterium tuberculosis* have been documented earlier, but those caused by other respiratory pathogens are rare. Hence the present study was undertaken to study the prevalence of respiratory pathogens in HIV positive patients other than *Mycobacterium tuberculosis*.

MATERIALS & METHODS: The present study was undertaken in 50 HIV cases with Lower Respiratory Tract Infections admitted in Tuberculosis and Chest diseases ward during one year period. In patients who were clinically and radiologically negative for pulmonary tuberculosis, an early morning expectorated sputum sample as well as induced sputum sample was collected in a sterile wide mouth container and transported immediately to the Microbiology Laboratory. Sputum samples were stained by Gram Stain and Ziehl- Neelsen Stain after confirming that the sputum samples were satisfactory. Induced sputum samples were processed for presence of *Pneumocystis carinii* trophozoites and cysts. Giemsa stain was also performed for presence of *Pneumocystis*

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carinii. The sputum samples were inoculated on Blood Agar, Chocolate Agar and Mac Conkey's Agar for bacterial pathogens and SDA (Sabouraud's Dextrose Agar) for fungal pathogens. The sputum samples were also inoculated on LJ media. However, none of the samples grew *Mycobacterium tuberculosis*. The other isolates obtained were characterized by their morphological and cultural characteristics and biochemical reactions as per standard techniques.³ Antimicrobial susceptibility testing were performed according to CLSI guidelines⁴.

RESULTS/OBSERVATION: Out of 50 expectorated sputum samples processed, culture was positive in 43 cases and 2 cases showed contamination. The distribution of organisms according to their Gram character were as follows:

Table No. 1 = 45

S. No.	Morphology on gram stain	Number	%
1)	Gram positive Cocci	27	57.7%
2)	Gram negative coccobacilli	1	2.2%
3)	Gram negative rods	16	35.5%
4)	Gram positive budding yeast cells	1	2.2%
5)	Gram positive thick bacilli	2	4.4%
		45	

Table No. 2 Shows distribution of pathogens in 43 expectorated sputum samples

S. No.	Bacterial Isolate	Number	%
1)	<i>Streptococcus pyogenes</i>	11	25%
2)	<i>Streptococcus Pneumoniae</i>	2	4.4%
3)	<i>Streptococcus viridans</i>	3	6.8%
4)	Coagulase (+) ve staphylococci	5	11.3%
5)	Coagulase (-) ve staphylococci	6	12.2%
6)	<i>Haemophilus influenzae</i>	1	2.2%
7)	<i>Klebsiella pneumoniae</i>	6	12.2%
8)	<i>E. Coli</i>	4	9.9%
9)	<i>Pseudomonas aeruginosa</i>	3	6.8%
10)	<i>Citrobacter freundii</i>	1	2.2%
11)	<i>Enterobacter aerogenes</i>	1	2.2%
12)	<i>Candida albicans</i>	1	2.2%

DISCUSSION: The importance of respiratory infection in AIDS patients is well documented. As per figures from NACO, the common organisms encountered in Pulmonary infections in HIV positive patients were *Mycobacterium tuberculosis* and *Pneumocystis carinii*.^{5,12} In this study emphasis was given on respiratory infections other than tuberculosis. Induced sputum samples were processed for presence of *Pneumocystis carinii*. Induced sputum with 28.55% sensitivity for PCP can be used as an alternative to invasive BAL to diagnose PCP¹³. In the Indian context, PCP can occur with other pulmonary infections including tuberculosis, cryptococcosis and CMV¹⁴. A diagnosis of PCP must be considered in patients with a diverse array of pulmonary clinical and radiological presentations.

Pneumocystis carinii causes severe pneumonia in patients with HIV. Occurrence of PCP establishes the diagnosis of HIV and it is the most common AIDS defining illness in the developed world¹⁵. In India, very low rates 0.7 to 7% of PCP have been reported^{16,17}. Some reasons for this could be predominance of other pulmonary diseases like tuberculosis and due to under diagnosis of incident cases. PCP occurs in patients with CD₄ counts under 200 cells per μ l^{6,17}. In our study, we could not detect any case of *Pneumocystis carinii* pneumonia.

Pulmonary infections of fungal origin occur less commonly in immuno compromised patients and is attributed to low CD4 counts^{6,18}. Fungal pathogens frequently coexist with other bacterial pathogens. In this study *Candida albicans* was associated with *Staphylococcus aureus* in 1 case. In one study by Ayyagari et al 1999¹⁹ found tuberculosis to be the commonest infection in HIV positive patients followed by candidiasis. In our study one case of candidiasis was isolated. The other bacterial pathogens which were isolated were less common in immunocompetent individuals. They included *Citrobacter freundii* and *Enterobacter aerogenes*. In the present study an attempt was made to demonstrate the presence of trophozoites/cysts of *Pneumocystis carinii* in induced sputum samples. However none of the samples were positive for *Pneumocystis carinii* Cysts or Trophozoites.

This study demonstrates that lower respiratory tract infections in HIV +ve patients caused by non-tubercular pathogens was significantly higher and included pathogens which were not routinely isolated in normal individuals with Lower Respiratory Tract infections. Patients with AIDS are at increased risk for community acquired bacterial pneumonias. Such pneumonias should be included in the differential diagnosis of pulmonary infiltrates in this group. Because of the large number of potential pathogens an aggressive diagnostic approach to establish the specific etiologic diagnosis and implement appropriate therapy is warranted.

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