

Original Research Article

Yield of AFB by direct sputum smear examination with bronchial washings and post bronchoscopy sputum smear examination

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Abstract

Background and objectives: The objective of the present study is to evaluate the yield of AFB by direct sputum smear examination with Bronchial Washings and Post Bronchoscopy sputum smear examination.

Materials and methods: This prospective study was conducted on 100 patients with suspected pulmonary TB October 2015 – September 2017 at S.V.S Medical College, Mahabubnagar.

Results: Out of 100 clinically suspected, sputum smear negative cases, 38 cases were diagnosed as active pulmonary tuberculosis. Bronchial washings for AFB smear was positive in 32/100 (32%) of cases and post bronchoscopic sputum smear was positive in 16/100 (16%) of cases. Both bronchial washings and post bronchoscopic sputum smear for AFB was positive in 10 (10%) of cases. 4/16 additional cases are diagnosed by post bronchoscopic sputum smear over the bronchial washings. Total yield of bronchoscopy in the diagnosis of sputum negative Pulmonary Tuberculosis was

38.00% of which bronchial washing smear samples are superior in the diagnosis and is contributed to 32% .

Conclusion: It has shown that additional yield of 38% more than direct sputum smear examination, which helps to initiate early treatment of tuberculosis.

Key words

Smear negative PTB, Bronchoscopy, Bronchial wash, Post bronchoscopy sputum, AFB.

Introduction

India has the highest burden of tuberculosis in the world and account for nearly one fifth of the global burden of tuberculosis per year [1]. Evidence of pulmonary tuberculosis can be frequently obtained from sputum smear stained for Mycobacteria, yet tuberculosis prevalence surveys have shown that in a substantial proportion of persons with active tuberculosis sputum smear for AFB bacilli negative but culture for mycobacterium tuberculosis are positive which has been observed in 22 to 61% of the cases [2]. The difficulty is compounded by the fact that the growth of mycobacterium tuberculosis requires up to eight weeks pose diagnostic problems and therapeutic dilemma to the chest physicians. Fiber optic bronchoscopic studies provide various types of specimens (bronchial washings, bronchial lavage, bronchial biopsy and bronchial brushings) for early diagnosis of sputum smear negative pulmonary tuberculosis.

Materials and methods

Study Design

This prospective study was conducted on 100 patients with suspected pulmonary TB October 2015 – September 2017 at S.V.S Medical College, Mahabubnagar.

Data Collection

The patients involved in this study are two (spot and overnight) sputum smear negative with clinically and radiologically suspected cases of pulmonary tuberculosis. All sputum negative cases were subjected to bronchoscopy.

Statistical Analysis

Data was analyzed by statistical package for social sciences (SPSS) Version 16.0. Numerical data was summarized by mean \pm standard deviation for continuous normal data and median \pm Inter-Quartile Range for continuous non normal data/ordinal data. Categorical data was summarized by count and percentages. The association between categorical variables was done by Chi square test. All the P values less than 0.05 were considered as statistically significant.

Results

The total number of patients involved in this study was 100, out of which 64 males patients (64%) and 36 females patients (36%). The most common age group involved in this study was in between 15-30 years (42%). The youngest patient was aged 18 years and the oldest was 72 years. Most of the patients presented to hospital in less than 2 months of onset of symptoms that was in 42.0%. Cough was the most common symptom, present in all the patients (100%), followed by fever (70.0%) and constitutional symptoms (64.0%). The other symptoms including expectoration (34.0%), dyspnoea (26.0%), haemoptysis (14.0%) and chest pain (0.10%) (**Table - 1**). 68 (68%) patients had unilateral lesions (right or left) and 32 (32%) had bilateral lesions. 24 (24%) had cavitary lesions, and 76 (76%) had infiltrations without cavitations on chest radiography (**Table - 2**). The most common bronchoscopic finding was congestion with mild to moderate hyperemia with whitish plaques of variable size in between, and it observed in 82 (82%) cases. In the remaining cases erosions and ulceration in 32 (32%), intrabronchial bleeding 16(16%) and intrabronchial growth 4 (4%) was observed. Bronchial washings smear for AFB

was positive in 32/100 (32%) cases, out of this predominant age group that shows more positivity belongs to 15 – 30 years (42.85%) followed by 31-45 years (40.0%). Post bronchoscopic sputum smear for AFB was positive in 16/100 (16%) cases, out of this predominant age group that shows more positivity belongs to 15 – 30 years (23.80%). Bronchial washings smear for AFB was positive in 32/100 (32%) cases, and Post bronchoscopic sputum smear for AFB was positive in 16/100(16%) cases, and in 5 (10%) cases both post bronchoscopic sputum and bronchial washings are positive. Total yield of bronchoscopy in the diagnosis of sputum negative Pulmonary Tuberculosis was 38.00% of which bronchial washing smear samples are superior in the diagnosis and was 32%.

Table - 1: Symptomatic distribution of patients.

Symptoms	No of patients	%
cough	100	100
expectoration	34	34.0
fever	70	70.0
dyspnoea	26	26.0
hemoptysis	14	14.0
chest pain	10	10.0
constitutional	64	64.0

Table - 2: Distribution based on bronchoscopy findings.

Finding	No. of patients	%
Congestion/ Hyperemia	82	82
Erosions, ulcerations	32	32
Bleeding	16	16
Growth	4	04

Discussion

The WHO Expert Committee on Tuberculosis recommends that patients of pulmonary tuberculosis in whom the disease has not been confirmed bacteriologically should be classified as “suspects” till the presence of AFB is demonstrated and a patient with persistent symptoms whose sputum does not contain AFB should be followed up and anti-tubercular

treatment should be given only if the diagnosed bacteriologically.

In our study, we had selected 100 patients with sputum smear negative on two occasions, out of which 64 were males and 36 were females. This was comparable to the study done by Purohit, et al. [3], where in the sample size of 50 cases, they had 35 males and 15 females.

Out of the 100 patients in our study, 100patients presented with cough (100%), 34 patients (34%) had cough with expectoration, 70 (70%) patients had fever, 14 patients (14%) had hemoptysis and 10 patients (10%) presented with chest pain. These patients’ characteristics were similar to the study done by D D S Kulpati, et al. [4]. In our study, the BAL fluid smears were taken in all 100 cases and were positive for AFB in 32 (32%) patients. In previous studies, it varied from 7.5% to 57.1% in studies done by S Charoenratanakul, et al. [5] and Malekmohammad M, et al. [6] respectively.

In our study, Post bronchoscopy sputums were collected on 3 occasions and subjected to smear for AFB yielding 8% (16/50). This was comparable to the 23% positivity (7 out of 30 cases) in post bronchoscopy sputum studied by Wongthim, et al. [7]. Kulpati, et al. also noted 25% positivity (5 out of 20 cases) by PBS culture and 26% AFB smear positivity was noted by Purohit, et al. [3]. During our study, we were able to diagnose 38 cases out of 100 cases (38%) by combining 2 procedures.

Conclusion

The study concludes that flexible fiberoptic bronchoscopy along with post bronchoscopy sputum examination is a useful tool in early diagnosis of pulmonary tuberculosis in sputum smear negative patients. Bronchoscopy reveals a higher bacteriological confirmation of diagnosis in patients with strong clinical and radiological evidence suggestive of pulmonary tuberculosis. Thus bronchoscopic aided procedures should be undertaken in sputum smear negative pulmonary

tuberculosis patients with a high index of clinico-radiological suspicion.

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