



UTILITY OF BRONCHOSCOPY IN SPUTUM SMEAR NEGATIVE SUSPECTED TUBERCULOSIS PATIENTS

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ABSTRACT

Background: Pulmonary tuberculosis is highly prevalent in India and in routine its diagnosis confirmation is based on sputum microscopic and culture examinations. Many time either patients are unable to expectorate adequate sputum or staining results in negative results of mycobacterium tuberculosis despite clinical suspicion. Those Sputum smear negative pulmonary tuberculosis patients are diagnosis dilemma faced by clinicians. Bronchoscopy could be very helpful in diagnosing these cases which have no sputum or whose sputum smear is negative for acid fast bacilli. Objective of the our study was to analyze the utility of bronchoscopy in sputum smear negative clinico-radiological suspected cases of pulmonary tuberculosis. **Methods:** A total of 60 patients were selected for study between age group of 18-55 years. The chosen patients were clinical or radiological suspects of pulmonary tuberculosis. We have performed Bronchoscopy under local anesthesia. 0.9% saline is used for Bronchoalveolar lavage. Bronchoalveolar lavage was analyzed with Gram and Ziehl-Neelson stain, AFB and aerobic cultures and nucleic acid amplifications, cytology also done for brushing slides obtained. **Results:** All patients tolerated procedure well. No serious complications related to the procedure are noted after 48 hours of procedure. 31 out of 60 patients (51%) were confirmed tuberculosis using BAL AFB stain, cytology, NAAT, AFB Culture, while 9 out of 60 (15%) alternative diagnosis is made. **Conclusions** Our study suggest that in tuberculosis endemic area with high prevalence, bronchoscopic procedures considered to be done in suspect tuberculosis patients to confirm the infection with mycobacterium and to rule out other possible etiologies. It has signified importance of bronchoscopy in those areas even when patient is sputum smear and culture negative but clinical or radiological suspect of Tuberculosis

KEYWORDS :

INTRODUCTION:

Conventional method for diagnosing pulmonary tuberculosis is by sputum smear examination by Z-N staining or by Nucleic acid amplification methods.

However, many patients are unable to produce sputum and in many reports may be false Negative due to technical or sampling errors. Many times clinician advised to take ATT for those patient on clinical and radiological suspicion, it though convenient may cause over-treatment, drug resistance and unnecessary ATT induced complications in false positive patient.

Bronchoalveolar lavage is method to aspirate lower respiratory tract secretions using bronchoscope. Complications related to Bronchoscopy are minimal. Value of BAL in sputum smear negative patients has been reconfirmed by our study.

Case Study And Methodology

Study population:

A total of 60 patients aged 18-65 years are taken for our study. All cases were clinically or radiologically suspect of pulmonary tuberculosis and sputum smear were negative by Zeihl Neelson staining and NAAT methods on two consecutive day morning sputum sample. Informed written consent is obtained from all patients.

Procedure:

All patients underwent Standard bronchoscopy procedure under local anesthesia. 2ml of 4% Lignocaine was administered at vocal cords, trachea and at carina with spray as you go technique. Patients monitored during and post procedure with vital signs and clinical evaluation for any complications related to the procedure.

Chest x-ray or computed tomography scans (CT) guided the lung segment that need sampling. Bronchoalveolar lavage was taken after wedging bronchoscope in segment of interest radiologically and right middle lobe using 80 to 100ml of 0.9% normal saline with 20ml aliquots in one time.

Brush smears also made using disposable brushes from involved segments and areas where white cheesy material was visible during Bronchoscopy.

All specimens were stained with Ziehl Neelson staining, nucleic acid amplification for Mycobacterium tuberculosis and send for AFB liquid culture along with cytology, gram staining and aerobic culture.

RESULTS:

Total 60 patients were taken for the study; all were either clinical or radiological suspects of pulmonary tuberculosis infection.

23 out of 60 patient confirmed tuberculosis by Ziehl Neelson staining, cytology and NAAT test (38%) while AFB culture was shown growth in 8 of remaining and in 9 patients have alternative diagnosis is made by BAL aerobic culture. Total 31 out of 60 (51%) were confirmed tuberculosis and Anti tuberculosis treatment is started while 9 out of 60 (15%) alternative diagnosis is made by BAL analysis.

Bronchoscopic procedure	Tuberculosis OR alternate diagnosis	Percentage value
Z N STAIN & CYTOLOGY	16	26%
NAAT	7	11.6%
AFB CULTURE	8	13.3%
AEROBIC CULTURE AND GRAM STAIN	9	15%

DISCUSSION:

In tuberculosis high prevalent regions, most of the patients who are clinical or radiological suspect of pulmonary tuberculosis are started antitubercular treatment as clinically or physician diagnosed tuberculosis. This manner in routine however avoid patient from invasive techniques but result in false positive cases, and delay in treatment for alternate diagnosis and also overexpose patients to deleterious effects of ATT.

Bronchoscopy is now well established procedure for those cases along with other related interventions such as bronchoalveolar lavage, brush cytology and biopsy.

Those procedures are usually well tolerated and free from any serious complications. However cough chest pain and fall in arterial oxygen saturation are seen during and post procedure, usually reversed with supportive interventions without much adversities. Those procedures have good yield in confirming diagnosis in smear negative PTB suspects.

The diagnostic yield for pulmonary tuberculosis in our study was 51% & in 15% patients alternative diagnosis was made by bronchoscopic interventions. Acid fast bacilli confirmed by Ziehl Neelson stain and cytology confirmed tubercular granuloma was seen 26% patients while NAAT yielded 11.6% in ZN stain and cytology negative patients. In patients who not diagnosed by above methods AFB culture have yield of 13.3% in confirming tuberculosis. Alternate bacterium growth was seen in 15% patients. Results of this study are in line with old studies in this regard for bronchoscopy yield.

Baughman et al.7 retrospectively studied 50 patients and revealed sensitivity of positive smear and positive culture in bronchial wash or BAL as 68% and 92% respectively.

Nusrullah M et al.6 reported diagnostic yield of FOB for detection of positive cases in cases of Smear negative PTB was 57.5%. The highest diagnostic yield was seen in patients in the age group 16-32 and 49-60 years old patients i.e. 37% in both groups in a study of total 80 patients.

Imtiaz S et al.8 performed a retrospective analysis of patients with definite or probable pulmonary TB with overall negative (smear and/or polymerase chain reaction [PCR]) or scanty sputum that had undergone bronchoscopy with BAL over a period of 5 years BAL mycobacterial culture and MTB PCR were positive in 35 (71%) and 23 (47%) patients, respectively. Combined BAL MTB PCR and TBLB provided rapid diagnosis in 28 (57%) patients.

Luhadia A, Luhadia SK, Jain S, Hanfe MH, Oza D, Zota A, et al.9 has performed Fiberoptic bronchoscopy in 250 patients who were suspected for pulmonary tuberculosis infection but sputum for AFB smear was negative. During bronchoscopy, congestion and hyperaemia (36%) and mucopurulent/mucoid secretions (32%) were seen in maximum number of cases.

BAL was positive in 200 patients (80%), post bronchoscopy sputum was positive in 70 cases (28%) and biopsy was positive in 12 patients out of 16 performed biopsies (75%). The total TB positive cases after combining all the methods were 215 making the overall diagnostic yield of 86%.

Unni R Baby, Girija Nair¹⁰ has done prospective nonrandomized observational study on 40 patients who were sputum smear was negative for AFB on 2 occasions. In their study of 40 patients, tuberculosis was confirmed in 13 (32.50%) by smear examination of AFB in Broncho alveolar fluid and by post bronchoscopy sputum smear examination in 3/40 (7.5%) cases. A definitive diagnosis of tuberculosis was possible in 23 (57.5%) of the 40 patients by AFB culture by BACTEC MGIT960.

Limitations of the study:

We declare certain limitation in this study. In our study we have not analyzed post- bronchoscopy sputum for culture and transbronchial biopsy is also not done. These investigations might have increased the diagnostic yield of bronchoscopy as per various available literatures. Also sample size taken for study is small.

CONCLUSION:

Our study proves that bronchoscopy is a safe and effective minimal invasive procedure for diagnosis in sputum smear negative pulmonary tuberculosis patients. Bronchoscopic procedures have given an approx. 51% diagnostic yields in these cases.

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