Original Research Paper

Role of Bronchoscopy in the Diagnosis of Pulmonary Tuberculosis in Sputum Smear Negative Patients

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Abstract: - Around 30% of cases of pulmonary TB are sputum smear negative. Bronchoscopy can be a useful adjunctive technique to diagnose TB in such cases. Of the 114 smear negative patients who underwent bronchoscopy, 28 (24.56%) were turned to be smear positive. Of these, 6 (5.26%) were positive for AFB on post FOB sputum examination alone, 4 (3.50%) were positive on BAL examination alone, while 18 (15.79%) were positive with both these samples. The results of the study suggest that bronchoscopy is a useful diagnostic technique and should be performed, wherever possible, in all smear negative patients to avoid delay in diagnosing the disease and initiating treatment, thus effectively reducing its transmission to the community.

Key Words:- Fiberoptic Bronchoscopy, Smear negative Tuberculosis

Introduction

Tuberculosis (TB) is a disease known since time immemorial. Every four seconds,an individual contracts tuberculosis and one of them dies every 10 seconds[1]. The most widely used tool or diagnosis of pulmonary tuberculosis (PTB) is sputum examination and chest X-Ray. Sputum smear and culture examinations still remain the gold standard in the diagnosis of pulmonary tuberculosis[2] . Acid-fast bacilli (AFB) smears of respiratory specimens (at least two or more specimens) are important for the prompt diagnosis of PTB, but AFB smears have poor sensitivity (30–70%) despite high specificity (98–99%). Mycobacterial cultures are more sensitive than AFB smears (80– 85%), but culture results usually require 3–8 weeks[3]. Almost 30% of patients with tuberculosis are known to be sputum smear negative(SSN-PTB) (i.e., patients with clinical and radiological evidence of pulmonary TB but repeatedly negative sputum examination) which is a common clinical problem[4] and remains a diagnostic dilemma leading to inadvertent delay in the initiation of treatment[5] . It also leads to spread of infection in the community. The reasons for smear negativity are lack of sputum production, low bacterial yield, and at times incorrect or improper sampling. Confirming tuberculosis by microbiological diagnosis is of utmost importance as it leads to the prevention of over treatment.

A more quick procedure needs to be undertaken in these patients in order to establish the microbiological diagnosis and start the treatment early. A number of studies confirm the usefulness of fiberoptic bronchoscopy (FOB) in the diagnosis of pulmonary tuberculosis[6,7]. FOB under local anaesthesia has been found to be a relatively safe procedure and is well tolerated by most of the patients[8]. It is helpful in obtaining multiple specimens like broncho-alveolar lavage (BAL), post bronchoscopy sputum (PBS), trans-bronchial needle aspiration (TBNA) which can be used for microsocopy by ZN staining or

fluorescent stain, culture and cytology[9]. This study was carried out to assess the role of FOB in sputum smear negative pulmonary TB in a tertiary care hospital.

Material and methods

The patients who were clinically and radiologically suspected to have PTB were included in the study. 114 patients, more than 16 years old, with two sputum smears negative for acid fast bacilli (AFB) as per the Revised National Tuberculosis Control Programme (RNTCP)were enrolled.The patients who had bleeding diathesis, had severe dyspnea or did not give written consent for FOB were excluded from the study.Patients were subjected to (FOB) under local anesthesia, through the transnasal/oral route, after taking written informed consent. A thorough examination of the bronchial tree was carried out and BAL and post bronchoscopy sputum(PBS) were collected. The specimens obtained were sent for smear examination for AFB by fluorescent microscopy as per RNTCP guidelines. Post procedural complications were noted.

Results

Out of 114 patients 65 (57.02%) were males and 49 (42.98%) were females. The mean age of the patients was 42.11 years with the youngest patient being 16 years old and the oldest one being 80 years of age. 97 (85.08%) patients did not give any history of previous treatment of TB. 23 (20.17%) patients had history of contact with TB patient. All the patients had cough and low grade fever for more than four weeks. Just 39 (34.21%) of these patients had undergone sputum smear examination before coming to this hospital.

Of the 114 smear negative patientswho underwent bronchoscopy, 28 (24.56%) were diagnosed as pulmonary tuberculosis. Of these, 6 (5.26%) were positive for AFB on post FOB sputum examination alone, 4 (3.50%) were positive on BAL examination alone, while 18 (15.79%) were positive with both these samples (Table 1). All the 28 patients were given anti tubercular treatment, to which they responded well, both clinically and radiologically.

Out of 86 patients 4 patients had malignant cells in their secretions and 22 had pyogenic infections.

Table 1:

Specimen	Positive(%)
Post Bronchoscopy sputum	24 (21.05%)
Bronchoalveolar Lavage	22 (19.30%)
Both	28 (24.56%)

Discussion

Diagnosing patients with clinical and radiological features suggestive of tuberculosis but sputum smear negative for AFB is a big challenge. Culture results in these patients leads to a delay in treatment; on the other hand, empirical treatment initiation in these patients increases the number of unnecessary over treatment. Flexible fiberoptic bronchoscopy (FOB) has been reported to be a useful tool in the confirmation of the diagnosis of PTB, especially in patients with SSN-PTB[6].

This study found that PBS was useful in diagnosing 24 (21.05%) out of 114 patients and BAL helped diagnose 22 (19.30%) patients. Used together, they could diagnose 28 (24.56%) out of the sample of 114patients.

Adding FOB, and subjecting the bronchoscopic secretions/TBLB material to conventional diagnostic methods of AFB smear, mycobacterial culture and histopathology is helpful in the diagnosis of SSN-PTB[6]. The FOB also offer the additional advantage of the confirmation of diagnosis of several non-TB conditions that may mimic PTB as well and also it helps in viewing the endo-bronchial lesions which may be missed in Xray. The availability of this equipment and the expense incurred in carrying this procedure is a draw back. But are available this procedure should be included in diagnosis of TB.

In a study by Singhal et al, 15 out of 42 patients were diagnosed to have Pulmonary TB. As in our study this study also diagnosed malignancy and other pathologies.

A study by Soto et al concluded that the analysis of BAL samples and post-bronchoscopic sputum samples provides a high diagnostic yield in smear-negative patients suspected of having pulmonary tuberculosis[11]. In their study 23% were diagnosed with tuberculosis based on the analysis of BAL samples.

In one study patients with suspected pulmonary TB underwent multiple induced-

sputum sampling for microscopy, culture and nucleic acid amplification (NAA). Those with negative induced-sputum results still suspected with TB are then referred for bronchoscoay[12].

It has also been suggested that there is need to formulate guidelines where the respiratory physician can make a definitive diagnosis without increasing the number of unnecessary treatment in new sputum negative tuberculosis patients and FOB can provide an excellent material the for diagnosis of suspected TB .

Conclusion

FOB has an important role in the diagnosis of patients suspected to have tuberculosis, whose sputum smears are negative or who cannot produce sputum. This study suggests that in tertiary care hospitals of areas with high TB prevalence, bronchoscopic procedures should be performed in those cases in which other diagnoses such as malignancy, foreign body, etc. ruled out.

This study cannot be generalised as it was in a tertiary care setting with the availability of the FOB. The carry home message from this study is that TB which is highly prevalent in India should be suspected and diagnosed as early as possible and where available FOB should be judiciously used to diagnose TB at the earliest.

Conflict of Interest None

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