Diagnosing pulmonary tuberculosis with fibre-optic bronchoscopy and its significant role

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Editorial

The 1990 World Health Organization (WHO) report on the Global Burden of Disease ranked tuberculosis as the seventh most morbidity-causing disease in the world, and expected it to continue in the same position up to 2020. Someone somewhere contracts tuberculosis every four seconds and one of them dies every 10 seconds. In 2006, about 1.4 million cases of tuberculosis were registered for treatment in India; 28.7% of them were new smear negative cases. The initial diagnostic approach to suspected cases of pulmonary tuberculosis is to demonstrate Mycobacterium tuberculosis in stained smears of expectorated sputum. In most of the tuberculosis centers, even after meticulous search, the bacteriological positive yield from sputum is around 16 to 50% and large portion remain negative in spite of clinical profile and radiological lesions being consistent with diagnosis of pulmonary tuberculosis. Early diagnosis of pulmonary tuberculosis prevents progression of disease, morbidity, spread of disease and permanent damage by fibrosis. Culture of sputum for acid fast bacilli (AFB) takes long time and a reliable serological test is not yet available. In such a situation bronchoscopy has been tried for rapid diagnosis of tuberculosis in smear negative cases. Fibreoptic bronchoscopy with bronchial washing analysis for AFB including culture for Mycobacterium tuberculosis has significant role to establish the diagnosis when extensive search for AFB in expectorated sputum has repeatedly failed, when sputum expectoration is absent or sputum induction has failed. The present study aims to assess the role of fibreoptic bronchoscopy in the diagnosis of sputum/smear-negative pulmonary tuberculosis. The present study, approved by the institutional ethics committee, was conducted in the Department of Pulmonary Medicine. Clinically suspected cases of pulmonary tuberculosis, aged 16-75 years, with three sputum smears negative for AFB and a chest radiograph suggestive of pulmonary tuberculosis were included in the study after obtaining an informed consent. Patients with bleeding diathesis, history of myocardial infarction or arrhythmia, extra-pulmonary tuberculosis, history of anti-tubercular treatment (ATT) for more than one month, and those with severe dyspnoea were excluded from the study. HIV-positive and non-cooperative patients were also excluded. A detailed history, clinical examination, and routine investigations were carried out on suspected cases of tuberculosis. Three sputum samples (spot, morning and spot) were tested for presence of AFB in the smear. In patients with suspected smear negative pulmonary tuberculosis, a sputum sample was sent for sputum culture (BACTEC) and the patients were taken up for bronchoscopy. Prior to the procedure an informed written consent was obtained from the patient. The procedure was carried out electively with the patient nil orally for four to six hours. Patients were pre-medicated 30-45 minutes prior to bronchoscopy with 0.6 mg atropine and nebulization was done with two per cent xylocaine via ultrasonic nebulizer. Bronchoscopy was carried out under local anesthesia. Olympus BF type E2 bronchoscope was used. Bronchial washing was performed by instilling 0.9% isotonic saline at room temperature through the internal channel of the fibreoptic bronchoscope and aspirated into a trap connected to suction tubing. Usually 15-30 ml of fluid was instilled with each washing and about one-fourth to half of this volume was retrieved in the suction trap. Up to one-fourth of the instilled amount retrieved was considered successful. No studies, however, have established the ideal volume of fluid for optimum results. The bronchial washings were sent for AFB staining, AFB culture by BACTEC, and for cytology and cell count. Transbronchial lung biopsy was done with the biopsy forceps and sent for histopathological examination. In cases where an endobronchial growth was seen washing, brushing and biopsy were performed. After the procedure, the patient was observed for development of pneumothorax, hemorrhage, infection and cardiac arrhythmias for 24-48 hours. The first sputum sample after bronchoscopy (post-bronchoscopic sputum) was collected and sent for analysis along with bronchial washings. Statistical analysis was done by McNemar test using SPSS 13.0. Bronchoscopy was performed on 75 patients. Characteristics of the patients. The most common bronchoscopic finding was congestion with mild to moderate hyperemia with whitish plaques of variable size in between, observed in 53 (70.6%) patients. In 21 patients (28%), ulceration, erosion or granulation was seen. In all patients with cavitatory lesion the mucosa was ulcerated and swollen. In five patients ulcerative lesions were observed with extensive areas of pulmonary involvement radiographically. In 16 patients (21.3%) the segmental openings were narrowed and slightly deformed. Endobronchial growth was seen in three patients (4.0%). Transbronchial biopsy revealed caseating granuloma in 10 patients with acid fast bacilli in two patients only. Out of the 10 patients two had bronchial washings positive for acid fast bacilli. Non-caseating granulomas were observed in 19 patients suggestive of tuberculosis. This diagnosis was confirmed by pre-bronchoscopic sputum culture for AFB in 10, bronchial washings smear and culture for AFB in eight and post bronchoscopic sputum smear for AFB in one patient. Nonspecific chronic inflammatory changes were the findings in 27 patients and normal histology was observed in the remaining 15 patients. No serious complications were encountered during the study, except pneumothorax (less than 10%) in four patients and minimal hemoptysis (less than 10 ml) in 16 patients.