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ORIGINAL ARTICLE

Efficacy and safety of bronchoscopic diagnostic procedures of sarcoidosis: A retrospective study



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KEYWORDS

Sarcoidosis;
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Abstract Sarcoidosis is a chronic systemic granulomatous disorder of unknown etiology, which most commonly presents with bilateral hilar adenopathy and pulmonary infiltrates. Fiberoptic bronchoscopic procedures are the most important tools for the diagnosis sarcoidosis.

Purpose: A retrospective study was done to evaluate the efficacy and safety of bronchoscopic diagnostic procedures in pulmonary sarcoidosis.

Patients and methods: This retrospective study was done by reviewing the records of the bronchoscopic procedures and pathological reports performed between May 2012 and September 2015 to assess the diagnostic yield, and safety and bronchoscopic procedures (TBNA, EBB and TBLB) of cases of sarcoidosis done in the bronchoscopy unit of Chest Department, Mansoura University. We included adult patients with mediastinal lymphadenopathy with or without diffuse pulmonary infiltrate with suspected sarcoidosis with indicated fiberoptic bronchoscopy and excluded patients unfit for FOB with uncorrectable bleeding diathesis, patients with uncontrolled cardiac comorbidities and respiratory failure. The diagnostic yield and complications were the end-points of our study.

Results: Regarding the diagnostic yield, TBNA showed the diagnosis of 4 out of 8 patients (50%) in stage I and 3 out of 5 patients (60%) in stage II. In all the studied cases, TBNA showed the diagnosis of 7 out of 13 patients (53.8%). EBB showed the diagnosis of 2 out of 2 (100%) in stage I, 1 out of 2 patients (50%) in stage II and 1 out of 2 patients (50%) in stage III. In all the studied cases, EBB showed the diagnosis of 4 out of 6 patients (66.7%). TBLB/EBB showed the diagnosis of 6 out of 12 patients (50%) in stage II and diagnosis of 4 out of 7 patients (57%) in stage III. In all the studied cases, TBLB/EBB showed the diagnosis of 10 out of 19 patients (52.6%). Pneumothorax developed only in 4 patients (12%), hemoptysis developed in 5 patients (16%) and no procedure related mortality.

Conclusion: The bronchoscopic diagnostic procedures (TBNA, EBB and TBLB) are effective and safe in the diagnosis of pulmonary sarcoidosis.

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Introduction

Sarcoidosis is a systemic granulomatous disease of unknown etiology. It is often suspected when a chest X-ray performed for non-specific symptoms such as dyspnea or chest pain shows the characteristic findings of bilateral hilar adenopathy with or without diffuse pulmonary infiltrates [1].

The classification system developed 50 years ago remains in use even today. In stage I hilar and mediastinal lymphadenopathy alone are present. Stage II is defined by adenopathy plus pulmonary infiltrates, stage III by pulmonary infiltrates alone and stage IV includes radiographic evidence of pulmonary fibrosis. More recently stage 0 has been added when the chest roentgenogram shows none of these abnormalities [2].

Bronchoscopic procedures are most often done for detection of granulomas because the lung and hilar or mediastinal lymph nodes are the most affected sites in sarcoidosis [3].

The most commonly used bronchoscopy procedures include transbronchial lung biopsy (TBLB) for sampling lung parenchyma, endobronchial biopsy (EBB) for detecting granuloma in the airways, and transbronchial needle aspiration (TBNA) for sampling mediastinal and hilar lymph nodes. Bronchoalveolar lavage (BAL) helps in the diagnosis and exclude tuberculosis and fungal infections [4]. Realtime convex probe endobronchial ultrasound-guided TBNA (EBUS-TBNA) has been demonstrated to have an excellent yield in sarcoidosis, due to direct visualization of the lymph nodes behind the tracheobronchial wall [5].

The diagnostic yield of TBLB ranges from 60% to 97% depending on the radiographic stage of the disease and the number of biopsies performed [6]. In radiographic stage I where the pulmonary parenchyma appears normal on plain radiograph, the yield is approximately 50% [7]. The number of biopsies required to maximize diagnostic yield is about 4–5 [8].

Endobronchial affection is frequent in pulmonary sarcoidosis. In the presence of abnormalities of the bronchial mucosa including nodularity, hyperemia, EBB has been reported to be diagnostic in over 90% of cases. Even when the mucosa appears normal, a positive biopsy may be obtained in about 30% of cases. Moreover, the addition of EBB to TBLB increases overall diagnostic yield [9].

In BAL for sarcoidosis, an increase in lymphocytes can be found in 90% of patients with sarcoidosis at the time of diagnosis. Patients with active disease tend to have higher lymphocyte counts than those with inactive sarcoidosis but the range is wide, and BAL may be normal in 10–15% of patients. In late or advanced sarcoidosis, neutrophils may also be increased as well as the mast cells [10].

The aim of this retrospective study was to evaluate the efficacy and safety of bronchoscopic diagnostic procedures of sarcoidosis of the lung.

Patients and methods

This retrospective study was done by reviewing the records of the bronchoscopic procedures and pathological reports performed between May 2012 and September 2015 to assess the diagnostic yield, and safety and bronchoscopic procedures (TBNA, EBB and TBLB) of cases of sarcoidosis done in the

bronchoscopy unit of Chest Department, Mansoura University.

Written consent was obtained from all the patients before the procedure. We included adult patients with mediastinal lymphadenopathy with or without diffuse pulmonary infiltrate with suspected sarcoidosis with indicated fiberoptic bronchoscopy and excluded patients unfit for FOB with uncorrectable bleeding diathesis, patients with uncontrolled cardiac comorbidities like intractable arrhythmia and respiratory failure.

This study included 31 patients 18 males (58.1%) and 13 females (41.9%) with median age 41.77 ± 13.04 .

All Patients were subjected to the following: clinical evaluation; (full history taking and clinical examination), laboratory investigation: (CBC, liver function, kidney function, bleeding profile, ESR, collagen profile), Spirometry (using Smart PFT CO with stress on FVC% and FEV1% of the predicted and FEV1/FVC ratio), chest X-ray and post contrast high resolution CT chest then FOB.

Fiberoptic bronchoscopy

Fiberoptic bronchoscopy was done in a bronchoscopy room for diagnosis. FOB (Pentax FB 19 TV, Tokyo, Japan, with porcelain tip and inner channel diameter of 3.2 mm) was used after local instillation of 2% lidocaine and IV 5–10 mg midazolam before the procedure. FOB was introduced via oral route.

During bronchoscopy, endobronchial abnormalities (nodularity, hyperemia or broad carina) were observed. BAL was done and sent for cellular pattern, bacterial and fungal culture and ZN stain for acid fast bacilli. TBNA was done from subcarinal lymph nodes or paratracheal nodes and the sample was prepared on glass slides and fixed in 95% ethanol and sent for cytopathological examination. EBB was done to patients with endobronchial nodular abnormality. TBLB was done to patients with parenchymal infiltrations and followed by EBB and the biopsies were prepared in formalin and sent for pathological examination. TBLB was performed from the most affected lobe on CT chest and it was done without fluoroscopy using the standard biopsy forceps. Chest X-ray was done after the procedure by 2 h and 24 h to detect post procedure complications.

Diagnosis of sarcoidosis

A diagnosis of sarcoidosis was made if the pathological tissue demonstrating non-caseating granulomas. Cases not diagnosed were diagnosed later on by mediastinoscopy, peripheral lymph node biopsy, skin biopsy or improvement on steroid therapy after clinical, radiological, culture and suggestive pathological correlation (epithelioid cells and lymphocytes but without granuloma formation).

Statistical analysis

Data were analyzed using SPSS (statistical package for social sciences) version 15. Qualitative data were presented as number and percent. Comparison between groups was done by Chi-Square test. Quantitative data were presented as mean \pm SD. Student *t*-test was used to compare between two groups. $P < 0.05$ was considered to be statistically significant.

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