Fiberoptic Bronchoscopy

Role of Fiberoptic Bronchoscopy in smear negative and suspect cases of pulmonary tuberculosis

T Jayachandra 1, PA Rao2, G Srinivas3, NVN Moorthy4, PVP Rao 5

ABSTRACT

In a tertiary hospital setting, 64 chest symptomatics with x-ray shadows suggestive of pulmonary tuberculosis were subjected to flexible fiberoptic bronchoscopy (FOB). The bronchial aspirate and post-scopy sputum specimen were examined by smear microscopy. 37 (58%) were found to be positive for AFB. The results demonstrate the usefulness of FOB in diagnosis of pulmonary TB at tertiary care centers.

Keywords: Pulmonary tuberculosis, Sputum smear negative, Fiberoptic Bronchoscopy.

INTRODUCTION

Sputum smear microscopy for Acid Fast Bacilli (AFB) has been the mainstay for the diagnosis of pulmonary tuberculosis (PTB), with culture as the Gold standard1-3. In GSL Medical college hospital, Rajahmundry, the sputum specimen from the chest symptomatics are collected in the sputum collection room of the laboratory and stained by Ziehl Neelsen (ZN) technique and examined by a Microbiologist under oil immersion lens of the microscope. The smears are routinely examined by concentration technique in our Microbiology department as a policy matter. The results are graded according to the RNTCP criteria. However, the smear negative TB suspects are an enigma in the diagnostic algorithm due to low specificity of chest x-rays. Fiberoptic Bronchoscopy (FOB) has been considered as an important tool in the diagnostic algorithm of respiratory illnesses since it gives access to the diseased areas of the lungs, enhancing the bacteriological and cytological yield4. The telescopic vision and extended reach to the diseased site by brush or biopsy forceps, even beyond the segmental orifices of the gigantic bronchial tree assists in greater diagnostic accuracy. Therefore, the present study was undertaken to examine the role of Fiberoptic Bronchoscopy (FOB) in the diagnosis of smear negative PTB.

STUDY DESIGN

A total of 556 chest symptomatics needed investigations to rule out PTB. They were subjected to sputum examination (two spot and one over-night sputum samples) by concentration technique using ZN staining. Specimen were mixed with equal parts of N-acetyl-L-cysteine-Sodium hydroxide solution, for 15 seconds on vertex mixture. Then enough Phosphate buffer saline was added to reach within 1cm of the top. The cap was closed tightly and tube was inverted to mix the solution. It was then centrifuged at 3600xg for 15 minutes. The supernatant was decanted and sediment was suspended in 1-2ml of Phosphate buffer5. This was taken for ZN staining. A minimum of 100 fields were examined and grading was undertaken as under 6.

1. Lecturer, Department of Microbiology, 2. PG in Microbiology, 3. Assistant Professor, Department of Tuberculosis & Chest Diseases, 4. Tutor, Department of Physiology, 5. Prof & Head, Department of Tuberculosis & Chest Diseases; GSL Medical College, Rajahmundry, Andhra Pradesh.
EXAMINATION GRADING

- > 10 AFB/ field 3+
- 1-10 AFB/ field 2+
- 10-99 AFB/ 100fields 1+
- 1-9 AFB/ 100fields Scanty
- No AFB/ 100fields Negative

Of 556 chest symptomatics, 172 (31%) were smear positive for AFB. The rest were smear negative, of them 64 patients with an X-ray shadow suggestive of tuberculosis were subjected to FOB which was undertaken jointly by two Pulmonologists. FOB was done with Olympus 2T 10 Fibroscope & FUJINON- BRO YL2. Patient was kept on empty stomach for 3 hrs before the procedure. Atropine injection (IM) 0.01mg/kg was given half an hour before the scopy. Midazolam 0.05mg/kg body weight was given exponentially with the comfort of the patient. Lidocaine (4%) was instilled through the channel for analgesia. The bronchial tree was inspected.

Bronchial aspirate/wash, brush smear were taken from the affected area. The postscopy sputum was also collected routinely. Both the specimens of the bronchial aspirate and postscopy sputum were sent for AFB. A part of the aspirate and brush smear were despatched for cytology. The quality assurance was fortified by examination of the slide by the Microbiologist of the team and the senior Pulmonologist.

Ethical committee of the hospital endorsed the study protocol and the study was undertaken during February-August 2004.

OBSERVATIONS & DISCUSSION

The study sample consisted of 40 males and 24 females, predominately 48 being in the age group of 21 to 50 yrs. Male and female ratio was 1: 0.6. The age & sex distribution is given at Table 1.

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Total cases</th>
<th>%</th>
<th>Males</th>
<th>%</th>
<th>Females</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>03</td>
<td>4.7</td>
<td>03</td>
<td>7.5</td>
<td>00</td>
<td>0</td>
</tr>
<tr>
<td>21-30</td>
<td>16</td>
<td>25.0</td>
<td>08</td>
<td>20.0</td>
<td>08</td>
<td>33.4</td>
</tr>
<tr>
<td>31-40</td>
<td>17</td>
<td>26.6</td>
<td>13</td>
<td>32.5</td>
<td>04</td>
<td>16.7</td>
</tr>
<tr>
<td>41-50</td>
<td>15</td>
<td>23.4</td>
<td>07</td>
<td>17.5</td>
<td>08</td>
<td>33.4</td>
</tr>
<tr>
<td>51-60</td>
<td>07</td>
<td>10.9</td>
<td>04</td>
<td>10.0</td>
<td>03</td>
<td>12.5</td>
</tr>
<tr>
<td>61-70</td>
<td>06</td>
<td>9.4</td>
<td>05</td>
<td>12.5</td>
<td>01</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td><strong>100</strong></td>
<td><strong>40</strong></td>
<td><strong>62.5</strong></td>
<td><strong>24</strong></td>
<td><strong>37.5</strong></td>
</tr>
</tbody>
</table>

All the cases subjected to FOB had evidence of inflammation on gross assessment and on biopsy. 37 (58%) of them were found to be AFB positive on bronchoscopy. Of these, 31 (48.43%) were positive for AFB by both bronchial wash and post-scopy sputum, and 6 (9.37%) were positive only by post-scopy sputum. These 37 cases were put on RNTCP category II regimen since all of them had a previous history of Anti-tuberculous treatment.

The findings of this study suggest that FOB could be the guide for the deceptive suspect cases of PTB even after concentration technique fails. Similar observations have also been made at other
However, its utility may have to be restricted to tertiary level medical care centres since this may not be applicable on large scale, considering the cost, feasibility and applicability.

REFERENCES:


