ORIGINAL ARTICLE

Post-tubercular still a major cause of bronchiectasis in India

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Introduction: Bronchiectasis is now being recognized more due to frequent use of high-resolution computerized tomography (HRCT). Etiology varies between different populations. Immune deficiency syndromes, metabolic, and ultrastructural defects are the predominant etiologic factors in developed countries, while bacterial and viral infections continue to be major causes of the disease in the developing countries. **Objective:** The objective of the study was to study the profile of bronchiectasis patients and establish its cause. **Materials and Methods:** A prospective study was conducted in Rohilkhand Medical College and Hospital, Bareilly, during October 2019 to March 2020 in patients with confirmed bronchiectasis on HRCT chest. **Results:** Out of 32 patients, 59.37% of patients were female. The most common symptom was cough with sputum 78.12%. Clubbing was present in 25%. On spirometry, obstructive pattern is seen in 62.5% cases, restrictive pattern is seen in 12.5% cases, mixed pattern in 18.75% cases and normal in 6.25% cases. *Pseudomonas aeruginosa* was the most common isolated pathogen 21.8%. On HRCT, cystic bronchiectasis was seen in 46.87%. The most common cause of bronchiectasis found was post-tubercular in 65.6% followed by COPD 21.8% and ABPA 12.5% of patients. History of TB was present in 65.6% of cases. **Conclusion:** Post-tubercular was the leading cause of bronchiectasis. Pseudomonas was the most common pathogen isolated from the respiratory specimen. On spirometry, obstructive impairment was found in majority of patients. Cystic bronchiectasis was mostly seen in post-tubercular patients while cylindrical type was seen in COPD and ABPA.

KEY WORDS: Bronchiectasis, post-tubercular, high-resolution computerized tomography thorax, cystic bronchiectasis, *pseudomonas aeruginosa*, cough with expectoration, obstructive spirometry

INTRODUCTION

Bronchiectasis is a growing global health problem.[1] Bronchiectasis (*broncos,* airways; *ectasia*, dilatation) is defined as "abnormal irreversible dilatation of one or more cartilage-containing airways – bronchi, caused by inflammatory destruction of the muscular and elastic component of bronchial walls."

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In today's scenario, bronchiectasis has been recognized more frequently because of more often use of high-resolution computerized tomography (HRCT).

Immune deficiency syndromes, metabolic, and ultrastructural defects are the predominant etiologic factors in developed countries, while tuberculosis, post-infection, idiopathic, and allergic bronchopulmonary aspergillosis are highly prevalent in the developing countries with less common causes as chronic obstructive pulmonary disease, asthma, rheumatoid arthritis and primary ciliary dyskinesia, non-tuberculous mycobacteria, gastroesophageal reflux disease, immunological deficiency, and alpha-1 anti-trypsin deficiency. CT scan in patient following treatment for tuberculosis has identified moderate and severe bronchiectasis in approximately 40% of patients.[1]

The classical clinical symptoms of bronchiectasis are daily cough and production of mucopurulent sputum. Purulent, tenacious sputum produced, frequently worsens in the morning (accumulated during recumbency during sleep) is present in most of the patients.

The diagnosis usually depends on presentation with a persistent chronic cough and sputum production accompanied by consistent radiographic features. Although chest radiographs lack sensitivity, the presence of "tram tracks" that indicate dilated airways is consistent with bronchiectasis. The chest X-ray may also show the increased pulmonary markings, atelectasis, ring-like structures, and mucus plugging (finger-in-glove).

Chest CT is more specific and is the imaging modality of choice for confirming the diagnosis of bronchiectasis. HRCT can accurately diagnose bronchiectasis, localize, and describe areas of parenchymal abnormality, and identify bronchiolar abnormalities and mucus plugging. It also can identify focal areas of air trapping as an indicator of small airway disease (mosaic attenuation).

Specific CT Findings Include

1. Airway dilation ("tram tracks" or "signet-ring sign" – a cross-sectional area of the airway at least 1.5 times that of the adjacent vessel)
2. Lack of bronchial tapering (including the presence of tubular structures within 1 cm from the pleural surface)
3. Bronchial wall thickening in dilated airways, inspissated secretions (e.g., the "tree-in-bud" pattern), or cysts emanating from the bronchial wall (especially pronounced in cystic bronchiectasis).

Non-specific Findings Include

1. Peribronchial cuffing (thickened hazy bronchial wall)
2. Finger in gloves (mucus filled bronchi)
3. Multiple air fluid levels (fluid-filled bronchi).

Cartier *et al*.[2] found that bilateral majorly upper lobe bronchiectasis is seen most commonly in CF, ABPA, and sequelae of tuberculosis. The middle-lobe involvement with irregular ground-glass nodules is characteristic of NTM. The lower lobe involvement is seen in most other causes.

Bronchiectasis has still been considered as an "orphan" disease because of low clinical suspicion, commercial interest, and research activity. Therefore, scientific concern in non-cystic fibrosis bronchiectasis diminished, with limited literature about this issue compared to other "obstructive lung diseases" and "pneumonia."[3]

Objective

The objective of the study was to study the profile of bronchiectasis patients and establish its cause.

MATERIALS AND METHODS

A prospective study was conducted in Rohilkhand Medical College and Hospital, Bareilly, during October 2019–March 2020 in patients with 32 confirmed bronchiectasis on HRCT chest.

RESULTS

Out of 32 patients, 59.37% (n = 19) of patients were female [Figure 1].

The most common symptom was cough with sputum 84.3% (n = 27), dyspnea 75% (n = 24), hemoptysis 28.1% (n = 9), and dry cough 15.6% (n = 5) [Figure 2].

The most common cause of bronchiectasis found was post-tubercular in 65.6% (n = 21) followed by COPD 21.8% (n = 7) and ABPA 12.5% (n = 4) patients. History of TB was present in 65.6% (n = 21) of cases [Figure 3].

Among post-tubercular patients (n = 21), the most common symptom is cough with expectoration found in 95.2% (n = 20) of patients, followed by dyspnea in 76.1% (n = 16) of patients, hemoptysis in 33.3% (n = 7) of patients, and dry cough in 3.1% (n = 1) of patients. Among non-tubercular patients, the most common symptom was dyspnea found in 72.7% (n = 8)

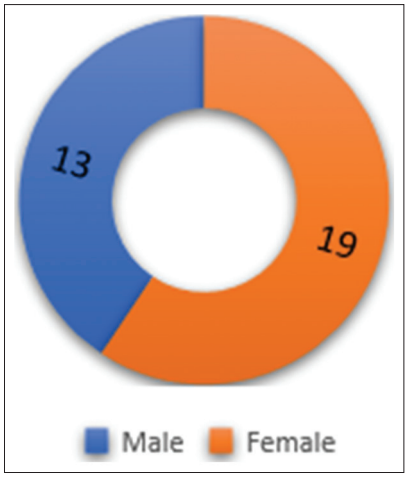

Figure 1: Gender distribution

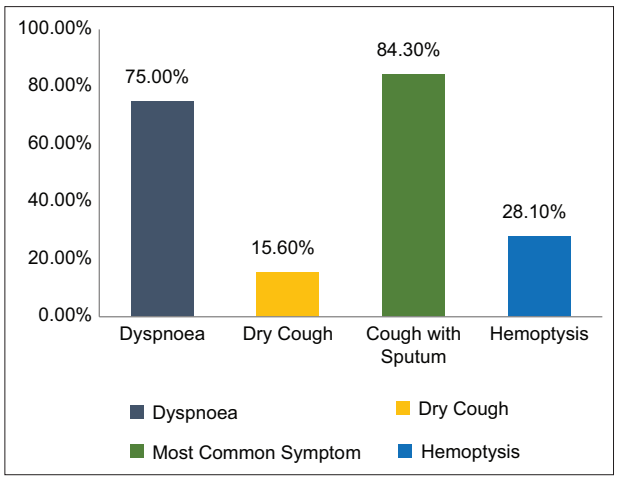

Figure 2: Most common symptom

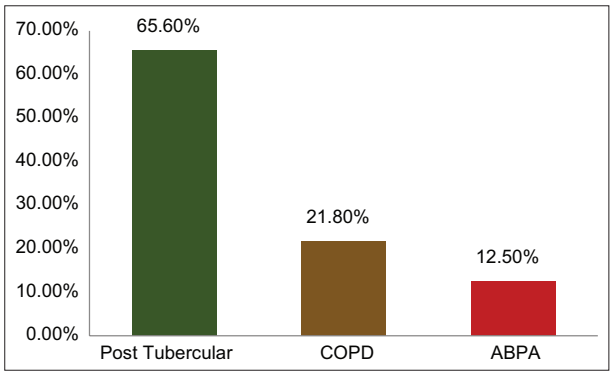

Figure 3: Most common etiology

of patients, followed by cough with expectoration in 63.6% (n = 7) of patients, dry cough in 36.3% of patients (n = 4), and hemoptysis in 18.1% (n = 2) of patients.

Clubbing was present in 25% (n = 8).

On spirometry, obstructive pattern 62.5% (n = 20), restrictive 12.5% (n = 4), mixed 18.75% (n = 5), and normal in 6.25% (n = 2) [Figure 4].

On HRCT, cystic bronchiectasis was seen in 46.87% (n = 15) followed by cylindrical 34.37% (n = 11) and varicose 18.75% (n = 6) [Figure 5].

Bilateral involvement was seen in 59.37% (n = 19) and upper lobe involvement was found in 75% (n = 24), middle lobe 43.75% (n = 14), and lingula 34.37% (n = 11). More than 1 lobe was involved in 71.8% (n = 23). Unilateral upper lobe involvement was seen in 53.12% (n = 17).

Pseudomonas aeruginosa was the most common isolated pathogen 21.8% (n = 7).

DISCUSSION

In my study, post-tubercular was the most common etiology found which was in correlation with Indian registry of bronchiectasis,[4] that is, 65.6% versus 35.5%, respectively, may be because my study was single-center study conducted in Uttar Pradesh for 6 months with higher tuberculosis burden in contrast to Indian bronchiectasis registry which was multicentric study conducted for 2 years across India.

The other causes are ABPA 12.50% which is in correlation with Indian Bronchiectasis Registry[4] which showed 8.4% cases of ABPA but EMBRARC[5] showed 2.6% of patients.

In my study, cystic bronchiectasis was most common in 46.87% [Figure 6] which is in correlation with Indian bronchiectasis registry[4] where cystic bronchiectasis was the most common type. The reason behind cystic bronchiectasis being the most common type is majority of the cases were post-tubercular.

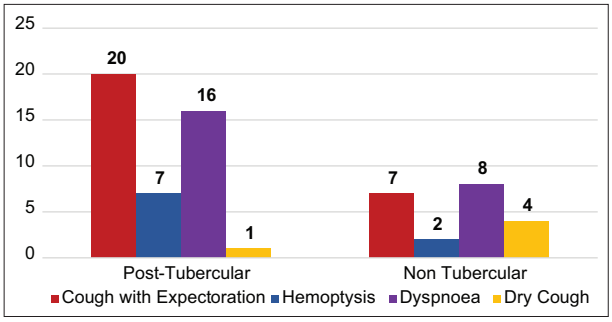

Figure 4: Comparison of symptoms in post-tubercular and non-tubercular patients

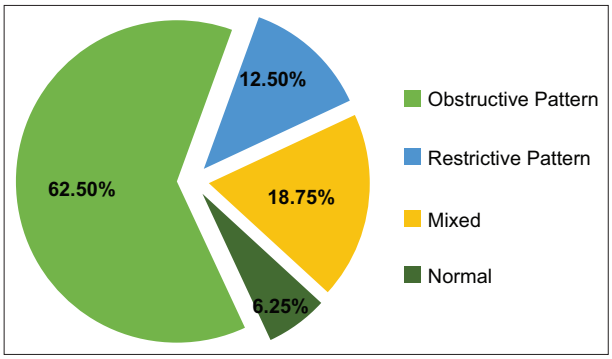

Figure 5: Spirometry pattern

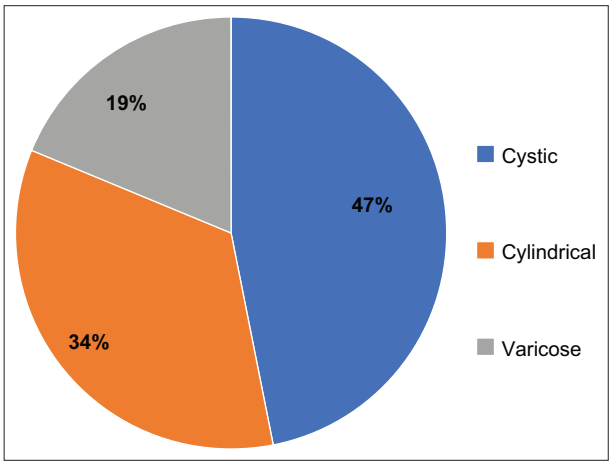

Figure 6: HRCT findings

Upper lobe involvement is most common in my study 75% as majority of the cases are post-tubercular as shown in Utpat *et al*.[6]

Limitations of the Study

It is difficult to generalize the result as sample size is low and also because, it is a single-centered study.

Due to COVID-19 pandemic, less cases were reported.

CONCLUSION

Post-tubercular was the leading cause of bronchiectasis. Pseudomonas was the most common pathogen isolated from the

respiratory specimen. Female predominance was seen. Cough with expectoration was the most common symptom. Among post-tubercular cases, cough with expectoration was found to be the most common symptom and among non-tubercular cases. Cough with expectoration was found to be the most common symptom and among non-tubercular cases, dyspnea was the most common symptom. In majority of the patients, on spirometry, obstructive pattern was present. Cystic bronchiectasis was mostly seen in post-tubercular patients while cylindrical type was seen in COPD and ABPA.

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