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Original Research Article

A HOSPITAL BASED PROSPECTIVE STUDY TO ASSESS THE ETIO-CLINICO-RADIOLOGICAL EVALUATION OF BRONCHIECTASIS PATIENTS AT TERTIARY CARE CENTER

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Abstract

Background: Bronchiectasis is a multidimensional disease, so its prognosis cannot be adequately determined by one isolated variable. The aim of this study was to identify the underlying causes of bronchiectasis in a large cohort of adult patients that were referred to our department with a history and radiological picture suggesting a diagnosis of bronchiectasis. **Materials and Methods:** A Hospital based observational prospective study done on sixty-seven confirmed patients suffering with bronchiectasis in TB & chest Hospital, Badi under Department of Respiratory medicine, R.N.T. Medical College, Udaipur, Rajasthan during one-year period. After applying Inclusion and Exclusion criteria, study population were selected. **Results:** Our study showed that maximum number 44 (65.67%) of the patients were in below 60 years of age and 23 (34.33%) patient were above 60 year of age. Male to female ratio was 3.47:1. Mostly patients were 49 (73.13%) patients were underweight according WHO BMI classification. COPD was the most common associated lung disease in bronchiectasis patients and diabetic mellitus was the common non-pulmonary disease associated with bronchiectasis. Most of the patients had mixed type of bronchiectasis on radiological examination and patients had bilateral bronchiectasis in radiological examination & upper zone were commonly involved. The common cause of bronchiectasis was infective found in 29 (43.28%) patients among them mycobacterial etiology was found in 21 (31.34%) and other infection was found in 8 (11.94%) patients. Common organism detected in the sputum of study population was mycobacteria. Maximum number of the patients had obstructive pattern in spirometric examination, 16 (37.21%) had restrictive pattern and 9 (20.93%) had mixed pattern. **Conclusion:** In this study the most common etiology for bronchiectasis was the post Tuberculosis infection. Prompt diagnosis and early initiation of anti-tuberculosis drugs should be started as early as possible to prevent this catastrophic condition to prevent chronic morbidity.

INTRODUCTION

Bronchiectasis is a condition in which an area of the bronchial lumen is permanently and abnormally widened, with accompanying infection. Bronchiectasis is found in a variety of pulmonary diseases, both in genetically and acquired conditions, such as cystic fibrosis (CF), severe pulmonary infections but is also a feature of Kartagener syndrome, chronic obstructive pulmonary diseases (COPD), alpha 1-antitrypsin deficiency, asthma, connective tissue diseases, interstitial lung disease or primary immune deficiencies.[1-3]

Bronchiectasis is caused by long-term excessive inflammatory damage to the airways, which results in tissue breakdown, enlargement of the affected airways and the key clinical symptoms of chronic productive cough and shortness of breath.[4]

This disease can lead to recurrent lower respiratory tract infections, worsening pulmonary functions, respiratory failure and pulmonary hypertension, resulting in deterioration in quality of life, with increased morbidity and premature mortality.[5-8]

The incidence and prevalence of bronchiectasis are generally not well known and are underestimated in developing countries.[9]

Although the prevalence once declined over the past years in societies with high socioeconomic status, probably due to the development of preventive medicine, especially childhood immunizations, and improvement of the living conditions and widespread use of antibiotics, now a day bronchiectasis has been recognized more, mainly due to the frequent use of high end radiological examination like high-resolution computerized tomography (HRCT) scan.[10,11] Bronchiectasis can occur formerly childhood to late adulthood, but the average age in US, European, and Australian cohorts is between 60 and 70 years, and the incidence of bronchiectasis positively associated with age.[12,13] Geographical variation exists in etiology, incidence, prevalence and clinical features.[14-16] The most common cause of bronchiectasis is post-infection and other causes include chronic obstructive pulmonary disease (COPD), asthma, connective tissue disease and immunodeficiency.[14-16]

Bronchiectasis is a multidimensional disease, so its prognosis cannot be adequately determined by one isolated variable. Identifying patients at risk of exacerbations and mortality is vital to optimize their management. As described by Cole's "vicious cycle model, bronchiectasis is associated with microbiological colonization of airways with recurrent infections and chronic inflammation leading to impaired mucociliary clearance and progressive lung damage.[17]

Detection and characterization of bronchiectasis is the domain of thin-section computed tomography (CT). High-resolution CT (HRCT) with 0.6 to 1.5 mm slice thickness serves as a reference standard for imaging. However, pulmonary MRI has gained interest due to the possibility of functional imaging without radiation burden. Moreover, new technical developments overcome the limitations of low MR-signal and low spatial resolution. The radiological evaluation of bronchiectasis is based on definition published in the terms for thoracic imaging of the Fleischner Society: "Morphologic criteria on thin-section CT scans include bronchial dilatation with respect to the accompanying pulmonary artery (signet ring sign), lack of tapering of bronchi, and identification of bronchi within 1 cm of the pleural surface." The so-called signet ring sign is the primary sign for bronchiectasis representing a ring-shaped opacity, whereas the smaller adjacent artery stays for the signet. CT findings like the tree-in-bud sign and centrilobular opacity are linked to small airway disease with dilation and inflammation of the bronchiole or mucus plugging in its periphery.[18]

The aim of this study was to identify the underlying causes of bronchiectasis in a large cohort of adult patients that were referred to our department with a history and radiological picture suggesting a diagnosis of bronchiectasis. We also aimed to describe the main symptoms and signs in this group of patients in a stable state and examine the radio-logical extent of disease, the bacterial flora in the airways and the lung function data.

MATERIALS AND METHODS

A Hospital based observational prospective study done on sixty-seven confirmed patients suffering with bronchiectasis in TB & chest Hospital, Badi under Department of Respiratory medicine, R.N.T. Medical College, Udaipur, Rajasthan during one-year period. After applying Inclusion and Exclusion criteria, study population were selected.

Inclusion Criteria

- Patients who have known /suspected case bronchiectasis from any cause
- Subjects >15 years of age
- Patients who were admitted in this hospital.
- Patients who gave written informed consent.

Exclusion Criteria

- Patients who did not gave consent.
- Patients who are known case of cystic fibrosis or diagnosed as cystic fibrosis during study.
- Severely ill patients whether seropositive or seronegative.
- Patients with massive hemoptysis.
- Uncooperative patients.
- Severe co morbid medical condition.

Method: Patients who were referred or directly presented to out-patient's department with sign, symptoms and radiological examination suggestive of bronchiectasis were selected for this study. Patients presented with old records were reevaluated. A fresh chest x ray was done for reconfirmation. Those patients who were not having any records, new chest X-ray was done for confirmation. Patients were asked to get admission for treatment, if they were willing, we admit them in the respective ward and those refused for admission were not included in this study. After applying inclusion and exclusion criteria, patients were finally selected for this study. An informed written consent from the study populations were taken before commencement of this study. After admission demographic data like age, sex, residence etc were recorded. Past medical history like recurrent childhood and adulthood pulmonary infection or pneumonia, DM, HT, CAD, CVD, pulmonary or extra-pulmonary tuberculosis, history of COVID-19 infection, infertility, recurrent rhino-sinusitis were also recorded.

We also enquire about relevant drug history (corticosteroid, immunosuppressant drugs), history of ATT use, smoking history and occupational history. Other pulmonary conditions like ABPA, ILD, pneumoconiosis asthma, sarcoidosis and COPD were diagnosed by relevant clinical history and examination. Detailed cardinal lung symptoms (cough, expectoration, Dyspnea, wheeze, chest pain and hemoptysis) were asked and recorded. Constitutional symptoms like fever, weight loss, anorexia, malaise, fatigue night sweats were too recorded. General physical examinations were performed, and any positive findings were then recorded. A thorough systemic chest examination was also done and positive finding were recorded.

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Other systems were also examined and findings were recorded. Venous blood was drawn using universal precautions and routine blood investigations (CBC, FBS, LFT, RFT, HIV, HBsAg, HCV) were sent to central laboratory. Special blood investigation like total eosinophilic count, serum IgE, RA factor, ANA, SACE, ANCA were sent whenever indicated.

Chest X-rays (CXRs) at the time of admission was assessed by using the criteria outlined by Gudbjerg for the diagnosis of bronchiectasis; these criteria included the presence of increased pulmonary markings, honeycomb-like structures, atelectasis (loss of lung volume) and pleural changes. For radiographic progression, diagnosis and classification/types HRCT Thorax was advised to all patients from department of radiodiagnosis of this institute. HRCT finding were recorded and according to Reid classification it was grouped as cylindrical, varicose and cystic. Those patients who had more than one type of bronchiectasis grouped as mixed type of bronchiectasis.

Other associated CT finding like mosaic attenuation, loss of bronchial tapering, centrilobular nodules etc were also recorded. Lung function testing (spirometry) was performed with eligible candidate and according to ATS guideline it was grouped as obstructive, restrictive and mixed defect. Those patients presented as cor-pulmonale, relevant investigations like ECG, 2D-ECHO Study, serum NT-Pro BNP were sent. Cardiac consultations were too obtained for expert opinion. One morning sputum sample and one after one hour was collected in wide mouth container for AFB microscopic examination. Same sputum samples were preserved for CBNAAT examination to rule out active tuberculosis.

Another morning sputum sample were also collected in sterile container for gram stain and pyogenic culture sensitivity for bacterial isolation. Sputum for fungal KOH and fungal culture was sent whenever fungal lung infections were suspected. Those patients who were unable to expectorate, induction with 3 % saline nebulization was done. Chest physiotherapy too was used to expectorate. Initially patients were put on symptomatic treatment thereafter it was modified after receiving the investigations (culture & DST) reports. Patient's who had older chest X-ray were asked to produce for radiological comparison to ascertain the cause of bronchiectasis. Along with this clinical history, examination and relevant reports etiology of bronchiectasis were ascertained. Finally all the information was recorded in preformed performa for final analysis.

RESULTS

Our study showed that maximum number 44 (65.67%) of the patients were in below 60 years of age and 23 (34.33%) patient were above 60 year of age. most common age group 45-60 years (37.31%) had bronchiectasis. 52 (77.61%) were male and 15 (22.39%) were female and the male to female ratio was 3.47:1 [Table 1].

Maximum numbers 49 (73.13%) patients were underweight, 15 (22.39%) of the patients were normal weight and 3 (4.78%) patients were overweight according to WHO BMI classification [Table 1].

In our study maximum number 35 (52.24%) of the study population was current smoker followed by never smoker 24(35.82%) and former smoker 8 (11.94%). COPD was the most common associated lung disease in bronchiectasis patients and diabetic mellitus was the common non-pulmonary disease associated with bronchiectasis, followed by hypertension and cardiac disease [Table 1].

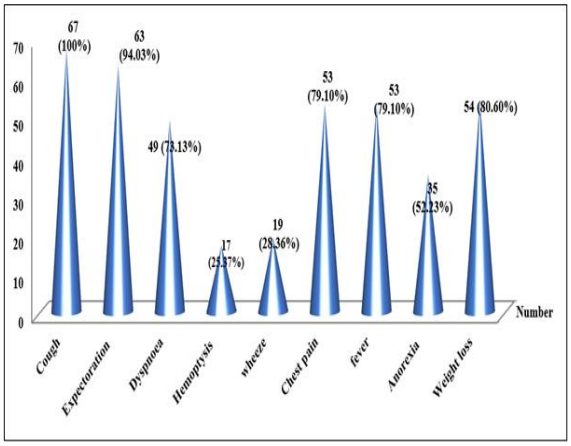

Figure 1: Distribution of study population according to presenting symptoms.

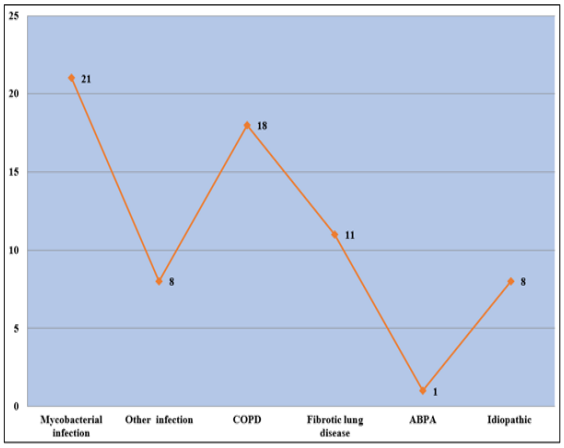

Figure 2: Distribution of study population according to etiology.

Almost all patients had cough and expectoration as presenting chest symptoms. Other chest symptoms were dyspnoea, hemoptysis, wheeze and chest pain seen in 49 (73.13%), 17 (25.37%), 19 (28.36%), 53 (79.10%) respectively. Weight loss, fever and anorexia were the most common constitutional presenting symptoms seen in 54 (80.60%), 53 (79.10%) and 35 (52.23%) respectively [Figure 1].

Most of the patients had mixed type of bronchiectasis on radiological examination. 17(25.37%), 10(14.93%) and 9(13.43%) patient had tractional,

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tubular and cystic bronchiectasis respectively. Most of the patients had bilateral bronchiectasis in radiological examination and upper zone were commonly involved. Mid zone was less frequent involved site in chest X-ray examination.13 (19.40%) had diffuse bronchiectasis [Table 2].

Most common cause of bronchiectasis was infective found in 29 (43.28%) patients among them mycobacterial etiology was found in 21 (31.34%) and other infection was found in 8 (11.94%) patients. Other etiological causes were COPD, Fibrotic lung disease and ABPA found in 18 (26.87%), 11 (16.42), 1 (1.49%) respectively. In eight patients no cause of bronchiectasis was ascertained [Figure 2].

Common organism detected in the sputum of study population was mycobacteria. other common pyogenic organism isolated from the sputum of study population was pseudomonas, followed by Klebsiella, S. Aureus, Ecoli and H. Influenza. Normal oral flora was detected in 10 (15.87%) patients whereas no bacteria were isolated in 23 (36.50%) patients [Table 3]. Maximum number of the patients had obstructive pattern in spirometric examination, 16 (37.21%) had restrictive pattern and 9 (20.93%) had mixed pattern [Table 4].

Table 1: Distribution of patients according to demographic variables.

Variables	Number (N=67)	Percentage
Gender		
Male	52	77.61%
Female	15	22.39%
AGE GROUPS (YEARS)		
15-30	2	2.98%
30-45	17	25.37%
45-60	25	37.31%
60-75	21	31.34%
>75	2	2.98%
BMI (Kg/M2)		
BMI <18.5	49	73.13%
BMI 18.5-24.9	15	22.39%
BMI ≥25.0	3	4.78%
SMOKING HISTORY		
Current smoker	35	52.24%
Former smoker	8	11.94%
Never smoker	24	35.82%
ASSOCIATED DISEASE		
COPD	18	47.36%
DM	8	21.05%
Hypertension	6	15.79%
Cardiac disease	5	13.16%
Bronchial Asthma	1	2.63%

Table 2: Distribution of study population according to radiological appearance.

Radiologic appearance	Number	Percentage %
Type of bronchiectasis		
Mixed pattern	31	46.27%
Tractional	17	25.37%
Tubular	10	14.93%
Cystic	9	13.43%
Distribution of bronchiectasis		
Unilateral	26	38.80%
Bilateral	41	61.19%
RUZ	25	37.31%
RMZ	10	14.93%
RLZ	12	17.91%
LUZ	24	35.82%
LMZ	7	10.45%
LLZ	11	16.42%
Diffuse	13	19.40%

Table 3: Distribution of study population according to organism isolated/ detected from sputum pyogenic culture and Microscopy. (N=63)

Type of bacteria	Number	Percentage
Pseudomonas	11	17.46%
S aureus	5	7.94%
E coli	4	6.35%
Klebsiella	7	11.11%
H. influenza	3	4.76%
Normal flora	10	15.87%
No growth	23	36.50%
Mycobacteria	24	38.09%

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Table 4: Distribution of study population according to spirometry findings. (N=43)

Spirometry findings	Number	Percentage
Obstructive disease	18	41.86%
Restrictive disease	16	37.21%
Mixed	9	20.93%

DISCUSSION

In present study out of 67 patients 52 (77.61%) were male and 15 (2.39%) female and male to female ratio was 3.47:1. This study was inconsistent with Mehmet Ali Habesoglu et al,[18] found 139 (45.7%) were male and 165 (54.3%) female. In Another study by Katerina Dimakou et al,[19] found 61% female and 39% male. In present study male patients were more than female because of Geo-graphical variation of diseases. In our study post tuberculosis, post infection and occupational lung disease patient were the major group of study population and these diseases are more common among male. This variation may be because male person do more outdoor activities in our region or in developing countries like India, women do not approach health facilities very easily due to socio economic restriction.

In present study maximum number 44 (65.67%) of the patients were below 60 years of age and 23 (34.33%) patient were above 60 year of age. This was consistent with one study by Katerina Dimakou et al,[19] found mean age of bronchiectasis was 60.5 years. Another study by Edmundo Rosales-Mayor et al,[20] the mean age of bronchiectasis was 65.3 years. Occurrence of bronchiectasis was early in our study. This may because, in most patients causes of bronchiectasis were post tuberculosis infection and fibrotic lung diseases like pneumoconiosis. In this part of Rajasthan both diseases are prevalent and occur in early age. Most of patients had history of smoking and exposure to occupational smoke and dust. These factors also may contribute for development of bronchiectasis in the early age.

A study conducted by Mohd Iskandar Jumat et al,[21] from Malaysia, their study showed occupational lung diseases or work-related lung diseases are lung conditions caused or made worse by materials when a person is exposed to irritants in the work place. Some of the commonly reported occupational lung diseases will be discussed, such as occupational asthma, silicosis, smoking of tobacco product COPD and bronchiectasis more prevalent. Asbestos linked disease, and farmers' lung disease. They contribute toward global health and economic impacts worldwide. In present study, most of the person related to farming, mining, construction work and labor work in factory. Exposure to dust damages the alveolar macrophages causes defect in local immunity after that lung infections (tubercular or non-tubercular) are more common that ultimately leads to bronchiectasis change. Sometime mineral dust damages the lung parenchyma and after healing bronchiectasis develops mainly tractional bronchiectasis. they are more prone to developing occupation related disease and bronchiectasis.

In present study Maximum numbers 49 (73.13%) of the patients were normal weight according WHO BMI classification. 15 (22.39%) patients were underweight and 3 (4.78%) patients were overweight. A study conducted by Bumhee Yang et al22 found that the underweight category (HR 1.35, 95% CI 1.29–1.42) still had a higher risk of bronchiectasis development than the normal weight population; in contrast, overweight (HR 0.82, 95% CI 0.79–0.85), obesity (HR 0.81, 95% CI 0.78–0.85), and severe obesity categories (HR 0.76, 95% CI 0.70–0.82) had a lower risk of bronchiectasis development than the normal weight population. Another study conducted at department of Respirology, Qilu Hospital of Shandong University, Jinan, Shandong Province, China 23 they observed the number of patients in the 4 study groups were as follows: underweight group, 97 patients (28.61%); normal weight group, 173 patients (51.03%); overweight group, 55 patients (16.23%); and obese group, 14 patients (4.13%). Comparisons of the demographic data and clinical variables among the four groups are reported. The following variables were significantly different among the four groups: total symptom duration in years in the underweight group was significantly higher than those in the normal weight and overweight groups. So above mentioned study also favor the occurrence of bronchiectasis in normal /low BMI population with increase the disease severity. Most of the populations in our study were from rural area and their poor socio-economic background with engaged in farming or labor work, so malnutrition and low BMI is very common and more vulnerable to bronchiectasis and its severity.

In present study maximum number 35 (52.24%) of the study population was current smoker followed by never smoker 24(35.82%) and former smoker 8 (11.94%). This was consistent with other studies like in study by Katerina Dimakou et al,[19] found non-smoker 61% and smoker 39% having bronchiectasis. Another study conducted to see the association between Smoking Status and Incident non-cystic fibrosis bronchiectasis in young adults by Bumhee Yang et al,[24] found that the association of smoking with incident bronchiectasis was more prominent in females, younger individuals (20–29 years). Bronchiectasis development was significantly increased in ex-smokers (adjusted hazard ratio (aHR) in the Model 3 = 1.07, 95% CI 1.03–1.13) and current-smokers (aHR = 1.06 in the Model 3, 95% CI = 1.02–1.10), with the highest HR in ≥10 PY smokers (aHR in the Model 3 = 1.12, 95% CI = 1.06–1.16). However, the HR was not increased in <10 PY current smokers when compared to never-smokers (aHR in the Model 3 = 1.03,95% CI = 0.98–1.07. In present study population, majority of patients were

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current smoker and doing more outdoor activity like farming, occupational working. Smoking gave sense of wellbeing while doing work or smoking habit developed as a peer effect. Environmental pollution is also a confounding factor for development of bronchiectasis.

COPD was the most common 18 (47.36%) associated lung disease in bronchiectasis patients and cardiac disease was the common non-pulmonary disease associated with bronchiectasis, followed by hypertension and Diabetic mellitus. A study conducted by Mehmet Ali Habesoglu et al.18 University Medicaland Research Center, Istanbul, Baskent University Hospital, Ankara, Turkey the COPD and asthma were frequently observed in patients with bronchiectasis. Asthma or COPD were the comorbidities in 17.8 and 18.4% of our patients, respectively an underlying etiology was identified in 52.6% of the patients. Most commonly bronchiectasis was post-infectious (49.7%) due to childhood infections (22.7%), tuberculosis (15.5%) and severe pneumonia (11.5%).

In present study, most common associated lung condition was COPD as most of the patients were current smoker which is most common risk factor for this chronic debilitation disease. Diabetic mellitus was the other common non pulmonary disease. Diabetic mellitus is a well-documented risk factor for tuberculosis and other pulmonary bacterial and fungal infection which subsequently convert into bronchiectasis.

A study conducted by Mehmet Ali Habesoglu, et al,[18] from University Medical and Research Center, Istanbul the predominant symptoms were productive cough (83.6%), dyspnea (72%), and hemoptysis (21.1%). Our study was consistent with the other study available in the literature.

In present study, most of study population had past history of tuberculosis, infection and fibrotic lung disease. Because of presence of these conditions, clubbing was common in this study. Chronic debilitating condition due to poor nutritional state in this part of Rajasthan may be the responsible factor for the pallor.

In present study, most of the patients had mixed type of bronchiectasis on radiological examination. 17 (25.37%), 10 (14.93%), 9 (13.43%) patient had tractional, tubular and cystic bronchiectasis respectively. It was inconsistent with study conducted by Mehmet Ali Habesoglu et al,[18] found that the most common types of bronchiectasis were cylindrical in 47%, varicose in 9.9%, cystic in 45.1%, and multiple types in 24.3%. Involvement was multi-lobar in 75.3% and bilateral in 62.5%. Nadia Sharif, et al,[25] found that upper lobe predominant disease pattern was found in majority of patients (41.8%, n = 82) with 24% (n = 47) had bilateral upper lobe involvement (BUL) and 17.9% (n = 35) had unilateral upper lobe (UUL) bronchiectasis. The other radiological distributions were: Diffuse bilateral bronchiectasis (DBB) found in 20.4% (n = 40), diffuse unilateral bronchiectasis (DUB) in 15.8% (n = 31), bilateral lower lobe (BLL) in 12.2% (n = 24), unilateral lower lobe (ULL) in 8.2% (n = 16), both middle lobe and lingula involvement (ML&L) in 1% (n = 2) and isolated middle lobe (ML) in 0.5% (n = 1).

In present study, most patients had bilateral upper lobe bronchiectasis and mixed pattern of bronchiectasis in X-Ray chest and HRCT Thorax which is consistent with the study by Nadia Sharif, et al.[25] This pattern of bronchiectasis may be because the most patients in our study had post tuberculosis and pneumoconiosis. Both diseases predominantly affect upper zone of the lung so upper lobe bronchiectasis were common in our study.

In present study, most common cause of bronchiectasis was infective found in 29 (43.28%) patients among them mycobacterial etiology was found in 21 (31.34%) and other infection was found in 8 (11.94%) patients. Other etiological causes were COPD, fibrotic lung disease (pneumoconiosis, CTD-ILD etc) and ABPA found in 18 (26.87%), 11 (16.42), 1 (1.49%) respectively. In eight patients no cause of bronchiectasis was ascertained.

Another study conducted by Mehmet Ali Habesoglu,[18] most common, bronchiectasis was post-infectious (49.7%) due to childhood infections (22.7%), tuberculosis (15.5%) and severe pneumonia (11.5%). There were five patients with immotile cilia syndrome, two patients with immunoglobulin deficiency and two single cases with allergic broncho pulmonary aspergillosis and congenital broncho esophageal fistula. At the time of assessment, some patients were previously diagnosed with chronic obstructive pulmonary disease (COPD) (18.4%) or asthma (17.8%).

In present study is consistent with the study by Nadia Sharif, et al,[25] and Mehmet Ali Habesoglu el al,[18] post-tuberculosis bronchiectasis and fibrotic lung disease (pneumoconiosis) is recognized sequelae of the tuberculosis because firstly, in this part of Rajasthan pulmonary tuberculosis is common secondly this zone had mining area people worked in these mining exposed to mineral dust and subsequently developed pneumoconiosis if necessary preventive measure not taken, later on developed tuberculosis and post-TB bronchiectasis.

Common organism detected in the sputum of study population was mycobacteria. Other common pyogenic organism isolated from the sputum of study population was pseudomonas, followed by Klebsiella, S. Aureus, E.coli and H. Influenza. Normal oral flora was detected in 10 (15.87%) patients whereas no bacteria were isolated in 23 (36.50%) patients.

It was consistent with study by Edmundo Rosales-Mayor et al,[2] observed 50 patients (27.5%); Pseudomonas aeruginosa (PA) being the most frequent 38 (20.9%) followed by Haemophilus influenzae 13 (7.1%), Moraxella catarrhalis 3 (1.6%) and Staphylococcus aureus 3 (1.6%).

In present study, tuberculosis was the most common bacteria isolated because most patients had history of

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tuberculosis so detection may be because of reactivation or reinfection as defect in local immunity. Second common bacteria were pseudomonas as in chronic bronchiectasis pseudomonas is the common bacterial pathogen as per the literature. This finding is consistent with the study describe above.

In present study, maximum number of the patients had obstructive pattern 18 (41.46%) in spirometry, 16 (37.21%) had restrictive pattern and 9 (20.93%) had mixed pattern.

A study conducted by Mehmet Ali Habesoglu1 et al,[18] they analyzed Spirometric measurements of 274 patients. The test was normal in 59 patients (21.5%), obstructive in 128 (46.7%), restrictive in 22 (8%), and mixed in 65 (23.7%) patients. FEV1 and FVC values of patients with cystic type were lower than the values of those with non-cystic type bronchiectasis. Additionally, a mixed pattern was detected more commonly in the cystic group.

Another study conducted by Edmundo Rosales-Mayor et al from Barcelona.[2] In overall Spirometric patterns, 104 (67.5%) patients had an obstructive (FEV1/FVC<70%) and 24 (13.2%) patients had a severe airflow limitation (FEV1<50%). Our finding is consistent with both study. In present study population, most of common associated disease was COPD which is an obstructive lung disease so obstructive pattern in spirometry is obvious in this study. Good number of the patients had history of pulmonary tuberculosis and these patients may have secondary COPD as a respiratory complication of pulmonary tuberculosis which may show obstructive pattern in spirometry. Because of these two factors obstructive pattern is more common in this study.

CONCLUSION

In this study the most common etiology for bronchiectasis was the post Tuberculosis infection. Prompt diagnosis and early initiation of anti-tuberculosis drugs should be started as early as possible to prevent this catastrophic condition to prevent chronic morbidity. Sputum AFB examination or other genotypic testing for tuberculosis should be advised to post tuberculosis patient to rule out reactivation or reinfection of tuberculosis as most common infection in present study was tuberculosis. Apart from tuberculosis, pseudomonas was the common pyogenic organism isolated from bronchiectasis patients. so sputum for pyogenic culture and sensitivity should be sent and appropriate treatment should be started.

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