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Clinico-Spirometric Profile of Bronchiectasis Patients Presenting to Tertiary Care Centre, Dhiraj Hospital, Vadodara, Gujarat

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Keywords:
Bronchiectasis, spirometry, clinical profile.

Abstract
INTRODUCTION:
Bronchiectasis is a chronic, unrestrained dilatation of the subsegmental airways[1]. The bronchiectasis patient group is highly varied, with a range of diseases with various aetiologies and varying clinical, radiological, and microbiological features[2]. It is unknown how often bronchiectasis is. The condition is extremely understudied, especially in our region of the world[3]. High resolution CT (HRCT) scanning has evolved into the gold standard for bronchiectasis diagnosis[4]. To evaluate the functional impact of bronchiectasis-related deterioration, pulmonary function tests are employed. On a pulmonary function test, obstructive impairment (i.e., decreased FEV1, low FVC, and low FEV1/FVC ratio) is most often observed[5].For the same reason, we discover various and unique clinical profiles in BRONCHIECTASIS patients.
AIM: To build a clinico-spirometric profile of diagnosed BRONCHIECTASIS patients presenting to a tertiary health care centre in Vadodara.

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METHODS: This observational cross sectional study was conducted at Respiratory Medicine department for total duration of 18 months.This study included 75 patients with bronchiectasis. Each patient had undergone a thorough evaluation of their history followed by clinical examination and spirometry.

RESULTS: There were 75 patients in total. 59% of the population, who were men and were 48.84+/-15.470 years of mean age, had never smoked. The most common symptom was cough with expectoration(82%) followed by dyspnea(60%) followed by chestpain(32%). The most frequent recognised cause of bronchiectasis was Post-TB. The respective mean values for FEV1, FVC, and FEV1/FVC were 51.58, 63.07, and 71.78. The pulmonary function test results for the 75 patients showed 12% with normal results, 21.33% with restrictive, 22.67% with mixed, and 44% with obstructive patterns. As compared to other patterns on spirometry, mixed type pulmonary function impairment was more commonly seen.

CONCLUSION:One of the main underlying disease processes that have been found in our area leading to bronchiectasis is Tuberculosis. Most patients presented with cough with expectoration followed by dyspnea. Patients with bronchiectasis in our region are observed to frequently have mixed pulmonary function abnormalities.

1. Introduction:

Bronchiectasis is a chronic, unrestrained dilatation of the subsegmental airways[1].

The damage is thought to be predominantly caused by the effects of neutrophil inflammatory products. These chemicals are released when a bacterial infection takes place, and research shows that the inflammatory response may still be activated even when there aren't any exacerbations of the illness[6,7].

Neutrophil proteases and cytokines associated with macrophages may have pro-inflammatory qualities that contribute to lung damage between exacerbation times[8,9].

The bronchiectasis patient group is highly varied, with a range of diseases with various aetiologies and varying clinical, radiological, and microbiological features[2].

It is unknown how often bronchiectasis is. The condition is extremely understudied, especially in our region of the world[3].

High resolution CT (HRCT) scanning has evolved into the gold standard for bronchiectasis diagnosis[4]. To evaluate the functional impact of bronchiectasis-related deterioration, pulmonary function tests are employed.

On a pulmonary function test, obstructive impairment (i.e., decreased FEV1 and low FEV1/FVC ratio) is most often observed[5]. For the same reason, we discover various and unique clinical profiles in BRONCHIECTASIS patients.

2. Material and Methods:

After getting approval from the institutional ethics committee, an observational cross sectional study was conducted at Dhiraj General Hospital, SBKSMIRC, Pipariya,Vadodara.

- Study Period: 18 months.
- Sample size: 75

Their clinical information and spirometry results were entered and grouped on an excel file. Spirometrical pattern was analysed and categorized.

INCLUSION CRITERIA:

1.Patients diagnosed with BRONCHIECTASIS.

2.Patients who underwent spirometry.

3.Patients willing to give consent.

EXCLUSION CRITERIA:

1.Patients with active tuberculosis.

2.Patients under 18 years of age.

STATISTICAL ANALYSIS:

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Utilising, SPSS software version 20.0, data were gathered, tabulated, coded, and then analysed. Data were presented as frequency, mean ±standard deviation, wherever necessary. Spirometry patterns and clinical characteristics were also depicted.

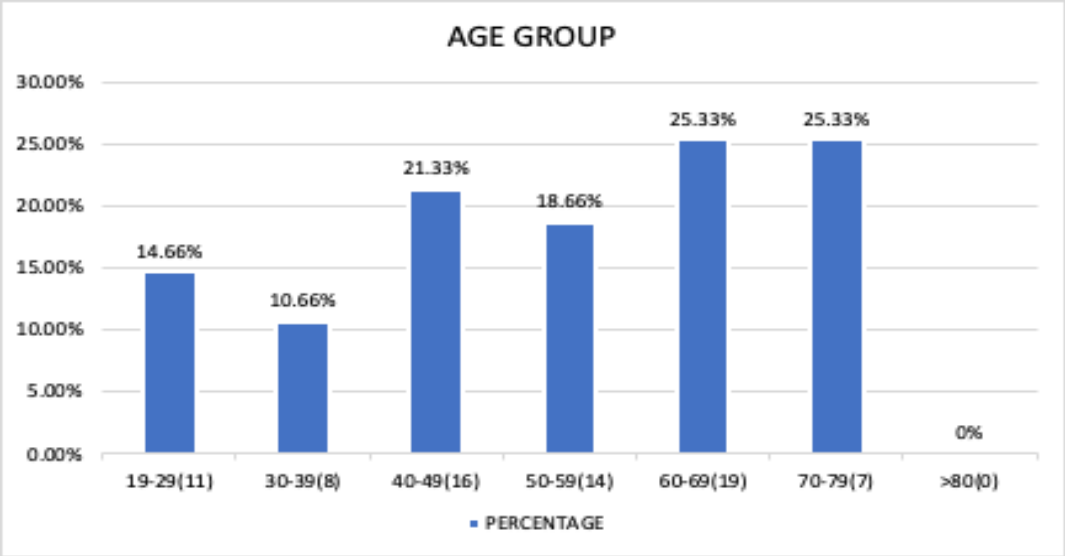
The study comprised a total of 75 bronchiectasis patients. 57.33% of the population were men, indicating a male preponderance. The patients were 48.84 ± 15.47 years old on an average (range 19-80 years).

3. Results:

TABLE-1 DISTRIBUTION OF PATIENTS ACCORDING TO SEX

Gender	PERCENTAGE
Male	43 (57.33%)
Female	32 (42.67%)

Figure-1 Bar Diagram Showing the Distribution Of PatientsAccording To Age



Out of a total of 75 patients, 19 (25.33%) were in the 60–69 age range, as shown above. It was studied that it can present at any age group

Table-2 Smoke Exposure of the Patients

Smoke-Exposure	
Never smoker	44 (59%)
Ex-smoker	14 (19%)
Current smoker	7 (9%)
Chulha exposure	10 (13%)

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We found that thirty-one out of 75 patients with a history of smoke exposure (41%), 9% were current smokers at the time of presentation. 44 (59%) were never smoker & 10 (13%) had history of chulha exposure.

Table-3 Symptom Presentation in Bronchiectatic Patients

Symptoms	
Cough	**65 (86.67%)**
Expectoration	**58 (77.33%)**
Dyspnea	**60 (80.00%)**
Chest Pain	**32 (42.67%)**
Loss of Weight	**22 (29.33%)**
Loss of Appetite	**24 (32.00%)**
Fever	**17 (22.67%)**
Hemoptysis	**13 (17.33%)**

In this study we have found that most common presenting symptom was cough (86.67%) followed by shortness of breath (80%) & expectoration (77.33%). Around 30% patients had complaint of weight loss & appetite loss.Only 17.33% had hemoptysis as a presenting complaint.

Figure-2 Presenting Symptoms In Bronchiectasis Patients

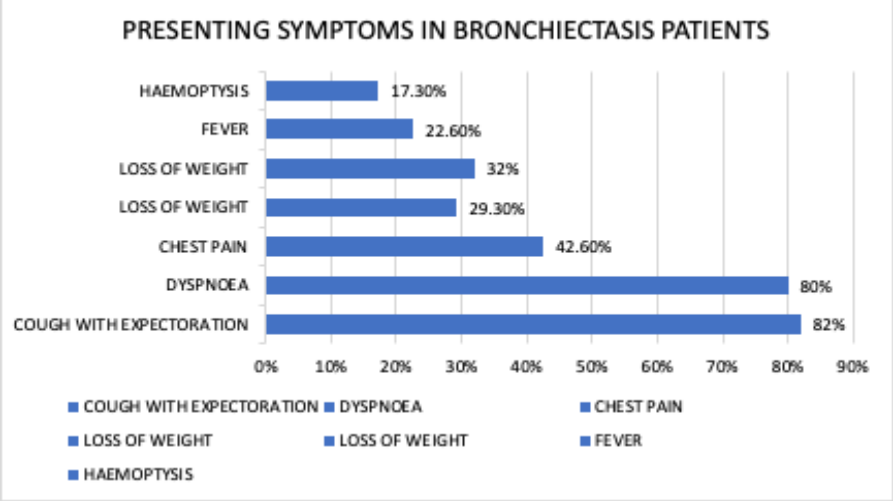

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Table-4 Pattern of Spirometry in the Study.

PATTERN	NUMBER	PERCENTAGE
MIXED	33	44%
OBSTRUCTIVE	16	21.3%
RESTRICTIVE	17	22.7%
WITHIN NORMAL LIMITS	9	12%
TOTAL	75	100%

Figure-3 Pattern of Spirometry in the Study

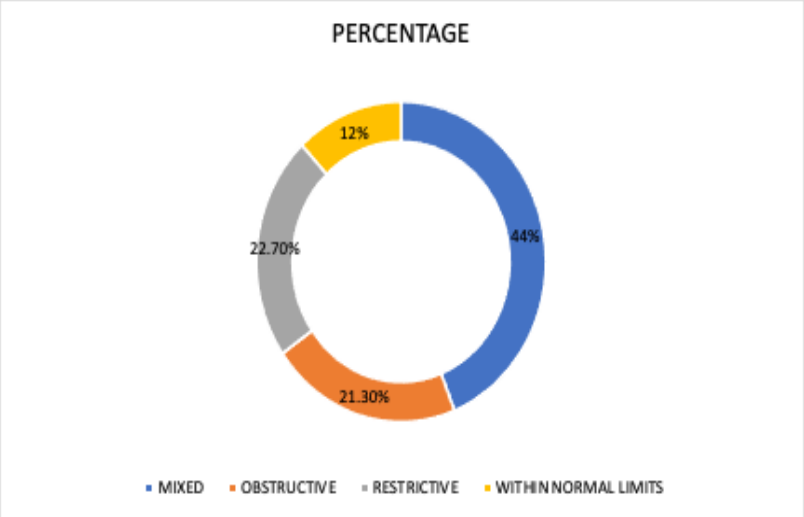

Table-5 Severity Of Obstruction Based On Fev1 In Patients Having Obstructive And Mixed Pattern

FEV1	N	PERCENTAGE
MILD	4	8%
MODERATE	15	30.6%
SEVERE	15	30.6%
VERY SEVERE	15	30.6%

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Figure-4 Severity of Obstruction Based on Fev1 In Patients Having Obstructive And Mixed Pattern

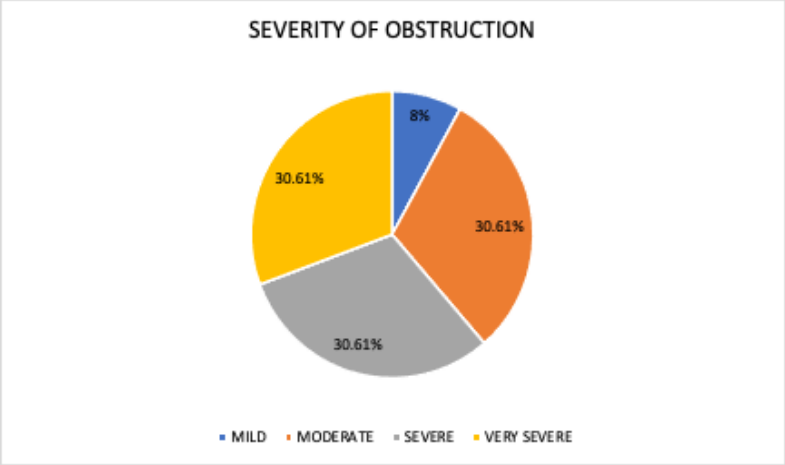

Table-6 Severity of Restiction Based on Fvc in Patients Having Restrictive & Mixed Pattern.

FVC	N	PERCENTAGE
MILD	6	12%
MODERATE	9	18%
MODERATELY SEVERE	14	28%
SEVERE	16	32%
VERY SEVERE	5	10%

Fugure-5 Severity of Restiction Based on Fvc in Patients Having Restrictive & Mixed Pattern.

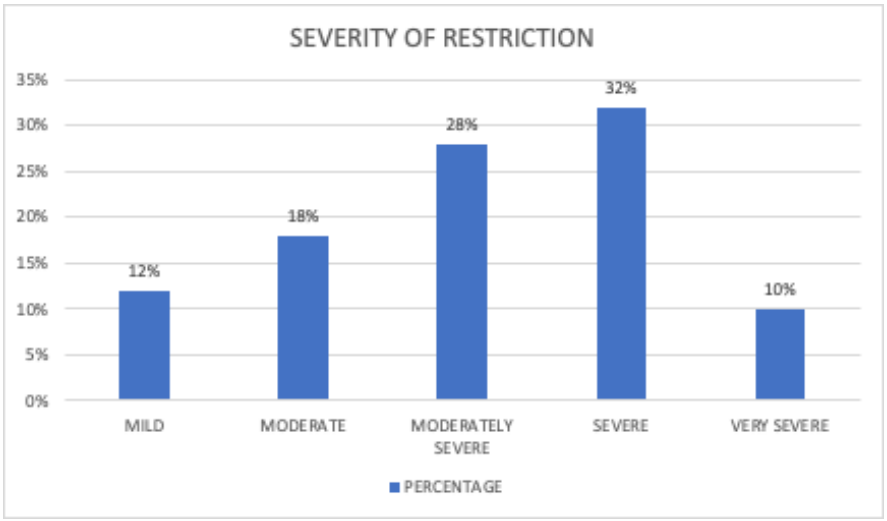

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TABLE-7 Association Between Clinical Features and Spirometry Pattern

SYMPTOMS	MIXED		RESTRICTIVE		OBSTRUCTIVE		P VALUE
	N	%	N	%	N	%	
COUGH	29	38.7%	16	21.3%	13	17.3%	0.716
EXPECTORATION	26	34.7%	16	21.3%	10	13.3%	0.147
DYSPNEA	30	40%	15	20%	2	2.7%	0.001
CHEST PAIN	14	18.7%	4	5.3%	12	16.0%	0.012
LOSS OF WEIGHT	9	12%	4	5.3%	5	6.7%	0.715
LOSS OF APPETITE	9	12%	6	8%	6	8.0%	0.881
FEVER	11	14.7%	3	4%	2	2.7%	0.260
HAEMOPTYSIS	6	8%	2	2.7%	2	2.7%	0.522

In this study, every symptom presentation was most common with mixed pattern on spirometry. For dyspnea & chest pain p value is < 0.05 which is significant. So these both symptoms were more common with mixed type of pattern.

4. Discussion:

In this study there were 75 patients in total. 59% of the population, who were men and were 48.84+/-15.470 years of mean age, had never smoked. The most common symptom was cough with expectoration(82%) followed by dyspnea(60%) followed by chestpain(32%). The respective mean values for FEV1, FVC, and FEV1/FVC were 51.58, 63.07, and 71.78. The pulmonary function test results for the 75 patients showed 12% with normal results, 21.33% with restrictive, 22.67% with mixed, and 44% with obstructive patterns.As compared to other patterns on spirometry, mixed type pulmonary function impairment was more commonly seen.

In this study, cough with expectoration(82%) is the most common symptom followed dyspnoea (80%) which is similair to the following studies.In MB Nicotra et al study 90.2% presented with cough with expectoration followed by dyspnea(71.5%)[10]. In utpat et al study 100% had cough with expectoration followed by dyspnea (92%)[11], K.Dimakou et al study cough with expectoration (81%) followed by dyspnea(60%)[12].In alzeer et al study , cough with expectoration (78.5%) followed by haemoptysis(29.9%)[13].In sundarajaperumal et al study

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cough with expectoration follwed by dyspnoea are the most common symptoms[15].

Mean age in this study was 48.84+/-15.470 years and this study had male predominance of 57.33%.while mean age in utpat et al study mean age was 34.8 more common in males[11]; while in nishant et al study mean age of 48.16 with male predominance[14] was seen.

The pulmonary function test results for the 75 patients showed 12% with normal results, 21.33% with restrictive, 22.67% with mixed, and 44% with obstructive patterns.In Dimakou K et al study on 277 patiens,43.1% (85) had obstructive pattern followed by 38%(75) had normal pattern followed by 11.1%(22) mixed and 7.6%(15) patients had restrictive pattern[12].In Tiwari et al study ,out of 100 patients, mixed involvement on spirometry was the most frequent pattern (41%), followed by obstructive involvement (38%), whereas the remaining cases (10% and 11%, respectively) had restricted activity and a normal spirometric pattern[14].Sundrarajaperumal, A., et al Study Spirometry distribution pattern demonstrating 14 percent of patients had normal spirometry, 64 percent had obstructive patterns, 15 percent had restrictive patterns, and 7 percent had mixed patterns[15].

5. Conclusion:

Bronchiectasis has a wide range of aetiologies and clinico-radiological patterns, making it diverse. In India, where the prevalence of TB is increasing, bronchiectasis may be one of the main ongoing causes of death and morbidity. The most typical signs of the condition include dyspnea, crepitations, and a long-lasting productive cough. In our region, patients with bronchiectasis typically display mixed patterns on spirometry.Therefore, a pulmonologist should be aware of the clinical and Spirometry results in bronchiectasis patients for an accurate diagnosis and adequate multimodality treatment since early treatment improves prognosis of the illness & promotes quality of life. Early spirometry therefore contributes to morbidity and a better prognosis in bronchiectasis patients.

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