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Original Research Article

COMPARISON OF SOCIODEMOGRAPHIC, CLINICAL AND SPIROMETRIC VARIABLES OF COPD AND COPD WITH BRONCHIECTASIS SUBJECTS

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ABSTRACT

Background: Chronic Obstructive Pulmonary Disease (COPD) is a worldwide public health challenge because of its high prevalence and related disability and mortality. World Health Organisation projections predict that COPD-related mortality and disability will continue to increase worldwide until at least 2030. The objective is to compare COPD and COPD's sociodemographic, clinical and spirometric variables with bronchiectasis subjects.

Materials and Methods: The present study is a prospective cohort study. This study was conducted in 1 year, from September 2022 to July 2023, at the Department of Respiratory Medicine, SHKM GMC, Nalhar. A total of 50 patients were included in this study.

Results: 42% of subjects were between age groups 61-70, with a mean age (64.98±9.52. 68% of subjects were male and 32% female. 24% of subjects were never smokers, and 76% were current or former smokers. Among smokers, 62.8% of subjects had smoked more than five packs of cigarettes. H/O exacerbation is present in 64%, the CAT score was greater>20 in 64%, and MMRC 3/4 in 52% with comorbidity in 70% of cases; 30% of the population died in the 6-month follow-up period.

Conclusion: The association of the following variables between COPD and COPD-BE and reveal statistically significant differences: History of TB, Daily sputum volume, Age, Smoking pack years, ph, PCO2, HCO3, and CAT score. FEV1, FVC, FEV1/ FVC and PEF (25 – 75) %.

Keywords: Chronic Obstructive Pulmonary Disease (COPD), COPD with Bronchiectasis.

INTRODUCTION

Bronchiectasis was previously considered to be an orphan disease, but the progressive rise of incidence and mortality in these cases, and the advent of new imaging and diagnostic methods have resulted in more research and the emergence of strategies for new therapies around the world.

Acute exacerbation of COPD (AECOPD), defined as the sudden worsening of respiratory symptoms and requirement of additional clinical treatment, tends to be a critical factor leading to poor outcomes. Exacerbation of COPD reduces lung function and quality of life, and is accompanied by an increased disease-related burden and high hospital costs mortality. [1-3]

In addition, 4–72% of patients with severe COPD are found to have radiological bronchiectasis on computed tomography, with similar frequencies (20–30%) now being reported in cohorts with severe or uncontrolled asthma. Co-diagnosis of bronchiectasis with another airway disease is associated with increased lung inflammation, frequent exacerbations, worse lung function, and higher mortality.[4]

Furthermore, chronic mucus hypersecretion in COPD or chronic bronchitis has been identified as a risk

factor for COPD exacerbation.[5] However, the symptoms of cough and phlegm production are common in bronchiectasis. Bronchiectasis causes permanent destruction of the bronchi and is associated with increased sputum production and susceptibility to infectious complications.[5,6] Bronchiectasis combined with COPD has been recognised as a COPD phenotype. However, the prevalence of bronchiectasis in Thai COPD patients is unknown.[7] Specific lung structural abnormalities, including bronchiectasis, predict meaningful clinical outcomes of COPD.[8-10] Hence, this study was conducted to compare sociodemographic, clinical and spirometry variables of COPD and CDPD with bronchiectasis subjects.

MATERIALS AND METHODS

The present study is a prospective Cohort conducted in the Department of Respiratory Medicine at Shaheed Hasan Khan Mewati (SHKM) Government Medical College, Nalhar, Nuh. Over 12 months, all the patients with COPD admitted to the Department of Respiratory Medicine, both stable and exacerbation subjects, were recruited for this study.

Sample Size: In-hospital study with a minimum of 50 patients for the study

Inclusion Criteria

- All patients diagnosed with COPD and Bronchiectasis according to the "ROSE" acronym (Radiology, Obstruction, Symptoms, Exposure) – a Delphi consensus definition of the association of COPD and Bronchiectasis by the EMBARC Airways Working Group.
- Exacerbation is defined as an acute worsening of respiratory symptoms that results in additional therapy.
- Patients aged between 40-85 years old.

Exclusion Criteria

- Coexisting respiratory disease, i.e. Tuberculosis, Pneumothorax and Lung cancer.
- Inability to perform spirometry, or being too physically ill or mentally incapacitated to participate.
- Unstable coronary artery disease
- Significant neurological disease
- History of radiation therapy to the chest or breast.
- The patient has a drug allergy to albuterol.
- Pregnant female

Study Tool

- Pretested and validated data collection Tool/Schedule, General and Respiratory system assessment
- Symptoms
- CAT (COPD Assessment Test)
- mMRC (Modified Medical Research Council Dyspnoea)
- Chest X-ray PA
- ECG (Electrocardiography)
- Spirometry
- HRCT Thorax (High-Resolution Computed Tomography)
- Sputum specimen/induced sputum specimen
- BAL (Broncho alveolar lavage) specimen
- Other allied instruments are required during the physical examination of the patient.

Methodology

This prospective, single-centre cohort study enrolled patients with COPD who were followed up for 6 months. The study was approved by the institutional ethical committee, SHKM GMC, Nalhar. The patients were diagnosed with COPD confirmed by chest HRCT, which was performed by 1 radiologist and 1 pulmonologist. Apart from Demographic, clinical data and pulmonary function tests, the following variables were included: sex, age, weight, height, dyspnea scale [modified Medical Research Council], number of emergency room visits, secretion volume and appearance, presence of hemoptysis, number of exacerbations, hospitalization in the previous year, aetiology, number of lung lobes affected on chest HRCT, use of oxygen therapy, infectious agents in culture, smoking, comorbidities, history of pulmonary tuberculosis, previous surgery/thoracic resection, vaccination for influenza and pneumococcus and practice of respiratory physiotherapy. Patients with COPD were classified into 2 groups: a group of survivors (GS) and a group of patients who died (GD) after a 6-month follow-up period

Comorbidities were systematically recorded through direct questioning. The diagnosis of a comorbidity was confirmed by either reviewing the patient's medication list or, when feasible, by confirmatory tests available from their medical records. Conditions that had completely resolved were excluded (i.e., pneumonia).

Statistical Analysis: For statistical analysis, data were entered into a Microsoft Excel spreadsheet and then analysed by SPSS (version 21.0; SPSS Inc., Chicago, IL, USA). Data had been summarised as mean and standard deviation for numerical variables and count and percentages for categorical variables.

RESULTS

The distribution of age group reveals that several subjects in the age group (in years) of < 50 is 4 (8%), 51-60 is 10 (20%) & 61-70 is 21 (42%). Gender distribution of subjects reveals that Males are 34(68%) & Females are 16(32%). Group distribution of subjects based on type of disease shows that 18 (36%) are COPD, COPD with Bronchiectasis in 32 (64%) subjects. The distribution of smoking status reveals that the number of subjects of smoking status in current smokers is 15 (30%), former smokers, 23 (46%) and never smokers, 12 (24%). The distribution of smoking status based on several smoking pack years reveals that subjects with zero pack years are 5 (11.6%), three pack years are 1 (2.3%), four-pack

years are 10 (23.3%) & five pack years are 27 (62.8%).

History of (H/O) Allergic reactions are present in 2 (4.0%) & absent in 48 (96.0%) subjects. Cough is present in 46 (92%) & expectoration is present in 49 (98%) subjects. Symptoms of cough are present for more than 2 months in 36 (76.6%) subjects. Consistency of sputum with Mucoid is in 32 (64%) subjects, Mucopurulent in 16 (32%), and Purulent/Sanguinous in 1 (2%). Sputum is Odourful in 5 (10%) subjects and Odourless in 45 (90%). Breathlessness, Chest Tightness & haemoptysis are present in 44 (88%), 6 (12%) & 6 (12%) subjects, respectively. History of previous exacerbation is present in 32 (64%) & absent in 18 (36%) subjects, with exacerbation frequency per year being <2 episodes in 21 (64.6%), & >2 episodes yearly in 10 (32.2%). History of Invasive Ventilation & hospital admission is present in 5 (10%) & 15 (30%) subjects, respectively.

The distribution of sputum microbiology reveals that the number of subjects with Potential Pathogenic Organism (PPM) as Pseudomonas Aeruginosa detected in sputum/ BAL is 2 (4%), and positive Fungal culture and sensitivity in 2 (4%). Microscopy for acid-fast bacilli and CBNAAT for M. detected negative results in all. The distribution of sputum microscopic examination reveals that isolation of Pseudomonas in the last two years is 2 (4%), and Unknown is 24 (48%). History of use of both nebulised steroids & oral or intravenous antibiotics is absent in 24 (48%), present in 2 (4%), and Unknown in 24 (48%).

Assessment of symptom scoring reveals that CAT score(< 20) Group 0 is 17 (34%) and CAT score(> 20) Group 1 is 33(64%), MMRC Grade 0 is 1 (2%), Grade 1 is 11 (22%), Grade 2 is 12 (24%), Grade 3 is 21 (42%), Grade 4 is 5 (10%). Comorbidity is present in 70% of cases (35 subjects) with the following details of prevalence: Bronchiectasis (22%), Bronchiectasis with Respiratory failure (2%), Coronary Heart Disease(2%), Hypertension(4%), Hypertension with Coronary Heart Disease(4%), Kidney Disease(CKD) (2%), Respiratory failure(12%), Chronic Liver Disease(CLD) with Bronchiectasis(2%), Diabetes mellitus with Respiratory failure (4%), Bronchiectasis with Respiratory failure (10%), Bronchiectasis and Diabetes with respiratory failure (4%), hypertension & bronchiectasis with respiratory failure(4%), hypertension. Patients were advised to attend pulmonary rehabilitation, it was attended by 13 (26%) and 37 (74%) patients failed to attend.

Distribution of frequency of subjects with presence of a history of the following medications: Steroids/Long-acting beta agonist 22 (44%), Leukotriene receptor antagonist 26 (52%), Long-acting anti-muscarinic 27 (54%), Long-acting beta agonist 27 (54%), Oral corticosteroids 9 (18%), Mucolytic 27 (54%), Nebulised bronchodilators 27 (54%), Inhaled/Nebulised/oral antibiotics 1 (2%), Long term oxygen therapy 3 (6%), (>28days) Oral antibiotics in 2 (4%), Pneumonia 2 (4%), Anti-Tubercular drug in 20 (40%).

Radiological Findings of Cystic bronchiectasis present in 2 (6.3%), Cystic and Tractional in 1 (3.1%), and Tractional in 29 (90.6%). Subjects were divided into Group COPD 18 (36%) and COPD with Bronchiectasis 32(64%). Subjects were classified into 2 groups: a group of survivors (GS) and a group of patients who died (GD) after a 6-month follow-up period. The outcome was GD in 15 (30%) & GS in 35 (70%).

Table 1: Distribution of mean age

	Number	Mean	SD
Age (years)	50	64.98	9.52
Pack years of smoking	38	36.44	14.37
S Urea	50	35.72	24.87
S Creatinine	50	0.87	0.29
Sodium	50	138.93	4.55
Potassium	50	4.20	0.66
ALK	50	101.66	35.95
Random Blood Sugar	50	142.30	49.91
Total Bilirubin	50	0.5120	0.486
Direct Bilirubin	50	2.73	13.61
PH	50	7.39	0.06
PaO2	50	92.87	44.75
PaCO2	50	52.31	19.40
HCO3	49	30.31	9.56
A-a	49	27.70	57.39
BE-Ecf	50	5.28	16.33
CAT Score	50	19.88	5.51
Forced Expiratory Volume	50	52.53	22.84
Functional Vital Capacity (FVC (L)=2	50	65.54	23.29
FEV1/FVC1	50	65.40	19.95
Fef 25%-75%	50	36.52	24.11
No of days	23	2.43	3.81
CBC (Hb)	50	12.08	1.99
TLC	50	119.62	776.43
Total protein	50	6.52	0.820
Albumin	50	4.33	0.79

SGOT	50	34.30	22.07
SGPT	50	35.92	28.13
Duration	50	10.68	1.63

Mean ± SD (standard deviation) of serum urea, serum Creatinine, Sodium, Potassium, ALK, Random Blood Sugar, Total Bilirubin, Direct Bilirubin, RBS, Total Bilirubin, Direct Bilirubin, CBC (Hb), TLC, Total protein, Albumin, SGOT, SGPT and Duration respectively is 35.72 ±24.87, 0.87 ±0.29, 138.93±4.55, 4.20± 0.66, 101.66±35.95, 142.30±49.91, 0.51±0.486, 2.73±13.61,12.08±1.99, 119.62±776.43, 6.52±0.820, 4.33±0.79, 34.30±22.07, 35.92±28.13, 10.68±1.63 respectively. Mean ± SD of Pack years of smoking, PH, PaO2, PaCO2, HCO3, A-a, BE-Ecf, CAT Score is 7.39±0.06, 92.87±44.75, 52.31±19.40, 30.31±9.56, 27.70±57.39, 5.28±16.33, 19.88±5.51 respectively.

Table2: Age Group in Years

	COPD	COPD with Bronchiectasis
≤50	2%	6%
51-60	8%	6%
61-70	12%	30%
71-80	12%	16%
≥81	2%	0
TOTAL	36%	64%

Mean ± SD of Forced Expiratory Volume, Functional Vital Capacity (FVC), FEV1/FVC, FEF (25 -75)%, No of days is 52.53±22.84, 65.54±23.29, 65.40±19.95, 36.52±24.11, 2.43±3.81, respectively. Comparison of the Association between Age in Years ≤50 in subjects COPD is (N=1) and COPD BE is (3), Age in Years of 51-60 subjects in COPD (N=4) and COPD BE (N=6), Age in Years of 61-70 subjects in COPD (N=6) and COPD BE (N=15), Age in Years of 71-80 subjects in COPD (N=6) and COPD BE (N=8) group revealed a statistical non-significant outcome with Chi-square value: 2.8460, P- value: 0.5839.

Table 3: Gender

	COPD	COPD with Bronchiectasis
Female	8%	24%
Male	28%	40%
TOTAL	36%	64%

Comparison of gender between COPD and COPD BE respectively, reveals female (N=4) and (N=12) respectively, reveals male (N=14) and (N=20) respectively, and the association revealed a statistically non-significant outcome with Chi-square value: 1.2357, P- value: 0.2663, Odds Ratio: 0.4762 (0.1270, 1.7857).

Comparison of association between Potential Pathogenic Micro-organism between COPD subjects and COPD BE subjects reveal that COPD subjects with Pseudomonas Aeruginosa (N= 1), COPD BE with Pseudomonas Aeruginosa (N = 1), COPD subjects with Unknown outcome (N =17) and subjects of COPD BE with Unknown outcome (N = 31) revealed a statistical non-significant outcome with Chi-square value: 0.17, P- value: 0.67, Odds Ratio: 1.82(0.10, 31.03).

Comparison of past use of steroids/use of Long-acting beta agonists between COPD and COPD BE subjects reveal that COPD subjects using Steroids/Long-acting beta agonists (N= 9), COPD BE subjects (N = 19) and COPD subjects not using Steroids/Long-acting beta agonist (N =9), COPD BE (N = 13) revealed a statistical non-significant outcome with Chi-square value: 0.41, P- value: 0.52, Odds Ratio: 1.46 (0.45,4.67).

Comparison of Tuberculosis between COPD subjects and COPD BE subjects that is COPD subjects with Tuberculosis (N= 3), COPD BE subjects with Tuberculosis (N = 17) and COPD subjects without Tuberculosis (N =15), COPD BE subjects without Tuberculosis (N=15), revealed a statistically significant outcome with Chi-square value: 6.38, P-value: 0.01, Odds Ratio: 5.66 (1.36, 23.46).

Table 4: Association of variables between COPD and COPD with Bronchiectasis: Group

		COPD	COPD with Bronchiectasis	TOTAL	Chi- square value	p- value
Hemoptysis	Yes	4%	8%	12%	0.02	0.88 Odds Ratio: 1.14(0.18, 6.94)
	No	32%	56%	88%		
	TOTAL	36%	64%	100%		
Exacerb	Yes	22%	42%	64%	0.10	0.74 Odds Ratio: 1.21 (0.36, 4.01)
	No	14%	22%	36%		
	Total	36%	64%	100%		
Admission	Yes	10%	20%	30%	0.06	0.79 Ratio: 33
	No	26%	44%	70%		
	TOTAL	36%	64%	100%		

Wheeze	Yes	28%	60%	88%	2.78	0.09 Odds Ratio: 4.28(0.69, 26.24)
	No	8%	4%	12%		
	TOTAL	36%	64%	100%		

Comparison of h/o haemoptysis between COPD subjects and COPD BE subjects, that is COPD subject with h/o haemoptysis (N= 2), COPD BE subject with h/o haemoptysis (N = 4) and COPD subjects without haemoptysis (N =16), COPD BE subject without h/o haemoptysis (N = 28), revealed a statistical non-significant outcome with Chi-square value: 0.02, P- value:0.88, Odds Ratio: 1.14 (0.18, 6.94).

A comparison of exacerbations between COPD subjects and COPD BE subjects, that is, between a COPD subject with exacerbation (N= 11), a COPD BE subject with exacerbation (N = 21), and a group of COPD subjects without Exacerbation (N = 7), and a COPD BE subject without exacerbation (N = 11) group, revealed a statistically non-significant outcome with a Chi-square value of 0.10, a P-value of 0.74, and an Odds Ratio of 1.21 (0.36, 4.01).

A comparison of hospital admissions between COPD subjects and COPD BE subjects, that is, between COPD subjects with hospital admissions (N= 5), COPD BE subjects with hospital admissions (N = 10), and a group of COPD subjects without hospital admissions (N = 13), and between COPD BE subjects without hospital admissions (N = 22), revealed a statistically non-significant outcome with a Chi-square value of 0.06, a P-value of 0.79, and an Odds Ratio of 1.18 (0.33, 4.22).

Comparison of wheezing between COPD subjects and COPD BE subjects that in the Group of COPD subjects, with Wheeze (N= 14), COPD BE subjects with wheeze (N = 30) and COPD subjects without Wheeze (N = 4) and COPD BE subject without Wheeze (N = 2) revealed a statistically significant outcome with Chi-square value:2.78, P- value:0.09, Odds Ratio:4.28(0.69, 26.24).

Comparison of the association of comorbidities (if present) between COPD and COPD BE subjects revealed a statistically insignificant outcome, with a Chi-square value of 14.1993 and a P-value of 0.2882.

Comparison of outcome (expired/survived) between COPD and COPD BE subjects revealed a statistically insignificant outcome with a Chi-square value: 0.5966, P- P-value:(0.4320).

As depicted in Table 12, the Comparison of the association between the invasive ventilation group, which includes COPD subjects with invasive ventilation (N =1) and subjects of COPD BE with invasive ventilation (N = 4), and the group of COPD subjects without invasive ventilation (N = 17) and subjects of COPD BE without invasive ventilation (N = 28) revealed a statistically insignificant outcome, with a Chi-square value of 0.61, a P-value of 0.43, and an Odds Ratio of 2.42 (0.25, 23.57).

Table 5: Comparison of mean of variables: Group

		Number	Mean	SD
PH	COPD	18	7.388	.0681
	COPD with Bronchiectasis	32	7.398	.0629
PaO2	COPD	18	88.20	36.4786
	COPD with Bronchiectasis	32	95.49	49.1591
PaCO2	COPD	18	46.10	11.5103
	COPD with Bronchiectasis	32	55.80	22.0755
HCO3	COPD	17	26.25	9.3442
	COPD with Bronchiectasis	32	32.47	9.1039
A-a	COPD	18	24.03	74.6563
	COPD with Bronchiectasis	31	29.83	45.8206
BE-Ecf	COPD	18	5.733	9.7264
	COPD with Bronchiectasis	32	5.034	19.2302
Forced Expiratory Volume	COPD	18	59.72	18.8892
	COPD with Bronchiectasis	32	48.49	24.1350
Functional Vital Capacity (FVC)	COPD	18	73.83	22.0967
	COPD with Bronchiectasis	32	60.89	22.9704
FEV1/FVC	COPD	18	66.41	11.7205
	COPD with Bronchiectasis	32	64.84	23.5220
FEF 25%-75%	COPD	18	37.83	14.5693
	COPD with Bronchiectasis	32	35.79	28.2998

Mean comparison of variables between COPD and COPD BE group when an independent sample t-test is applied to compare the means between the two groups (COPD and COPD with Bronchiectasis), there is a statistical significance difference found in following variables: Age (in years) (p=0.002,95% CI,-12.03,- 2.791), smoking pack years (p=0.010,95% CI,-25.82,-3.764), PH (p=0.032,95% CI,0.006,0.14), PaCO2 (p=0.010,95% CI,-32.62,-4.60), HCO3 (p=0.037,95% CI,-10.44,-0.33), CAT SCORE (p=0.003,95% CI,-9.74,-2.11).

Table 6: Independent sample t test to compare the means of variables: (ABG parameters) between the two groups (COPD with Bronchiectasis and COPD without Bronchiectasis)

95% Confidence Interval of the Difference					
F	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Lower**	**Upper**
1.493	.032	.075972	.03438	.0068	.145106
		0.075	.034581	.006355	0.1455
.428	.591	6.182	11.430	-16.799	29.164
		6.182	11.232	-16.474	28.838
4.293	.010	-18.617	6.967	-32.626	-4.609
		-18.617	7.036	-32.802	-4.433
3.118	.037	-5.391	2.515	-10.448	-.334
		-5.391	2.536	-10.500	-.282
1.318	.297	-16.928	16.070	-49.239	15.383
		-16.928	16.178	-49.506	15.650
.933	.999	-0.008	4.672	-9.403	9.385
		-0.008	4.570	-9.250	9.233

Forced Expiratory Volume (FEV1) (p=0.003,95% CI,5.52,24.86), Functional Vital Capacity (FVC) (p=0.001,95% CI,9.90,37.03), Forced expiratory volume \ Functional vital capacity (FEV1/FVC) (p=0.003,95% CI,3.29,15.03), Forced expiratory flow 25% and 75% (FEF 25-75) (p=0.007,95% CI,4.74,27.98).

Table 7: Independent sample t-test to compare the means of VARIABLES: (clinical parameters) between the two groups (COPD with Bronchiectasis and COPD without Bronchiectasis)

95% Confidence Interval of the Difference						
Variables	**F**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Lower**	**Upper**
AGE (in years)	1.757	.002	-7.410	2.297	-12.03	-2.79
			-7.410	2.271	-11.981	-2.840
Smoking pack years	.009	.010	-14.795	5.486	-25.826	-3.764
			-14.795	5.502	-25.865	-3.725
Number of exacerbations per year	.000	.055	-.904	.459	-1.827	.020
			-.904	.460	-1.829	.021
Number of times Non-invasive or Invasive ventilation per year	.287	.225	-.282	.229	-.743	.179
			-.282	.229	-.743	.179
Number of days on Non-invasive or Invasive ventilation per year	2.156	.124	-1.022	.654	-2.337	.292
			-1.022	.657	-2.345	.300

DISCUSSION

Summarising salient findings in our study, the majority of the COPD population, including COPD BE subjects, are 61-70 age group, smokers of the male gender. The majority of subjects presented with cough with expectoration, breathlessness, chest pain and a few with haemoptysis or other symptoms. History of previous exacerbation is present in 64% & with exacerbation frequency per year being <2 episodes in 64.6%, & >2 episodes yearly in 32.2%. Invasive Ventilation & hospital admission history are present in 5 (10%) & 15 (30%) subjects, respectively. Most sputum microbiology did not reveal any microorganisms except in a few cases, detecting Pseudomonas. CAT score > 20 in 64%, and mmrc 3 or 4 in 52% of subjects. Comorbidity is present in 70% of cases, with bronchiectasis as the most common one. Radiological Findings of Cystic bronchiectasis present in 2 (6.3%), Cystic and Tractional in 1 (3.1%), and Tractional in 29 (90.6%). Subjects were divided into Group COPD 18 (36%) and COPD with Bronchiectasis 32(64%). Subjects were classified into 2 groups: a group of survivors (GS) and a group of patients who died (GD) after a 6-month follow-up period. The outcome was GD in 15 (30%) & GS in 35 (70%). The above findings regarding the sociodemographic profile, clinical symptoms and symptom score, radiological findings, sputum microbiology and comorbidities match with numerous studies and data of meta-analysis conducted previously and need no discussion.

Our study theorised the prevalence of bronchiectasis and compared the clinical characteristics of COPD with COPD BE. Most of our findings match those of the 2015 study[7], which conducted a meta-analysis of all relevant human clinical trials during the first eight months of 2014. They found a mean prevalence of bronchiectasis in COPD patients at 54.3%, with a range of 25.6% to 69%. These two conditions were found more often in males with longer smoking histories.

Though COPD and bronchiectasis share some similarities, we found significant differences in several variables between the COPD and COPDBE groups, including age, smoking pack years, pH,

PaCO2, HCO3, CAT score, FEV1, FVC, FEV1/FVC, and FEF (25-75) %. These results indicate that these factors are crucial in differentiating disease severity and patient outcomes. There is a statistically insignificant difference between the number of exacerbations per year, the number of times non-invasive or Invasive ventilation number of days on non-invasive or Invasive ventilation per year, and the MMRC grade.

Age, smoking pack years, FEV1 & FEV1/FVC differ significantly between COPD and COPD BE groups in our study. This finding parallels the results of Izquierdo M et al,[11] (2023) who also found a significant difference in age, smoking pack years, FEV1 & FEV1/FVC between COPD and COPD BE. Izquierdo M et al,[11] (2023) also identified significant associations between bronchiectasis and lower lung function (FEV1 and FEV1/FVC), which aligns with our findings on the importance of lung function measures. In contrast, the findings by Kawamatawong T et al, [8] (2018) reported a non-significant difference in FEV1 between COPD patients with and without bronchiectasis (P = 0.91). The FEV1/FVC ratio, an indicator of airway obstruction, differs nonsignificant between COPD and COPD BE, as per the results of Finch S et al. [12] (2020).

Regarding FVC, our study demonstrated a significant difference, with the COPD group showing higher values (73.83 ± 22.97) and lower values in the COPDBE group (60.89 ± 22.97), with a P-value of 0.048. This indicates better overall lung capacity in the COPD group compared to COPDBE, matching various previous studies. This finding is consistent with An TJ et al. [13] (2019), who also noted that changes in FVC correlate with lung function decline and symptom severity.

In contrast to our study, Gülşen A et al,[14] (2020) highlight that FEF 25-75, a marker of small airway function, shows a nonsignificant difference between COPD (37.83 ± 14.56) and COPDBE (35.79 ± 28.29) groups (P = 0.77). This underscores the similar small airway impairment observed in both conditions. The possible explanation for this difference in FEF findings could be the predominance of post-tubercular bronchiectasis in this demographic profile, along with COPD, which affects the parenchymal architectural distortion, altering the FEF values.

CONCLUSION

The majority of COPD subjects were between the 61-70 age group, male & current or former smokers. Among smokers, 62.8% of subjects had more than five packs of years of smoking. H/O exacerbation is present in 64%, the CAT score was greater>20 in 64%, and MMRC 3/4 in 52%, with comorbidity in 70% of cases, one-third of the population died in the 6-month follow-up period.

The association of the following variables between COPD and COPD-BE reveals statistically significant differences: History of TB, Daily sputum volume, Age, Smoking pack years, ph, PCO2, HCO3, and CAT score. FEV1, FVC, FEV1/ FVC and PEF (25 – 75) %. The comparison of spirometry findings between COPD and COPDBE groups and related findings provides valuable insights into the role of lung function and indicates that COPD, together with bronchiectasis, should be considered a pathological phenotype of COPD, which may have a predictive value.

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