Original Research Article

The clinical profile of obstructive lung diseases patients attending tertiary care hospital in Nanded, Maharashtra: an observational study

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ABSTRACT

Background: Obstructive lung diseases as asthma and Chronic Obstructive Pulmonary Disease (COPD) have considerable morbidity and mortality globally. Chronic obstructive pulmonary disease (COPD) remains a major public health problem. It is projected to rank fifth in 2020 in burden of disease worldwide, according to the WHO study. Aim and objectives was to evaluate clinical profiles of obstructive lung diseases patients attending tertiary care hospital.
Methods: The data was collected from 112 obstructive lung diseases patients presenting to OPD of pulmonary medicine department from January 2009 to August 2010. Research tool comprised of questions about demographic characteristics, past or presenting symptoms, general and systemic examinations. For statistical analysis MS Excel and SPSS 16 were used.
Results: Overall 72 (64.28%) were smokers. 63 (56.25%) were suffering from COPD and 49 (43.75%) were asthmatic. Breathlessness was found as most common symptom in 53 (84.12%) COPD and in 45 (91.83%) asthma patients. Among COPD patients, 26 (41.26%) were of moderate obstruction whereas in asthma patients, 17 (34.69%) were of moderate obstruction and 16 (32.65%) were of severe obstruction as per Pulmonary Function Tests (PFT).
Conclusions: Males were most commonly affected in obstructive lung diseases. COPD was common after 35 years of age where as asthma occurs mostly before 35 years of age. Smoking was most common etiological factor. Breathlessness was the most common presenting symptom. Family history of asthma was most common risk factor for asthma patients. Most of the patients with both COPD as well as asthma had moderate type of obstructions.

Keywords: Asthma, COPD, Clinical profile, Obstructive lung diseases

INTRODUCTION

Chronic airway disease with or without chronic airflow limitation (CAL) is a major cause for morbidity. Several diseases cause chronic airflow limitation, notably asthma, Chronic Obstructive Pulmonary Disease (COPD), Bronchiectasis and Obliterative Bronchiolitis (OB). If we consider together, asthma and COPD represent the most common chronic lung disease world wide.[1] For proper management of the patient it is necessary to distinguish these patients as asthma or those with COPD.

Asthma can be defined as a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night and in the early morning. These episodes are usually associated with

widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment.[2]

The working definition of COPD, as noted in the Global Initiative for Obstructive Lung Disease (GOLD) guidelines, is that COPD is a preventable and treatable disease with some significant extra pulmonary effect that may contribute to the severity in individual patient.[3] Its pulmonary component is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases.

History of atopy and improvement in Spirometry after bronchodilators or glucocorticosteroids point towards diagnosis of bronchial asthma. COPD is usually tobacco smoking related and is diagnosed in presence of history of smoking. Cigarette smoke is the most commonly encountered risk factor for COPD and elimination of this risk factor is an important step toward prevention and control of COPD. However, other risk factors for COPD should be taken into account where possible, including occupational dusts and chemicals, and indoor air pollution from biomass cooking and heating in poorly ventilated dwellings the latter especially among women in developing countries.[4]

For diagnosis and management of obstructive lung diseases a number of investigations are available, some of these include; chest X-ray, blood investigations, Spirometry, sputum examination, peak flow measurements, bronchial provocation test, skin tests, blood gases, exercise testing and DLCO. Measurements of standard frontal and lateral radiographs that reliably predict the presence or absence of COPD would be useful to clinical radiologist when no other clinical data is available.[5]

In bronchial asthma the standard test for evaluating airway narrowing is Spirometry. The test is based on the fact that, during exhalation increasing effort does not increase expiratory airflow; maximal flow occurs without great effort, and airway narrowing due to disease can be detected as a decrease in expiratory airflow.[6] The overall attributable fraction of asthma symptoms caused by atopy was 30%.[7]

Chronic obstructive pulmonary disease (COPD) is usually easy to distinguish from asthma, but sometimes the distinction from late-onset asthma in older patients, particularly in cigarette smokers, is difficult and may be impossible.[8] Both diseases are characterized by the presence of airflow obstruction but have distinct pathogenesis, inflammatory pattern, and prognosis.

The present study was conducted to distinguish clinically the patients presenting with chronic airflow limitation as asthma or COPD.

METHODS

The present study was conducted in pulmonary unit of a tertiary care Government hospital, Nanded, Maharashtra. This was an observational study carried from January 2009 to August 2010. Data was collected from patients presenting with symptoms of obstructive lung disease such as breathlessness, cough, chest tightness and wheeze during March 2009 to March 2010. Total 112 patients were enrolled in this study. Institutional Ethical committee approval was taken.

Patients were categorized into asthma and COPD after clinical examination and Spirometry.

Inclusion criteria

- All patients presenting with complaints of cough, breathlessness, chest tightness, wheezing and paroxysmal nocturnal dyspnoea for first time.
- All diagnosed cases of bronchial asthma and COPD patients presenting with respiratory complaints.

Exclusion criteria

- Patients of age group <13 years,
- Patients with active pulmonary tuberculosis,
- Recent myocardial infarction (<1month).

Clinical parameters

Age, gender, height (in meter), weight (in kg), systolic and diastolic blood pressure (in mm Hg) were noted along with detail history, including detail smoking history like type of active smoking whether bidi or cigarette and smoking index was noted. Detail clinical examination was done for all the patients.

Investigations carried out by X-ray chest PA view, sputum for AFB-three samples (acid fast bacilli) and by spirometry.

After physical examination and investigations, an informed consent was obtained from all the patients. Patients were informed regarding with holding bronchodilator medications and abstinence from smoking. Patients were also instructed about the maneuver thoroughly prior to testing and were also positioned in a proper way.

In all patients baseline spirometry was done with computerized Medgraphics spirometer. This spirometer met American thoracic society criteria and was volume calibrated daily. Measurement accuracy of spirometer was $\pm2\%$. The patient was subjected to spirometric study in Pulmonary Function Test (PFT) laboratory. Bronchodilator response was assessed by giving nebulized salbutamol in a dosage of 2.5mg (0.5ml) diluted with 2ml. 0.9% normal saline. Available as 5mg/ml. 15minutes after nebulization with salbutamol,

spirometry was performed. The best of three consecutive measurements were taken. After spirometry patients were differentiated as those with good bronchodilator response, those with poor bronchodilator response, mixed ventilator disorder and normal spirometry.

Asthma was diagnosed on the basis of Global Initiative for asthma guidelines i.e. history of paroxysmal dyspnoea, seasonal variation, wheeze, hypersensitivity to allergens, family history of asthma and spirometry showing forced expiratory volume in one second (FEV_1) and forced vital capacity (FVC) ratio less than 70% and FEV_1 less than 80% predicted with good bronchodilator reversibility i.e. as improvement FEV_1 by 12% and 200ml. Also, patients with normal Spirometry from their history were included in asthma as with Intermittent asthma.

Diagnosis of COPD was based on global Initiative for obstructive lung disease guidelines i.e. cough with sputum production for most of the days in a year at least 3months for 2 consecutive years or dyspnea with history of exposure for risk factors (e.g. tobacco smoking), progressive breathlessness and spirometry showing FEV_1/FVC less than 70% and FEV_1 less than 80% predicted with poor bronchodilator reversibility. Also, patients with mixed ventilator disorder were included in COPD patients, as all of them had poor bronchodilator response on spirometry.

COPD patients were further staged as mild, moderate, severe, very severe as per the GOLD guidelines and asthma patients as Intermittent, mild persistent, moderate persistent and severe persistent according to GINA guidelines.

RESULTS

Patients in present study, were categorized as per post bronchodilator FEV_1 reversibility, as those with asthma (>12% or 200 ml reversibility in FEV_1) and those with Chronic Obstructive Pulmonary Disease i.e. COPD (<12% reversibility or 200ml in FEV_1).

Table 1: Distribution of patients with obstructive airway diseases.

Disease	Total	Percentage (%)
COPD	63	56.25%
Asthma	49	43.75%
Total	112	100%

In this study, it was observed that out of 112 participants, 63 (56.25%) were suffering from COPD and remaining 49 (43.75%) were asthmatic (Table 1), 74(66.07%) participants were males and 38 (33.92%) were females (Table 3). Out of COPD patients, 27 (42.85%) were from age group of 45-54 years and 23 (46.93%) asthmatic patients were from 35-44 years of age group (Table 2).

Table 2: Age wise distribution of patients.

Age (years)	COPD numbers (%)	Asthma numbers (%)	Total numbers (%)
14-24	00(0%)	09(18.36%)	09(8.03%)
25-34	04(6.34%)	11(22.44%)	15(13.39%)
35-44	08(12.69%)	23(46.93%)	31(27.67%)
45-54	27(42.85%)	04(8.16%)	31(27.67%)
55-64	16(25.39%)	02(4.08%)	18(16.07%)
65-74	04(6.34%)	00(0%)	04(3.57%)
75-84	04(6.34%)	00(0%)	04(3.57%)
Total	63(100%)	49(100%)	112(100%)

Table 3: Gender distribution and smoking habit of patients.

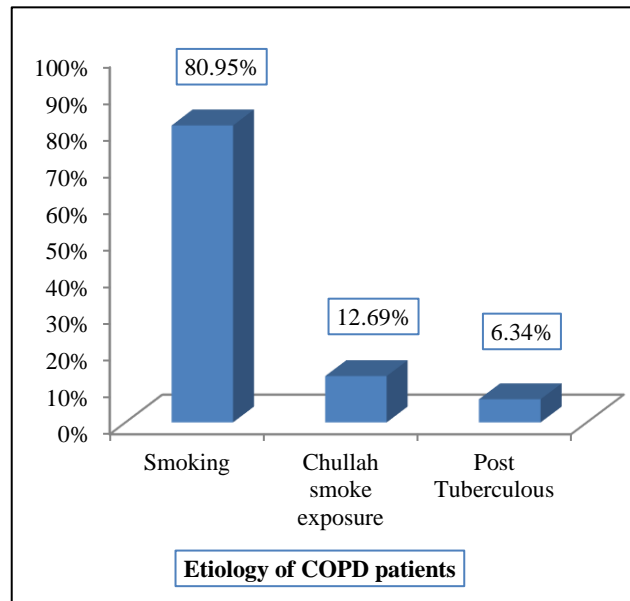|	COPD (n=63)	Asthma (n=49)	Total (n=112)
Gender distribution			
Males	47(74.60%)	27(55.10%)	74(66.07%)
Females	16(25.39%)	22(44.89%)	38(33.93%)
Smoking habit			
Smokers	51(80.95%)	21(42.85%)	72(64.29%)
Non-smoker	12(19.04%)	28(57.14%)	40(35.71%)

Figure 1: Etiology in patients of COPD (n=63).

The total numbers of smokers were 72 (64.28%). In all COPD patients, smoking 51 (80.95%) was found as major etiological factor (Figure 1). Also, it was noticed that, 36 (73.46%) asthmatic patients had significant family history (Figure 2). Breathlessness was found as presenting symptom in 53 (84.12%) COPD patients and in 45 (91.83%) asthma patients (Table 4). Hyperinflation seen in 39 (61.90%) COPD patients was the most common radiological finding followed by, bronchovascular prominence seen in 20 (31.74%)

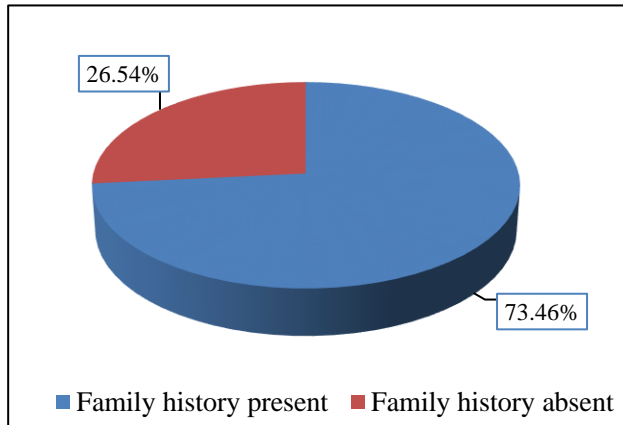patients and fibrosis seen in 4 (6.34%) patients with COPD (Table 5).

Figure 2: Significance of family history of asthma (n=49).

Table 4: Symptomatology and signs of respiratory failure.

	COPD (n=63)	Asthma (n=49)
Symptoms		
1)Breathlessness	53(84.12%)	45(91.83%)
2)Cough	43(68.25%)	40(81.63%)
3)Chest tightness	31(49.20%)	25(51.02%)
4)Wheeze	28(44.44%)	42(85.71%)
Signs of respiratory failure		
Cyanosis	21(33.33%)	17(34.69%)
Bounding pulse	25(39.68%)	08(16.32%)
Hypertension	09(14.28%)	01(2.04%)
Altered sensorium	03(4.76%)	01(2.04%)

Table 5: X ray features in patients with COPD (n=63).

Findings	Total	%
Hyperinflation	39	61.90%
Broncho-vascular Prominence	20	31.74%
Fibrosis	04	6.34%
Total	63	100%

Table 6: Distribution of COPD patients as per pulmonary function tests (PFT) according to gold guidelines (n=63).

Severity	Total	Percentage %
Mild	09	14.28%
Moderate	26	41.26%
Severe	20	31.74%
Very severe	08	12.69%
Total	63	100%

Among 63 COPD patients, 26 (41.26%) were of moderate obstruction and 20 (31.74%) were of severe obstruction whereas in asthma patients, 17 (34.69%) were of moderate obstruction and 16 (32.65%) were of severe obstruction as per Pulmonary Function Tests (PFT) (Table 6 and 7).

Table 7: Distribution of asthma patients as per pulmonary function test (PFT) According to GINA guidelines (n=49).

Severity	Total	Percentage %
Intermittent	08	16.32%
Mild persistent	08	16.32%
Moderate	17	34.69%
Severe	16	32.65%
Total	49	100%

DISCUSSION

In Mumbai, India similar study was conducted in a tertiary care hospital where it was observed that 63% participants had asthma and 17% had COPD, 64% were men and 36% were women. All the cases of COPD were above 40 years of age, mean age was 54 years, age range 40 to 75 years and male:female ratio of 45:1 and 98% were smokers. Out of COPD patients, 30% cases presented with mild airflow limitation whereas 33% cases had moderate and 37% cases had severe obstruction on spirometry. In all asthma cases the age range was 12 to 75 years, with mean age of 38 years. It was more common in men 60%, only 7% patients were smokers, 42% cases had mild obstruction and 35% had moderate obstruction on spirometry.[9]

In another similar study done in West Indies, amongst patients admitted in a hospital for respiratory complaints it was observed that mean age was 50 years, 46.1% were males and 44% were smokers. Among total participants 12.4% had asthma and 20.9% had COPD. Mean age of COPD patients was 60.3 years and in asthma 47.8 years. Among COPD patients 43% had moderate obstruction.[10]

One study was conducted by Jindal SK et al, it was observed that study subjects having COPD had mean age of 35 years and above, male to female ratio was 1.56:1, most of the patients with COPD were smokers and smokers to non smokers ratio was 2.65:1.[11]

Gupta SK et al, carried one studied on 6530 adult asthmatics, and they found that 54.5% were males and 45.5% were females, family history of asthma was present in 80.1% of asthma patients, male to female ratio was 1.8:1, most common symptom was post nasal drip in 67.1% patients.[12]

One study was carried out by Liou A et al, which had findings as, 97 patients (65.1%) were females, rhinitis was presenting symptom in 69.9% patients, 36.9% were smokers, 17% patients had mild intermittent asthma, 25% had mild persistent asthma, 34% had moderate persistent asthma, and 24% had severe persistent asthma.[13]

CONCLUSION

From this study, authors concluded that, male preponderance was seen in both COPD (74.60%) as well as in asthma (55.10%) patients. COPD was common after 35 years of age and as the age increases incidence of COPD increases with mean age in present study was 52.93 years. Whereas asthma occurs mostly before 35 years of age and mean age in present study was 36.48 years. Smoking was most common etiological factor in COPD (80.95%) and in asthma (42.85%) patients. Breathlessness was the most common symptoms in COPD (84.12%) and in asthma (91.83%) patients. Family history of asthma was most common risk factor for asthma (73.46%) patients. Most of the patients with both COPD (41.26%) as well as asthma (34.69%) who presented for the first time had moderate type of obstruction as per Pulmonary Function Tests (PFT).

REFERENCES

1. Mauad T, Dolhnikoff M. Pathologic similarities and differences between asthma and chronic obstructive pulmonary disease. Current Opinion Pulmonary Med. 2008 Jan 1;14(1):31-8.
2. Fishman AP, Elias J, Fishman J, Grippi M, Senior R, Pack A. Fishman's Pulmonary Diseases and Disorders. 4th ed. 2009:789.
3. Bacon BR. Harrison's Principles of Internal Medicine. 19e. 2015:1700-1707.
4. Rabe KF, Hurd S, Anzueto A, Barnes PJ, Buist SA, Calverley P, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. Am J Res and Critical Care Med. 2007 Sep 15;176(6):532-55.
5. Reich SB, Weinshelbaum A, Yee J. Correlation of radiographic measurements and pulmonary function tests in chronic obstructive pulmonary disease. American J Roentgenol. 1985 Apr 1;144(4):695-9.
6. Rosen D. Murray and Nadel textbook of Respiratory Medicine. 3rd ed. 2012:1181.
7. Aggarwal AN, Chaudhry K, Chhabra SK, D Souza GA, Gupta D, Jindal SK, et al. Prevalence and risk factors for bronchial asthma in Indian adults: a multicentre study. Ind J Chest Dis All Sci. 2006;48(1):13-22.
8. Tzortzaki EG, Proklou A, Siafakas NM. Asthma in the elderly: can we distinguish it from COPD?. J Allergy. 2011;2011.
9. Gothi D, Shah DV, Joshi JM. Clinical profile of diseases causing chronic airflow limitation in a tertiary care centre in India. JAPI. 2007 Aug;55:551.
10. Seemungal T, Harrinarine R, Rios M, Abiraj V, Ali A, Lacki N, Mahabir N, Ramoutar V, Poon King C, Bhowmik A, Wedzicha JA. Obstructive lung disease in acute medical patients. West Ind Med J. 2008 Jan;57(1):7-13.
11. Jindal SK. Emergence of chronic obstructive pulmonary disease as an epidemic in India. Ind J Med Res. 2006 Dec 1;124(6):619-630.
12. Gupta SK. Clinical profile of bronchial asthma in eastern India-A prospective analysis of 7208 patients. Lung India. 1996 Jun 1;14(2):60.
13. Liou A, Grubb JR, Schechtman KB, Hamilos DL. Causative and contributive factors to asthma severity and patterns of medication use in patients seeking specialized asthma care. Chest. 2003 Nov 1;124(5):1781-8.