



Prevalence and Therapy of Chronic Obstructive Pulmonary Disease in Karachi

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Research Article

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Abstract

Chronic obstructive pulmonary disease (COPD) has been one of the main causes of mortality world widely. The impact of COPD has been increased socio-economically with span of time. COPD has become fire alarming condition for health associated professionals due to the severity of prevalence and its expensive treatment. Due to COPD, patients' not only suffers illness but also bears financial impacts. The main aim of present study was to determine the prevalence and the medication of COPD. Several propositions have been suggested regarding the pathophysiology of COPD. The medical records of patients suffering from COPD were collected from different tertiary care hospitals in Karachi from June 2011 to May 2012. The study has been comprised of middle adulthood stage to in mature age. In medical wards of different tertiary care hospitals in Karachi, Out of 1260 patients 174 (13.80%) were suffered from COPD. It has been noted nearly all the patients of COPD were associated with co-morbidity like diabetes mellitus, hypertension, urinary tract infections, renal failure, pneumonia, cardiovascular diseases, and other diseases. Anti-allergy, oxygen supply, intravenous and oral montelukast, atrovent and other nebulizers, cough syrups, inhalers, antibiotics, and other treatment were used for the treatment of COPD as directed by the world renowned guidelines for COPD. Major guidelines have been provided by various societies like British Thoracic Society, The Americans Thoracic Society, and European Respiratory Society to treat COPD. Spirometry, either in conjunction with a clinical examination or used alone, to reach a prevalence estimate.

Keywords: Chronic obstructive pulmonary disease; Prevalence; Treatment

Introduction

Chronic obstructive pulmonary disease (COPD) has been the fourth main reason of death in the United States, exceeded only by cancer, heart disease, and cerebro-vascular accidents¹. The impact of COPD has been increased socio-economically with passage of time. There are numerous hypotheses regarding the pathogenesis of COPD. Airway inflammation, proteolysis in the lungs, and oxidative stress has been major cause of COPD².

COPD is one of the leading causes of death for the last 30 years and has been projected to be the third leading cause of mortality by 2020³. It has been estimated that expenses on COPD was \$ 23 billion in 2000 and which may be increased to \$ 37.2 billion in 2004⁴. COPD is a lung disease in which the lungs have been damaged, made it difficult to breathe. In COPD, elastic quality of air sacs (alveoli) has been lost. Common signs and symptoms of COPD are coughing, increase sputum production, shortness of breath, and wheezing⁵.

There are many factors may provoke the incidence of COPD like smoking, dust, pollen, α -1 antitrypsin (AAT) deficiency, lung infections, and air pollution. Smoking or exposure to tobacco is a primary cause of COPD. The mortality due to COPD is ten times higher in smokers as compared to non-smokers⁶. The most striking example of the potential mismatch between risk factor exposure and COPD prevalence concerns the primary risk factor for COPD, cigarette smoking. Many countries or regions with high rates of smoking have a low reported COPD prevalence. In some cases, local theories involving genetic differences have been developed to explain differences in the expected rates of COPD⁷. It has been proved that cough and sputum were also produced in COPD by exposure of dusts, chemicals, vapors, and fumes. The improvement in arterial blood gas tensions may leads to COPD and/or may establish respiratory muscle fatigue⁸. The diagnosis



of COPD is based on the patient's symptoms including cough, sputum production, chest pain, and shortness of breath.

In recent years, pulmonary function test (PFT) which is also known as spirometry had wide application in diagnosis of clinical pulmonary diseases⁹. Bronchodilator reversibility testing (BRT) has been recommended in all patients with COPD¹⁰. Chest x-ray has been necessary in COPD while ultrasound has not been traditionally used for investigating lung parenchyma¹¹. It has been found that exercise capacity in patients with COPD have severe airways obstruction and has been more strongly related to inspiratory muscle strength and lung function¹².

Pharmacotherapy has been used to relieve patient's symptoms and improve quality of life. Guidelines have recommended short-acting bronchodilators as initial therapy for patients with mild or intermittent symptoms¹³. Oxygen therapy may be recommended to aid in the reduction of shortness of breath during COPD¹⁴. For patients with severe COPD, surgery has been recommended¹⁵. Major guidelines have been provided by various societies like British Thoracic Society, The Americans Thoracic Society, and European Respiratory Society to treat COPD. More recently, Global Initiative of Chronic Obstructive Lung Disease, a joint project of National Heart, Lung and Blood Institute and the World Health Organization has been issued a major statement on COPD¹⁶.

Bronchodilators have relaxed the muscles around the bronchi to allow easier breathing. Bronchodilators can be either short acting or long acting. Short-acting bronchodilators such as albuterol or ipratropium and long-acting bronchodilators including formoterol and salmeterol have been usually used in severe condition. The American Thoracic Society has been recommended anti-cholinergic as first line of maintenance therapy for COPD patients. β -2-agonists have been produced the desired effects by stimulating receptors in the sympathetic nervous system by dilated muscles tissues around the airways. Theophylline was the most widely prescribed COPD medication, but it has lost favor because of side effects. It has been found that 10% of the patients of COPD have been shown a significant improvement in lung function when treated with corticosteroids¹⁸.

Table 1: Complaints in COPD

Age	No. of Pts	Sex		Complaints							
		M	F	Chest pain	Dry cough	Cough with Sputum	Difficult/ SOB	Fever / Chills	GIT disturbance/ Vomiting/ Nausea	Sore throat/ Irritation in throat	Other Complaints
<40-50	34	18	16	15	13	21	27	12	07	12	18
51-60	23	14	09	17	09	12	21	13	11	17	16
61-70	57	32	25	31	21	33	52	36	30	29	26
71-80	48	34	14	23	21	27	44	37	41	37	29
81-90>	12	03	09	04	05	07	12	08	11	07	06

Antibiotics have been prescribed in COPD for prevention and cure of acute bronchial infections like acute bronchitis, sinusitis, and even pneumonia¹⁹.

Medications along with pulmonary rehabilitation programs have been recommended to prevent complications, prolong life, and improves quality of life. COPD treatment may include bronchodilators, steroids, and influenza and pneumococcal vaccines. The trend of increasing COPD mortality likely reflects the long latency period between smoking exposure and complications associated with COPD¹⁶.

Material and Method

This retrospective study was conducted at different tertiary care hospitals, Karachi, Pakistan. Medical records of patients who attended the medical units of different tertiary care hospitals of from June 2011 to May 2012 and diagnosed by pulmonary function test (PFT), bronchodilator reversibility testing (BRT), and lung function test (LFT) and chest x-ray were reviewed. These patients were included all referrals from both outpatient and hospital inpatient services. Age, sex, co-morbid conditions such as diabetes mellitus, hypertension, urinary tract infections, renal failure, pneumonia, cardiovascular diseases, and other diseases, complaints during COPD. The current treatment of COPD and symptomatic relief that followed was noted. The treatment consisted of medications like anti-allergy, oxygen supply, cough syrups, inhalers, antibiotics, intravenous and oral montelukast, atrovent and other nebulizers, and other treatment were noted. The risk factors associated with COPD diseases such as smoking were also noted.

Results

The number of diagnosis has been performed for COPD. Of these, 174/1260 had COPD. The age of patients were from less than equal to 40 years to



more than equal to 90 years. The patients were divided into five groups according to age range is around 10 years as shown in Fig. 1.

Table 2: Co-Morbidity with COPD

Age	No. of Pts	Sex		Co-Morbidity						
		M	F	DM	HTN	HPC	UTI	RD	CVD	OD
<40-50	34	18	16	23	32	27	12	27	07	01
51-60	23	14	09	17	19	16	07	20	10	03
61-70	57	32	25	31	36	31	19	53	09	07
71-80	48	34	14	33	39	27	14	39	11	08
81-90>	12	03	09	09	11	08	07	10	09	06

M: Male

F: Female

DM: Diabetes Mellitus

HTN: Hypertension

HPC: Hypercholesterolemia

UTI: Urinary Tract Infection

RD: Respiratory Disease (Pneumonia, Asthma, Bronchitis, Emphysema)

CVD: Cardiovascular Disease (Angina, Congestive Heart Failure, and Myocardial infarction)

OD: Other Diseases (Depression, Cancer, Gastrointestinal Problem, Joint Pain, Osteoporosis)

Table 3: Treatment of COPD

Age	No. of Pts	Treatment									
		Anti-Allergy	Oxygen Supply	IV Montelukast	Oral Montelukast	Nebulizer	Corticosteroids	Cough Syrups	Inhaler	Antibiotic	Other Treatment
<40-50	34	13	06	11	21	23	09	31	21	29	06
51-60	23	11	09	07	13	11	09	21	31	21	09
61-70	57	31	13	14	29	37	14	51	49	52	13
71-80	48	27	19	21	19	31	13	47	39	46	15
81-90>	12	09	11	07	05	08	04	11	12	12	03

The group of patients was further classified into male and female patients of COPD as given away in Fig. 2. It has been noticed that main that mainly patients have been suffered from difficult and/or shortness in breathing. It has been found that out of 101 male patients 32 were regular smokers while 11 were irregularly smokers and only 07 female were smoke. A large number of patients were suffered from cough with sputum, chest pain, fever, irritation in throat and gastrointestinal tract (GIT) disturbance as shown in table 1 and Fig. 3. The present study has revealed co-morbidity like diabetes mellitus, hypertension, urinary tract infections, renal failure, pneumonia, cardiovascular diseases, and other diseases associated with COPD were noticed as shown in table 2 and Fig. 4.

The medications were prescribed according to the guidelines of world renowned societies like British Thoracic Society, The Americans Thoracic Society, Global Initiative of Chronic Obstructive Lung Disease, and European respiratory Society. It has been revealed from the current study that mainly the patients were prescribed cough syrups, antibiotics, and inhalers. The therapy of COPD such as anti-allergy, oxygen

supply, intravenous and oral montelukast, ipratropium and other nebulizers, cough syrups, inhalers, antibiotics, and other medication as shown in table 3 and Fig. 5. There were few drug-drug interactions have been observed in prescriptions which will be discussed later on.

Discussion

COPD is a major health problem across the world. COPD prevalence has been increased with decreasing socioeconomic status. COPD has been ranged from 3.2% in France to 5.4% in the Netherlands²⁰. WHO has published world-wide prevalence of COPD at 0.8%²¹. Several other studies have reported the prevalence of COPD were approximately 4 to 6%^{22,23}. Our study has found the same results as that of Halbert *et al.* (2003) in which COPD rates tended to be higher for male than female²¹. The present study has been supported by Alam (1998) in which prevalence of smoking reported to be 21.6% while our study has shown 28.73% patients were smokers²⁴. COPD varies with age and smoking status, occurring rarely in individuals more than 40 years old, and less

frequently in non-smokers. Nearly all physicians acknowledge that the first step in patient management is the cessation of smoking²⁵.

Fig. 1: Number of Patients of COPD

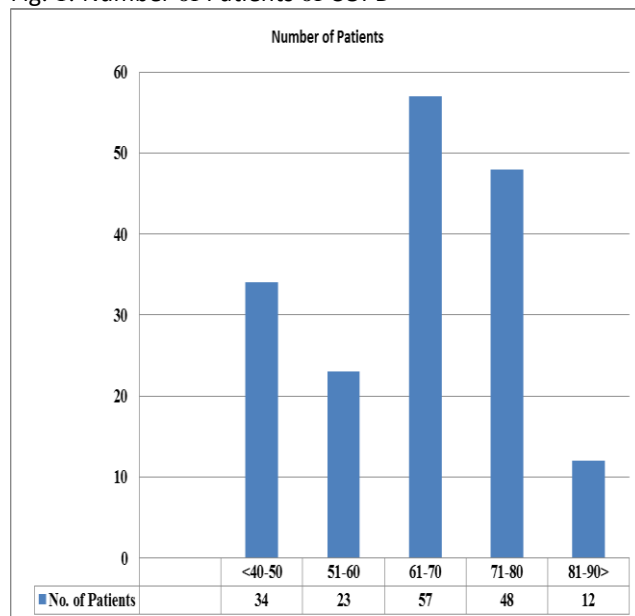




Fig. 2: Sex of Patients of COPD

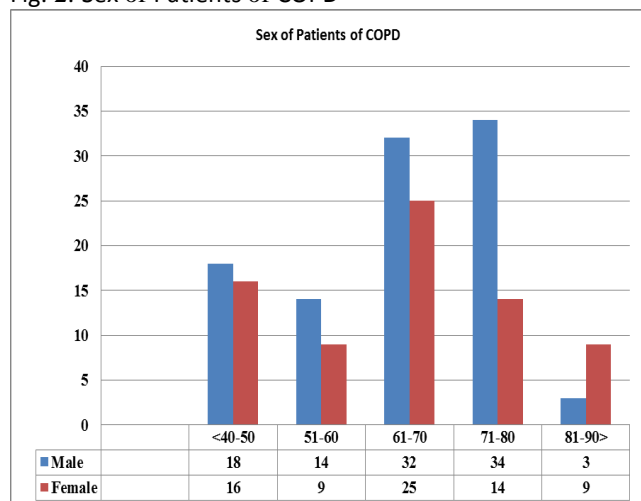


Fig. 5: Therapy for COPD

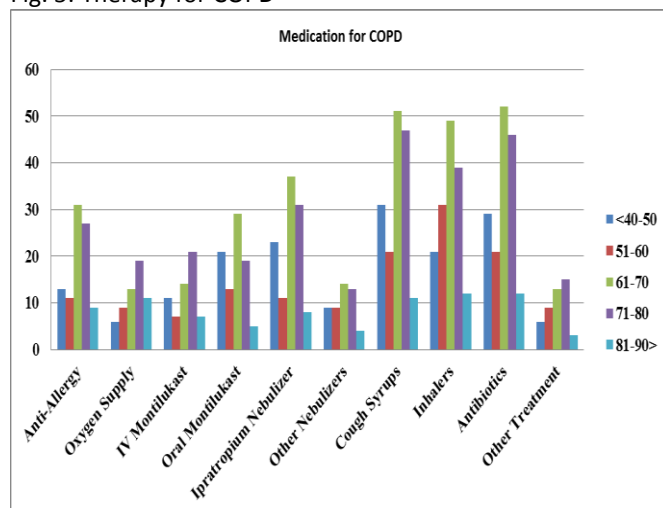


Fig. 3: Complaints of Patients in COPD

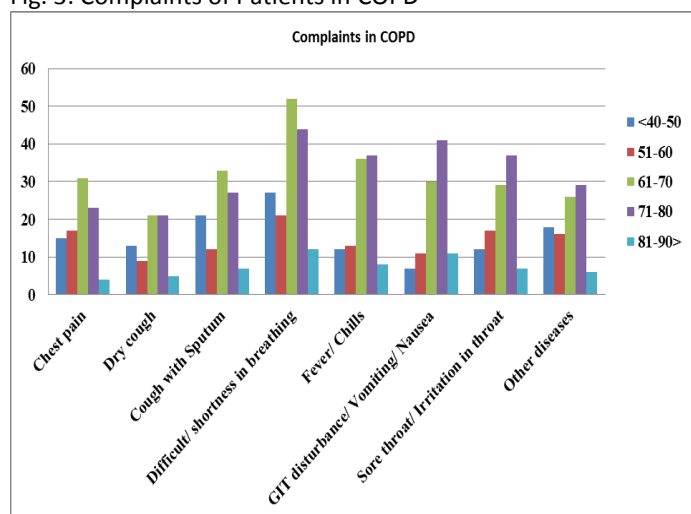
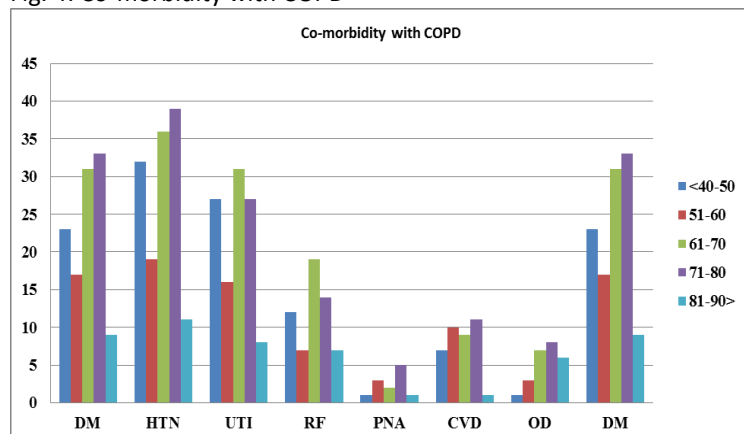


Fig. 4: Co-morbidity with COPD



DM Diabetes Mellitus
HTN Hypertension
UTI Urinary Tract Infection
RF Renal Failure
PNA Pneumonia
CVD Cardiovascular Disease
OD Other Diseases

COPD is characterized by airway inflammation and progressive airflow obstruction. Cough, breathlessness, and sputum production are the major symptoms of which patients complain²⁶. In a study, respiratory symptoms of dyspnoea, sore throat, cough, and nasal congestion/discharge (cold) has been noticed²⁷. Like Mahler and Mackowiak (1995) chest pain, shortness in breathing and co-morbidity like hypertension, renal failure, GIT problems during COPD has been noted²⁸. The present study has revealed that chest pain, cough, shortness and/or difficulty in breathing, fever, GIT disturbance, and sore throat with 51.72%, 97.12%, 89.65%, 60.90%, 57.47%, and 58.62% respectively.

A study conducted by Mannino *et al.* (2008) has found diabetes, hypertension, and cardiovascular disease in 12.7%, 40.1% and 15.2% patients, respectively²⁹. While in the case of present study 64.94%, 78.73%, and 62.64% were also suffered from diabetes mellitus, hypertension, and hypercholesterolemia correspondingly.

It has been noticed generally awareness of COPD in common people and many physicians is less and tend to under diagnose the condition, or they may tend to view obstructive symptoms as asthma until proven. It has been generally believed that inhaled corticosteroids have less potential for serious adverse effects than do systemic corticosteroids. The most common adverse effects of inhaled corticosteroids are local reactions caused by their deposition in the oropharynx³⁰. In general, the approach to therapy is variable, although recently a consensus statement on the optimal assessment and management of COPD has been published on behalf of the European Respiratory Society. The benefit of inhaled bronchodilators and inhaled corticosteroids has been also debated by patients²⁵. With respect to other bronchodilator classes, the majority of



physicians (80%) prescribed ipratropium bromide for their COPD patients.

Anti-allergic has been prescribed in COPD patients. In COPD, carbon dioxide toxicity can be prevented by careful control of the supplemental oxygen³¹. Rubinstein et al. (2004) supported that COPD patients were treated by montelukast with moderate to severe condition³². Current guidelines have recommend inhalation therapy (handheld inhalers - pressurized metered-dose inhalers (pMDIs), dry powder inhalers (DPIs) - and nebulizers,) for treating COPD³³. Inhaled beta-agonists alone were considered first-line medication, having been selected by 53% of physicians. Antibiotics were also noticed as a major preventative therapy to reduced COPD. Several studies have supported the use of antibiotics^{19,34}. Oral antibiotics were the drug therapy of first choice 63% of the time. Thus, it has been proved by the present study the medicines which were usually prescribed for COPD has been shown also prescribed in other regions.

Conclusion

COPD is one of the leading causes of mortality. COPD can be minimized by reducing the risk factors like smoking, dust, pollen, α -1 antitrypsin (AAT) deficiency, lung infections, and air pollution. Major guidelines have been provided by various societies to prevent and treat COPD like British Thoracic Society, The Americans Thoracic Society, and European Respiratory Society. Smoking is one of the main factors and cessation of smoking can reduced the chances of COPD many folds. The medicines which are normally prescribed to treat or decrease the worsen condition of COPD patients included short and long acting bronchodilators as initial therapy, oxygen therapy aid in the reduction of shortness of breath surgery has also been recommended, bronchodilators short acting or long acting β -2-agonists, corticosteroids and antibiotics. The prevalence of COPD is varied in all over the world. Thus, it has been concluded that COPD can be treated or managed not only by medicines but the healthy person should have to take preventive measurements to reduce the prevalence of COPD.

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.