

Chronic Obstructive Pulmonary Disease (COPD) and Associated Comorbidities: An Overview

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ABSTRACT

COPD is a disorder which involves certain phenotypes, the continuum of which remains under noticed. COPD will be third leading cause of death worldwide. The most important risk factor is the active smoking, but other factors also under noticed such as occupational factors, some infections and the role of air pollution. Country, age and sex ratios change its prevalence rate. Age and smoking are common risk factors and illnesses, leading COPD patients to demonstrate multiple coexisting comorbidities.

Keywords: Chronic obstructive pulmonary disease, epidemiology, mortality, MORBIDITY, (CIGARETTE) SMOKING.

Introduction:

COPD is a slowly progressing respiratory disorder that is characterized by an obstructive ventilator pattern that leads to coronary obstruction or failure, mainly due to tobacco smoking and unfortunately irreversible. It includes number of entities as follows:

1. Chronic bronchitis: permanent failure of pulmonary airways
2. Chronic respiratory failure: existence of chronic obstructive bronchitis followed by hypoxemia
3. Emphysema: which is characterized anatomically as destruction of alveolar sacs/ducts with an abnormal increase in the size of distal airways.

First the main cause is active smoking but it may consider, secondly it may cause due to environmental factors and genetic predisposition. It is a disorder that is still underdiagnosed. The presence of cough and sputum production identifies a group (in those > 40 yrs. and smoking >10 packs-yrs.) at risk of presenting COPDs. COPD leading to increase morbidity and mortality rates world widely among individuals exposed to biomass smoke. Statistics shows that in contrast with other major causes of death like cancer and cardio, there is upward trend in COPDs cases. (2)

Risk factors:

- exposure to tobacco smoke, active and passive smoking
- Occupational exposure to dusts and chemicals, exposure to fumes from burning fuels
- Genetic factors
- Age, sex
- Infections
- People with asthma, Bronchial Hyperactivity
- Social and economic factors

Comorbidities:

1. Respiratory comorbidities include,

- **Asthma:** It may involve airway inflammation that is associated with an abnormal inflammatory response of the lungs to noxious particles or gases.
- **Lung cancer:** The prevalence of COPD among patients with lung cancer varies from 40 to 70 percent. The annual chances of lung cancer is greater in COPD patients rather than general population.
- **Pulmonary fibrosis:** It has been classified as a distinct clinical entity (combined pulmonary fibrosis and emphysema syndrome). Simultaneously, gas exchange is impaired by both thickening of alveolar membrane in pulmonary fibrosis and reduction of vascular surface in emphysema. Combined effect of pulmonary fibrosis and emphysema may generate hypertension.

2. Cardiovascular Comorbidities:

- Hypertension: It is prevalent in COPD patients but have low risk of deaths.
- Congestive heart failure
- Coronary heart disease
- Atrial Fibrillation
- Pulmonary artery hypertension and subsequent right heart failure
- Venous thromboembolism
- Stroke

3. Metabolic comorbidities

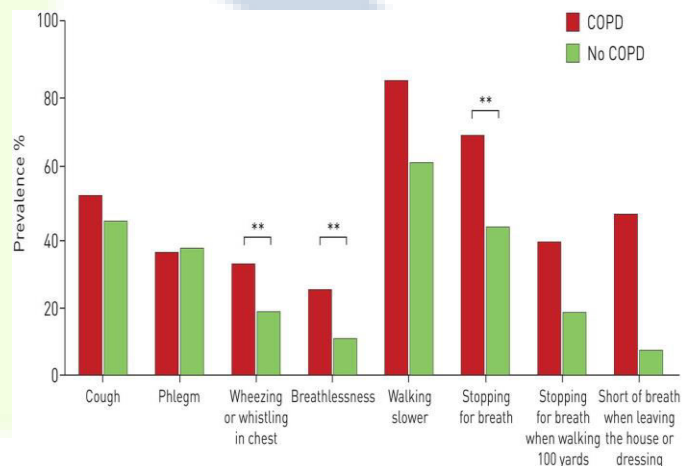
- Diabetes and metabolic syndrome
- Osteoporosis
- Cachexia and myopathy

4. Mental comorbidities

- Anxiety and depression

5. Other comorbidities

- Obstructive sleep apnea syndrome
- Gastroesophageal reflux disease
- Chronic renal failure



Transmission and Pathogenesis

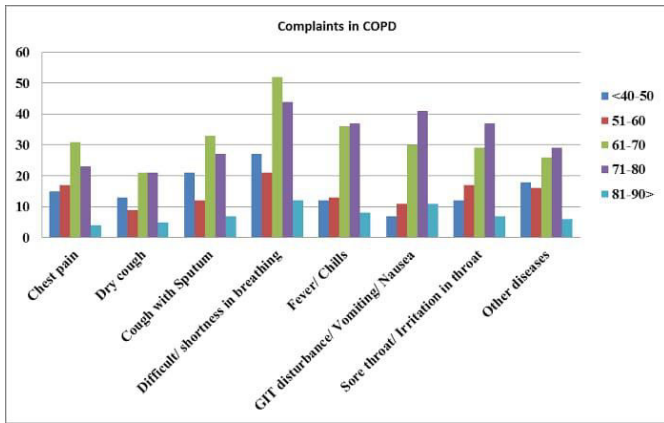
Tobacco smoking remains the main cause of COPD worldwide, its pathogenicity does not survive only on one compound it may include, aside from nicotine, heavy metals, tobacco smoke and carcinogens lead to significant exposure to oxidants. These include alkyl, alkyl and peroxide free radicals, N₂O, nitric oxide.

Clinical signs and symptoms

An enzyme helps to protect your lungs from inflammation damaging (AAT: **alpha 1 antitrypsin**) its deficiency causes an inherited disorder that can lead to emphysema. AAT deficient patients are more prone to infections from exposure to smoke and dust.

Symptoms of COPD are listed below:

- SOB (like walking or using the stairs)
- Wheezing
- Shortness of breath performing regular activities
- Cough with mucus that persists for long time period.
- Chest tightness
- Lack of energy (unintended weight loss)
- Swelling in ankles, feet or legs.
- Frequent respiratory infections
- Chronic cough that may produce mucus(sputum)
- COPD experience episodes called exacerbations.



Diagnosis and tests:

Some tests must be performed in order to assess your lung and health history such as;

- Medical history
- Spirometry: simple lungs test to evaluate that how well your lungs work
- Pulse oximeter: measures oxygen level in your blood
- Atrial blood gases (ABGs): measures O2 and CO2 levels
- Electrocardiogram (ECG/EKG): checks heart function and rules out heart disease as a cause of SOB
- Chest X-ray CT scan: imaging tests for lung changes that leads to COPDs
- Exercising Test: measures the dropping level of O2 in the blood during exercise

Treatment and management:

The management and treatment of COPD is usually based on GOLD (Global initiative for chronic obstructive lung disease).COPD treatment focuses on relieving symptoms like coughing, breathing problems and respiratory infections through:

Bronchodilators that help you to breathe easier and relax airways.

Anti-inflammatory medications: these are used to lower inflammation in the lungs.

Supplemental oxygen: these are used to improve oxygen level, Hypoxemia.

Antibiotics: lung infections increased in case of COPD, so in order to protect from bacterial infection, one must add antibiotics.

Vaccinations: Respiratory infections during COPD are more dangerous, in order to prevent from the shots of flu and pneumonia, vaccinations play an important role.

Anticholinergics: These drugs work slowly and efficiently by relaxing the muscle bands that tightens around the airways and help clear mucus from the lungs. With the airways open, the mucus can easily cough out, because relaxed muscles let more air in and out.

Leukotriene modifiers: leukotrienes are naturally occurring chemicals that cause tightening of airway muscles and production of fluid and mucus in the body. Leukotriene modifiers block the chemicals and minimize these reactions.

Expectorants: These helps to thin the mucus in the airways and ease coughing.

Antihistamines: These provide relieve from watery eyes, stuffy heads and sneezing.

Antivirals: These are basically directed to prevent the influenza virus.

Prevention:

Diet: balance diet and nutrition helps the body to fight against infection or to prevent from infections Findings suggest that keep fewer carbohydrate consumption and more fats helps them breathe better, because amount of CO2 produced during food metabolism. Other than stay hydrated (at least 6-8glasses/day), added more fluids in diet may be supportive for COPDs.

Other general health guidelines: avoid eyes rubbing, as they can transmit germs to nasal airways via tear ducts. Reduced exposure to the environment that have poor air quality, dust, smog, fumes etc. Smoking cessation programs may be beneficial for a safe society.

Conclusion

COPD is a severe cause of inflammation of lungs that can lead to death, because it is a group of disease or a disorder that can be managed but cannot cured. Managing it is also crucial to protect the human lives. Effective control measures, including prevention of smoking, factories at residential areas, fires are keys to preventing and managing the spread of COPD. COPD as well as asthma are costly diseases for the society.

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