

## Chronic Obstructive Pulmonary Disease (COPD)

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### Editorial

Chronic obstructive pulmonary disease (COPD) is an inflammatory disease characterized by progressive decline in lung function accompanied by airway narrowing due to inflammation, fibrosis and mucus plugging, associated by parenchymal destruction with loss of elasticity, gas exchange surface area, and airway support with subsequent early airway closure [1]. COPD affects more than 400 million people worldwide. The prevalence rate of COPD is highly variable ranging from 0.2% in Japan to 37% in the United States. According to the 12-site Burden of Obstructive Lung Disease (BOLD) study, the average prevalence of COPD is 10.1%, with wide variations [2]. COPD is predicted to become the fourth leading cause of death and the fifth commonest cause of disability in the world by 2030 [3].

Tobacco smoking and environmental pollution are the most well known risk factors for COPD. Most patients presented by dyspnea and exercise intolerance due to deranged lungs and impaired peripheral oxygenation to the skeletomuscular system and mitochondria [4]. The progressive course of COPD is accelerated by acute exacerbations, which are episodes of worsening of symptoms, which are the most frequent cause of hospitalizations and death among COPD patients [5,6]. Evidence suggests that ≥50% of acute exacerbations are due to bacteria requiring treatment with an antibiotic which should have high activity against the causative pathogens [7].

Patients with abnormal pulmonary inflammation characterized by increased number of inflammatory cells (neutrophils, macrophages, and T-lymphocytes) and the release of multiple inflammatory mediators such as: lipids, chemokines, cytokines, and growth factors [8,9]. The involvement of genetic factors in the pathogenesis of COPD was proved through the observation that individuals with severe deficiency for alpha-1-antitrypsin, a major inhibitor of serine proteases, have an increased risk of developing COPD [10]. The main causes of deaths in COPD patients were cardiovascular diseases (mainly heart attack and stroke), exacerbations and lung cancer (more than 75%) [11].

A diagnosis of COPD should be considered in persons having chronic symptoms of cough, sputum production, shortness of breath, and/or wheezing, especially among those with prolonged exposure to risk factors for the disease. Forced expiratory time (FET) of more than six seconds is suggestive of airflow obstruction [12]. Also significant decreased superoxide dismutase 3 and increased ferroxidase activity, surfactant protein D, glutathione peroxidase, and C-reactive protein levels were found in subjects with COPD [13]. Triple combination therapy involving long-acting muscarinic antagonists long-acting β<sub>2</sub> agonists, and inhaled corticosteroids has recently become an option for

maintenance treatment of COPD [14]. *Rhodiola crenulata* has been shown to exert anti-inflammatory effects and to enhance exercise endurance thereby having the potential to treat COPD [15].

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