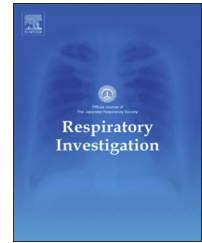




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Review

Prevalence and burden of comorbidities in Chronic Obstructive Pulmonary Disease

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ABSTRACT

The classical definition of Chronic Obstructive Pulmonary Disease (COPD) as a lung condition characterized by irreversible airway obstruction is outdated. The systemic involvement in patients with COPD, as well as the interactions between COPD and its comorbidities, justify the description of chronic systemic inflammatory syndrome. The pathogenesis of COPD is closely linked with aging, as well as with cardiovascular, endocrine, musculoskeletal, renal, and gastrointestinal pathologies, decreasing the quality of life of patients with COPD and, furthermore, complicating the management of the disease. The most frequently described comorbidities include skeletal muscle wasting, cachexia (loss of fat-free mass), lung cancer (small cell or non-small cell), pulmonary hypertension, ischemic heart disease, hyperlipidemia, congestive heart failure, normocytic anemia, diabetes, metabolic syndrome, osteoporosis, obstructive sleep apnea, depression, and arthritis. These complex interactions are based on chronic low-grade systemic inflammation, chronic hypoxia, and multiple common predisposing factors, and are currently under intense research. This review article is an overview of the comorbidities of COPD, as well as their interaction and influence on mutual disease progression, prognosis, and quality of life.

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1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is characterized by systemic involvement and multiple comorbidities. The incidence of these comorbidities increases later in life, decreasing the quality of life of patients with COPD, as well as complicating the management of the disease. The most frequently described comorbidities include skeletal muscle wasting, cachexia (loss of fat-free mass), lung cancer (small cell or non-small cell), pulmonary hypertension, ischemic heart disease, hyperlipidemia, congestive heart failure, normocytic anemia, diabetes, metabolic syndrome, osteoporosis, obstructive sleep apnea, depression, and arthritis [1,2]. Apart from these comorbid conditions, there are data suggesting that a significant number of other medical problems are seen more frequently among patients with COPD, and professional healthcare providers must be aware of them [3].

It is estimated that 80% of COPD patients are likely to have at least one comorbidity [4,5]. Dal Negro and coworkers reported that one comorbidity of clinical relevance was detected in 78.6% of patients with COPD, at least two in 68.8%, and three or more were found in 47.9% of subjects [6]. Besides that, the incidence of diabetes, hypertension, and hyperlipidemia increases with the severity of COPD. For

instance, diabetes was found in 4% of patients in GOLD (Global Initiative for Chronic Obstructive Lung Disease – a classification of COPD severity) Group A, in 16% of those in GOLD B, and in 29% of those in GOLD D. Similarly, hypertension was found in 38% of patients in GOLD A, in 55% of those in GOLD B, and in 65% of those in GOLD D; hyperlipidemia was found in 13% of patients in GOLD A, in 30% of those in GOLD B and in 37% of those in GOLD D [7].

This article is an up-to-date review of the prevalence and disease burden of the comorbidities that are often associated with COPD, as well as their interaction with, and impact on, COPD exacerbations.

2. COPD and comorbidities

2.1. COPD and cardiovascular diseases

COPD is characterized by low-grade systemic inflammation, probably resulting from spillover of multiple pro-inflammatory markers into the circulation, and thus has a role in the development or acceleration of cardiovascular disease (CVD). Indeed, COPD patients have a two to five times higher risk of coronary artery disease, cardiac dysrhythmia,

Abbreviations: ACS, acute coronary syndrome; AECOPD, acute exacerbation of Chronic Obstructive Pulmonary Disease; AF, atrial fibrillation; APACHE, acute physiology and chronic health evaluation; BMI, body mass index; BODE, BMI, obstruction, dyspnea, exercise capacity; CABG, coronary artery bypass grafting; CACS, coronary artery calcification score; CICAD, coronary artery disease; CI, confidence interval; CODEx, comorbidity, obstruction, dyspnea and previous exacerbation; COMCOLD, comorbidities in chronic obstructive lung disease; COPD, Chronic Obstructive Pulmonary Disease; COPDCoRi, Chronic Obstructive Pulmonary Disease Coronaropathy Risk; COTE, COPD-specific comorbidity test; CT, computerized tomography; CVD, cardiovascular disease; DECAF, dyspnea score, eosinopenia, consolidation, academia and atrial fibrillation; ESMI, EPOC en Servicios de medicina interna; FEV1, forced expiratory volume in one second; GERD, gastroesophageal reflux disease; GI, gastrointestinal; GOLD, Global Initiative for Chronic Obstructive Lung Disease; HbA1c, glycated hemoglobin; HF, heart failure; HPA, hypothalamic-pituitary-adrenal axis; HR, hazard ratio; IgG, immunoglobulin G; IL, interleukin; MS, metabolic syndrome; MRC, Medical Research Council; mMRC, modified Medical Research Council; T2DM, type 2 diabetes mellitus; T3, triiodothyronine; TSH, thyroid stimulating hormone

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