Management of COPD Exacerbations

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INTRODUCTION

The natural history of chronic obstructive pulmonary disease (COPD) frequently includes intermittent episodes of symptomatic worsening. According to the guidelines of the Global Initiative for Chronic Obstructive Lung Disease (GOLD), when these episodes exceed typical daily variability and require adjustment in medication they are classified as exacerbations of COPD. Symptoms may include dyspnea and cough that exceed baseline symptoms as well as changes in sputum volume and purulence. Beyond these hallmarks of disease, physical examination may demonstrate tachycardia or tachypnea, and patients may describe wheezing, chest pain, fatigue, malaise, or confusion. Finally, pulmonary function testing may demonstrate acute changes in physiologic functioning, but such findings are not consistent enough to be useful in routine diagnosis and management. While patients may attempt to self-manage milder exacerbations outside the awareness of physicians, these incidents still exact a toll on pulmonary function, thus increasing the need for attention to early diagnosis and treatment of these episodes.

IMPACT OF EXACERBATIONS: COST AND EFFECT

The National Heart, Lung and Blood Institute estimates that the direct cost of COPD to the United States in 2010 exceeded $29 billion. Unsurprisingly, the largest portion of this cost has been attributed to exacerbations of disease. Some exacerbations are associated with worsening in spirometry that fails to recover after resolution of the acute event. Furthermore, patients with frequent exacerbations have more rapid declines in forced expiratory volume in the first second (FEV₁) than those without. As a result, these episodes diminish quality of life and decrease productivity, further increasing both the financial and emotional costs of COPD.

Exacerbation severity may be conceptualized using a “health care utilization” approach. In this way, one may describe mild to moderate exacerbations as those necessitating outpatient therapy while severe exacerbations require hospitalizations. These severe exacerbations tend to have a poorer prognosis and worse outcomes. During periods of exacerbation (and with treatment), alteration in the lung microbiome may lead to variability in the immunological milieu of the airways.