A Historical Perspective on Chronic Obstructive Pulmonary Disease: From Past to Present

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ABSTRACT

René-Théophile-Hyacinthe Laennec in his book “Treatise of the Diseases of the Chest” discussed the emphysema in 1821. Chronic obstructive pulmonary disease (COPD) has been around for at least 202 years, from 1821 to 2023 (but the disease itself is much older than that). It is believed that William Briscoe first used the term COPD in June 1965, at the 9th Aspen Emphysema Conference. COPD was first defined by the CIBA guest symposium in 1959 and the American Thoracic Society Committee on Diagnostic Standards in 1962; recent definition of COPD was released by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) report 2023. In 1990, it was sixth leading cause of death and in 2020 COPD becomes third leading cause of death. GOLD update 2023 also proposed taxonomy (etiotypes), classification of COPD based on risk factors, and ABE assessment tool for COPD. New concept of early-COPD, pre-COPD, and mild-COPD are also emerging, which are helpful in better understanding of COPD. Here, we have discussed historical landmarks, definition, burden, taxonomy, classification, different concept of disease, ABE assessment tool, personalized medicine, and brief description of GOLD and World COPD Day from past to present.

INTRODUCTION

Earlier in 1821, RTH Laennac, a physician, pathologist, and the inventor of the stethoscope wrote a magnificent description of the emphysema component of disease in “Treatise of the Diseases of the Chest.” He meticulously dissected patients he had previously studied and found that the lungs of people with emphysema were hyperinflated and did not empty well. From 1821 to 2023, it is 202 years of history of chronic obstructive pulmonary disease (COPD)—the albeit disease is older than that. After this, John Hutchinson invented the spirometer (which measures vital lung capacity) in 1846. Two of these two instruments (stethoscope and spirometer) played a major role in the understanding of COPD. Spirometry is still indispensable in COPD diagnosis. Chronic obstructive bronchopulmonary disease, diffuse obstructive pulmonary syndrome, chronic obstructive lung disease, nonspecific chronic pulmonary disease, and chronic airflow obstruction were additional acronyms that were used before the term “COPD” was coined. The term “COPD” is thought to have been coined by William Briscoe at the 9th Aspen Emphysema Conference in June 1965. As a result of this term’s widespread use, we now refer to this emerging health issue as COPD.

The main two traditional clinical diagnoses of COPD are chronic bronchitis (chronic cough with phlegm) and emphysema (small air sacs at the end of the lungs’ airways are destroyed). Due to the overlapping clinical, radiological, and pathological features of the two aforementioned conditions, COPD has come to be widely used to refer to both of them. The various clinical and pathological phenotypes, such as exacerbator, nonexacerbator, frequent exacerbator, emphysema-hyperinflation, asthma-COPD overlap, etc., that have been identified in the general population are advantageous to recognize given recent advancements in our understanding of COPD.

EARLY HISTORY OF COPD

The etiology of COPD is probably not recent. The condition that is currently known as COPD may have been referred to by other names in the past. Theophile Bonet first used the term “voluminous lung” in 1679. Further, in 1814 Charles Batham identified “chronic bronchitis.” Detailed landmarks of COPD are presented in Figure 1.

Definition of COPD

The first to define COPD was the CIBA guest symposium in 1959 and the American Thoracic Society (ATS) Committee on Diagnostic Standards (1962). Further, the ATS defined emphysema as “enlarged alveolar spaces and loss of alveolar walls, and chronic bronchitis as a chronic cough lasting at least 3 months for at least 2 years.” Recently, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) report 2023 characterizes COPD as “a heterogeneous lung condition characterized by chronic respiratory symptoms (dyspnea, cough, sputum production, and exacerbations) due to abnormalities of the Airways (bronchitis and bronchiolitis) and/or alveoli (emphysema) that cause persistent, often progressive airflow obstruction.”

Burdens of COPD

In 1990, COPD was the sixth dominant cause of death, and in 2002, it became the fourth major contributor to death across the globe. After 30 years (1990–2020), COPD became the top third disease killer worldwide. COPD causes 3.23 million deaths in the year 2019, as per World Health Organization (WHO). In low- and middle-income nations, COPD deaths in people under 70 years of age account for nearly 90% of all deaths. India leads the world in COPD prevalence, ranks second only to China in COPD deaths, and is rapidly catching up. COPD affects approximately 10% of people aged 40 and up, though the prevalence varies by country and increases with age. The global prevalence of COPD is 10.3%. Overall, burden of COPD is increasing across the globe (Fig. 2).

GENDER EQUALITY

Chronic obstructive pulmonary disease (COPD) was previously thought to be a male-dominated respiratory disease. However, since 2008, the number of women with COPD has been the same as the number of men with COPD; this is primarily due to the fact that more women worldwide smoke and use biomass fuels.

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History of COPD

The GOLD 2023 report proposes a taxonomy (six etiotypes) for COPD: (1) genetically determined COPD (COPD-G), (2) COPD due to abnormal lung development (COPD-D), (3) environmental COPD [cigarette smoking COPD (COPD-C)], biomass, and pollution exposure COPD (COPD-P), (4) COPD due to infections (COPD-I), (5) COPD and asthma (COPD-A), and (6) COPD of unknown cause (COPD-U).

Taxonomy (Etiotypes) of COPD

Classification of COPD on the Basis of Major Risk Factors

For >50 years, tobacco use has been a well-established risk factor for COPD. However, in the last 20 years, it has been proven that there are other risk factors besides smoking. Recently, the Lancet Commission on COPD classified COPD into five groups on the basis of risk factors—(1) genetically determined (α-1 antitrypsin deficiency and other genetic variants); (2) early-life event-related (prematurity and childhood asthma); (3) infection-related (childhood respiratory infections, tuberculosis, and/or human immunodeficiency viruses-associated COPD); (4) smoking/vaping-related (tobacco smoking and other types of smoking); and (5) environmental exposure-related (exposure to indoor and/or outdoor air pollution and occupational exposure).

The Concepts of Pre-COPD and Early-COPD

An entirely new notion, pre-COPD, analogous to prediabetes and prehypertension, may be heralded by the discovery of a marker for the development of COPD. Key areas in clinical research on COPD include the characterization of individuals who are at risk, screening, early diagnosis, and management of the risk. Patients with no airway obstruction (forced expiratory volume (FEV1)/forced vital capacity ≥ 0.71) but a high risk of developing COPD are considered to be in the pre-COPD. Despite not meeting the criteria for COPD, these people may be experiencing early
pathological alterations in their lungs or a rapid reduction in lung function. Early COPD means an interval in time at the beginning of the disease course. This initial stage may occur late in life, for instance, in a person with a natural history of normal lung function who suddenly has a severe decline in lung capacity. Pre-COPD (which may happen at any age) is not the same thing as early COPD, which is the biological beginning of the disease and is very difficult to diagnose in an individual patient. This contributes to the common misunderstanding that “early” COPD is similar to “mild” COPD. There is not a one-to-one correspondence between “mild” COPD and “early” COPD, as “early” relates to disease progression while “mild” denotes the disease’s degree. The term “early” refers to the pathophysiological alterations that occur early in a disease’s natural history, and its use indicates an intent to create effective measures to halt the disease’s progression and cut mortality rates.

**World COPD Day**

Since 2002, WCD has been held on the ‘third Wednesday in November’ and is coordinated by GOLD and the WHO. The 21st WCD, with the theme “Your Lungs for Life,” will take place on 16th November 2022. The day is one of the most significant global occasions for COPD awareness and education, with organizers hosting events in >50 nations annually. It is planned in conjunction with medical experts and COPD patient organizations from around the world. Its purpose is to spread knowledge, increase awareness, and discuss solutions to the global COPD problem. GOLD selects a subject for WCD each year and organizes the creation and distribution of information and resources. Healthcare workers, educators, and members of the public who wish to make a difference locally and globally arrange WCD activities in each nation.

**Conclusion**

Empysema and chronic bronchitis research spans centuries. Due to the lack of elastic rebound and increased airflow resistance via the complex conducting system of the lungs, evidence suggests that an attack on the alveoli and both large and small airways might produce chronic and irreversible airflow limitation. For treatment, it is necessary to stop smoking and other risk factors. These methods prevent blood gas homeostasis and premature ventilatory dysfunction. In addition to quitting smoking, symptomatic sickness necessitates the use of bronchodilators and sometimes corticosteroids. Oxygen and pulmonary rehabilitation are beneficial to patients. Lung volume reduction surgery enhances elastic recoil in a subset of patients, improving airflow and perfusion, and reducing dyspnea and gas exchange issues. For some people, lung transplantation is beneficial. In the future, early disease identification and treatment are required. Personalized treatment may be used in COPD due to its complexity and heterogeneity. The main diagnostic tool must be spirometry. Alveolar injury and airway inflammation must be minimized by newer therapies in future. GOLD is doing great job in overall management of COPD in the world. We conclude that the future of COPD research, prevention, and therapy looks bright.

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**References**