

Bronchial Diseases are Insufficiently Defined with the Term COPD

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Abstract: This paper discusses the basic thoughts behind the so-called diagnosis of COPD in relation to cause and course of the disease and questions the value of this functional defined terminology. Instead, the terminology should be based on morphology in the broadest sense including all methods suitable to describe pathological processes to understand the cause of bronchial diseases. The diagnosis COPD is only helpful in relation to therapeutic measures.

Keywords: COPD, asthma, bronchitis, terminology of diseases, understanding of diagnostic terms

Only rarely does the importance of terminology and the form of diagnoses for the scientific structure of medicine undergo reconsideration. Diagnoses are themselves guiding components in medicine, and are used in many areas both inside and outside the discipline, be it for statistical purposes, for epidemiological studies, as a basis for guidelines and of course as a basis for diagnostic and therapeutic measures on patients. This means that diagnoses should be based on a clear conception of the disease and its cause or development, although this is by no means the general case. In a partly empirical science such as medicine, the terms in use are of very different value and often do not follow a systematic approach. They may therefore be ambiguous, without causing any undue disruption in their daily use. In addition, the conceptual quality of the respective terms and the knowledge they convey may frequently be unclear. Diagnoses may have a clinically descriptive basis, such as headaches, a pathological-anatomical basis as in coronary heart disease, a functional basis as in diarrhoea, a pathogenetic basis as in systemic diseases, SLE, etc. and an aetiological basis as in infectious diseases. Scientific medicine always tries to establish a concept based on the aetiology or at least the pathogenesis of a disease. Unfortunately, this target is not always met.

This article questions the meaning and quality of the diagnostic term COPD and examines whether the diagnosis of COPD from the perspective of medical science actually hinders progress towards knowledge of the pathogenesis and treatment of bronchial diseases.

JG Scadding is one of the very few people who have dealt with questions of medical terminology.¹ He points out that the more precisely the terms – diagnoses – are chosen and the more information they implicitly contain, the more efficiently they will reflect our knowledge; otherwise, they will be just as effective in disguising our ignorance.² Laennec pointed out this problem some 200 years ago:

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“Nothing hinders scientific progress more than imprecise use of terms, or the creation of bad new terms” (as quoted in 2). Above all, it is important that a term should describe only one single fact, which does not apply in the case of COPD, as is explained below.

Diseases are not always the same as the diagnoses and nosological terms used in medicine. A disease includes a subjective sensation experienced by the individual, also known as individual suffering, which is also reflected in but may extend beyond the symptoms of the disease. Although latent tuberculosis is symptomless, it can be threatening when considered objectively. JG Scadding has pointed out the different intellectual levels which should underlie a diagnosis or understanding of a disease.^{3–6} He makes it clear that it is essential to add causes or at least morphological findings to the diagnostic terms in daily use, as far as they are known, in order to obtain a clear definition of the condition in question.⁴ From the layman’s point of view diagnoses are often understood as truths set in stone, but even in the scientific environment, terms for disease are often used indiscriminately with little regard for the value of their content.

Medical terminology based on science not only serves to classify diseases, but also promotes understanding of the process of the disease. Diagnoses that merely name symptoms such as back pain, hypertension or headaches give no information about the cause and mechanisms or diagnostic procedures. They do not describe any disease entities but are easy to understand in operational use, mostly to facilitate communication in everyday clinical practice or to provide therapeutic guidelines. However, this approach, which is legitimate in practice, reaches its limits where these diagnoses are to form the basis for a scientific understanding of the disease process, as is the case in trials, for example. Medical research is aimed at finding the causes of a disease and then naming them, which often leads to new definitions or concepts.⁴

Diagnoses that describe a functional disorder, such as heart failure or pulmonary obstruction, are useful for therapeutic considerations, but say little about the origin, course or prognosis of a disease process because they name the result of a disease process but not its cause. Dysfunctions that are used as diagnoses always require an additional explanation of aetiology or pathogenesis if they are to form the basis for research projects; otherwise it becomes necessary to formulate special artificial situations that may sometimes appear illogical.

Scadding’s ideas^{3,4} are not only of theoretical importance, they are essential for research and for the daily work at the bedside, because they indicate the level of certainty in the diagnostic or therapeutic work of the attendant physician. Unfortunately, international classifications of diseases do not take these important theoretical considerations into account.

The problem of functionally formulated diagnoses becomes particularly clear in the diagnosis of COPD, where the functional disorder of obstruction is the defining factor. However, the terminology – diagnosis – COPD is inconsistent. Curiously, according to general agreement, which has yet to be substantiated, not all obstructive pulmonary dysfunctions are included under this term of disease, because it explicitly excludes asthma, a disease with pronounced obstruction, and tracheal diseases caused by tumours or cartilage disorders. In addition, the diagnosis of COPD includes such widely different conditions as bronchitis and emphysema, without making any distinction between them. On the other hand, this diagnosis does not include bronchial diseases without obstruction. From an operational point of view, the therapy is similar in all forms, which may simplify the practitioner’s task. From a scientific point of view, however, it considerably diminishes the aetiological and pathogenetic value and thus hinders deeper insights within this field. The term COPD is based on a symptom – obstruction – but does not contain any information about pathogenesis or prognosis of the disease. Nor does the term COPD contain any information about causes, such as smoking or infections. It is therefore not a term based on science but is related to therapeutic actions.

Until the 1980s, an inflammatory disease of the bronchial system was called chronic bronchitis, which is both pathologically and anatomically correct. The textbook by Crofton and Douglas,⁷ that on Pulmonary Pathology by Dail & Hammar⁸ or on Pulmonary Pathology by MS Dunnill⁹ did not know the term COPD. The problems of designating bronchial diseases with or without obstruction have occupied scientists for decades because the terminology also reflects and must reflect differing ideas about the origin and course.¹⁰ There is no doubt that COPD is a disease, but this term contains no further information than that. Instead, it is a purely therapeutic term and completely obscures the extraordinary diversity of bronchial and pulmonary diseases. Without wishing to trace the historical development of the term, I consider it astonishing that the poorly defined term of COPD has conquered

the medical world so quickly. It may be that the emergence of new therapeutic options has favoured combining bronchitis and emphysema into COPD. There has been strong support for the COPD approach, particularly in the USA, and this has been reflected in what is known as the GOLD initiative.^{12,13} An early move towards COPD came from the publication by B Burrows.¹¹ There is no question that the term COPD although insufficiently defined, has made a significant contribution to therapy.¹⁴

For some authors, this therapeutic concept of COPD has lost its persuasive power in recent years.^{14,15} The terminological approach to COPD is too simple to capture the diversity of the development and course of bronchial diseases. Attempts to characterise different phenotypes have failed because the result of the disease, the obstruction, has dominated the terminology and thus the way of thinking. Even studies that question the basic diagnosis of COPD¹⁶ and examine the problems associated with this diagnosis in detail do not touch on the concept of COPD. The scientific weakness of the COPD concept is made particularly clear by the new term asthma-COPD-overlap syndrome.¹⁷ The critical point is that it retains the dysfunction as a decisive feature and lacks any tendency to differentiate between diseases.^{18,19}

Although it has been clear from the very beginning of scientific research into bronchial diseases that inflammatory bronchial diseases can be accompanied by obstruction, this functional disorder was always considered a symptom of bronchial disease at the time, but not a criterion for defining the disease.^{10,20} The diagnostic term was bronchitis, possibly chronic bronchitis. As a preceding bronchial disease is usually the cause of an obstruction, it is nosologically more convincing to address this basic disease and to add the obstruction to the diagnosis. The obstruction is a frequent but by no means constitutive symptom of bronchial inflammation. Moreover, the extent of the inflammation varies greatly and there is no doubt that there are inflammations in the bronchial system that are not accompanied by an obstruction, such as in the context of viral infections or systemic or concomitant diseases²¹ or also in smokers.^{22,23} These conditions are not covered by the diagnosis of COPD as well as systemic inflammatory processes in bronchial diseases. This also applies to patients with respiratory symptoms but who still have normal lung function.¹⁶ Finally, there are obstructions that are completely without bronchial inflammation and have a purely mechanical cause, such as in the case of

cured tuberculosis, panacinar emphysema or tumours in the tracheobronchial system. These few examples may suffice to illustrate that the obstruction is unsuitable as a diagnostic parameter for inflammatory diseases of the bronchial system.

The diagnosis of COPD does not in any way meet the logical requirements of a scientific name for a disease and thus hinders scientific research by the absence of pathological-anatomical or pathogenetic concepts.

COPD serves as an example that it makes little sense to use dysfunctions as separate diagnoses, which undoubtedly also applies to other dysfunctions. Since such terms are worthless without explanatory additions that give indications of aetiology and pathogenesis, it is better to refer to the latter and to add the dysfunction, if it exists, if necessary with an assessment of the degree of the disorder. The basis for a substantiated diagnosis must be a recordable alteration in tissue in the wider sense that includes morphology, molecular biology, functions, infections, etc. The examination of pulmonary secretions, such as sputum or bronchoalveolar lavage, must be conducted more scientifically. Better biomarkers to classify specific pathogenetic mechanisms and individual patients are absolutely necessary.²⁴ Similarly, radiological techniques, which have greatly improved recently, will be able to show different morphologies.^{25–29} The development of differentiated biochemical or molecular biological methods as well as genetic studies³⁰ can contribute to an increasing characterisation of different phenotypes, as can differentiate immunological or bacteriological methods, and studies of the histology of the bronchial mucosa. On the other hand, approaches to describe different phenotypes according to the criteria of clinical practice³¹ will presumably not allow precise classification, since obstruction, as a one-dimensional functional disorder, does not reflect the multidimensional aetiological and pathogenetic causes of bronchial disease. Such a classification is also destined to fail because the result of the disease, which alone could differentiate between different forms of progression, is predetermined in the diagnosis of COPD. In an editorial, Hynes and Pavord³² point out the danger of taking unfounded diagnoses such as asthma-COPD-overlap syndrome as a fact without presenting a pathogenetic basis or a recognisable uniform mechanism. The demand by Postma et al¹⁰ to characterise patients with bronchial diseases as precisely as possible, using all available methods, is still the order of the day and is also shared by other authors.³³

A return to the process of disease in the organ would reverse the current trend by returning the focus to the causality of the bronchial diseases.

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