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SHORT REPORT

The need for a new classification system in chronic obstructive pulmonary disease

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ABSTRACT

The need for a new classification system in chronic obstructive pulmonary disease

The current classification fails to fully meet the needs of physicians and COPD patients in clinical practice. The future classification should aim to prevent the development of disease in high-risk groups, enable early diagnosis before irreversible damage occurs, identify subgroups, and provide pathophysiological insight to inspire drug development. It would be reasonable to thoroughly examine and assess the contributing factors such as an increase in the annual decline of (FEV_1), bronchial hyperresponsiveness, variable obstruction, FEV_1 % predicted, blood eosinophil count, preserved ratio impaired spirometry (PRISm), and the subgroups of group B as potential additions to the new classification.

Key words: *COPD; classification; early diagnosis*

ÖZ

Kronik obstrüktif akciğer hastalığında yeni bir sınıflama sistemi ihtiyacı

Kronik obstrüktif akciğer hastalığı (KOAH)'ta mevcut sınıflama hastaların ve hekimlerin klinik pratikteki ihtiyaçlarını tam olarak karşılayamamaktadır. Yeni sınıflamadan beklentiler arasında, yüksek riskli gruplarda hastalık gelişiminin önlenmesi, geri dönüşümsüz hasarlar oluşmadan erken teşhis konması ve alt grupların belirlenmesi ayrıca patofizyolojik mekanizmaları içermesi ve yeni ilaç geliştirilmesi için ilham verici olması sayılabilir. Yeni sınıflandırma için birinci saniyedeki zorlu ekspiratuar hacmin (FEV_1) yıllık düşüşünde artış, bronşiyal aşırı duyarlılık, değişken obstrüksiyon, beklenen FEV_1 yüzdesi, kan eozinofil sayısı, korunmuş oran bozulmuş spirometri (PRISm), grup B'nin alt grupları gibi faktörleri araştırmak ve değerlendirmek potansiyel olarak faydalı bir strateji olabilir.

Anahtar kelimeler: *KOAH; sınıflama; erken tanı*

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The need for a new classification system in chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a heterogeneous lung condition characterized by chronic respiratory symptoms

due to airways and/or alveoli abnormalities that cause persistent and often progressive airway obstruction (1). The current classification does not fully meet the needs of physicians and COPD patients in clinical practice. The expectations of the new classification include the prevention of disease development in high-risk groups, early diagnosis before irreversible damage occurs, identification of subgroups, and providing pathophysiological insight thus inspiring drug development. Additionally, all patients should receive optimal pharmacological and non-pharmacological treatment to minimize symptoms and risks and improve prognosis. The classification system should also be capable of predicting mortality risk and working to reduce it. While there may be some inconsistencies in the research, it could be a reasonable strategy to explore and assess factors such as "increase in the annual decline of forced expiratory volume in 1 second (FEV_1), bronchial hyperresponsiveness (BHR), variable obstruction (VO), FEV_1 % predicted, blood eosinophil count, preserved ratio impaired spirometry (PRISm), the subgroups of group B" may be part of the new classification.

As the Lancet Commission suggested, late diagnosis of COPD, lack of predictive biomarkers, and under-recognized clinical symptoms are some of the major challenges in detecting the disease early (2). A more comprehensive diagnostic approach to COPD may enable early detection and potentially change its course before irreversible pathological changes occur. The definition of obstruction should consider individual variability and a pathological process involving simultaneous loss of FEV_1 and forced vital capacity (FVC), defined as PRISm. Additionally, spirometry underestimates emphysema and airway disease visible on computerized tomography (CT) scans (2).

Expanded COPD diagnostic criteria proposed based on COPDGene study results may also guide the new classification of the disease (3). The hypothesis that spirometric criteria alone are inadequate to define the burden of smoking-related disease in this study. Eight categories were defined according to the four characteristics of COPD: 1. Exposure (the minimum exposure was a 10-pack-year smoking history), 2. Respiratory symptoms (dyspnea or chronic bronchitis), 3. Abnormal CT (emphysema, airway wall thickness, or gas trapping), 4. Abnormal spirometry (low FEV_1 or FEV_1/FVC). The COPDGene 2019 classification and hazard ratio for all-cause mortality according to categories are given in Table 1 (3).

The COPDGene study found that patients with definite COPD have a higher risk of all-cause mortality than those with probable COPD (3). It is suggested that managing probable COPD patients in the same way as those with definite COPD, where the mortality risk is lower, could be a good strategy to improve disease progression similar to idiopathic pulmonary fibrosis. Future clinical studies will reveal whether this approach alters the course of the disease. When considering risk factors in real life, it is important to go beyond smoking, which was the focus of the COPDGene study (3). Additionally, low FEV_1 was considered a spirometric abnormality regardless of the FEV_1/FVC ratio in the COPDGene

Table 1. All-cause mortality with the proposed COPDGene 2019 classification of categories (3)

COPDGene 2019 classification	Category	Characteristics	Hazard ratio for all-cause mortality (95% CI)*
No COPD	A	Reference category exposure (E) only	1.0 (ref)
Possible COPD	B	E plus CT abnormal	1.05 (0.76-1.44)
	C	E plus symptoms	1.55 (1.09-2.19)
	D	E plus spirometry abnormal	1.48 (1.03-2.12)
Probable COPD	E	E plus symptoms plus CT abnormal	1.90 (1.33-2.71)
	F	E plus symptoms plus spirometry abnormal	2.62 (1.84-3.72)
	G	E plus spirometry abnormal plus CT abnormal	1.76 (1.36-2.27)
Definite COPD	H	E plus symptoms plus spirometry abnormal plus CT abnormal	5.18 (4.15-6.48)

*COPD: Chronic obstructive pulmonary disease, CT: Computerized tomography.

study. However, this approach may reduce the specificity of the classification. In clinical practice, the FEV_1/FVC ratio could be used for classifying spirometric abnormalities, while low FEV_1 may be evaluated under the title of PRISm.

It is commonly believed that COPD is characterized by an increase in the annual decline of FEV_1. However, in more than half of the patients, the rate of decline in FEV_1 after three years of follow-up was not greater than that of individuals without lung disease according to data from the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) study (4). Although an increase in the annual loss of FEV_1 is linked to a poor prognosis, the factors that contribute to this decline are not fully known. In the ECLIPSE study, on the other hand, exacerbations had only a very modest effect with increased rates of decline in FEV_1 among current smokers, patients with bronchodilator reversibility, and patients with emphysema (4). Annual monitoring of FEV_1 in COPD patients is recommended to detect an early increase in decline, guide treatment, and improve prognosis.

In the Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2017 report, FEV_1 was excluded from the classification and pharmacological treatment decision due to its weak relationship with symptoms and insufficient ability to predict exacerbations and treatment response (5). The study analyzed cause-specific mortality in subpopulations with COPD in a cohort of around 340.000 people from the UK (6). The results were quite remarkable as patients with a lower FEV_1% were more likely to die within 30 days of an exacerbation and to die from COPD-related causes. It was also observed that patients were dying due to exacerbation, but especially those with low FEV_1 died after exacerbation. As a result, patients with a predicted FEV_1 percentage of< 30% should be considered high risk and should be taken into account in pharmacological treatment.

The term VO, in which the prebronchodilator FEV_1/FVC ratio is less than 0.70 but increases to 0.70 or more after inhaled bronchodilators. Researchers analyzed data from the subpopulations and intermediate outcome measures in COPD study (SPIROMICS) cohort by comparing participants with VO to reference participants without obstruction. The study found that individuals with VO had an average time of 1.95 years to develop COPD. On the other hand, 75.3% of those without VO did not develop COPD during the three-year follow-up period (7). The Swiss study on air pollution and its impact on lung diseases in adults (SAPALDIA) cohort study found that BHR is a risk factor for an accelerated decline in FEV_1 and the development of COPD in asymptomatic individuals. Furthermore, current smokers with BHR experience a particularly high loss of FEV_1 (8). When assessing risk groups and patients with COPD, considering BHR as an important factor could be valuable.

A hospital-based nationwide cohort study was conducted in Denmark, which involved 8.453 patients with group B. The patients were grouped as B0, meaning no exacerbation; and B1, meaning one moderate exacerbation during the previous year, and were followed for three consecutive years in 2008-2017 for the development of moderate and severe exacerbations and death. Group B1 was found more likely to experience subsequent exacerbations and death within three years (9). In the ECLIPSE study, 42% of group B patients who remained in follow-up at the end of three years were transferred to the high-risk groups (groups C and D). Further, group B also had the highest rate of patients with persistent systemic inflammation and at least one comorbidity in this study (10). Identifying high-risk groups within group B in the new classification and offering new treatment options may improve the course of the disease.

Finally, in group E, it is crucial to assess holistically the various conditions such as rapid FEV_1 decline, bronchial hyperreactivity, FEV_1< 30% predicted, severe cardiac comorbidity, and active smoking during diagnosis and follow-up. These conditions can be just as hazardous for the patient as the exacerbations. Identifying and treating these risk factors earlier may have a significant positive impact on the disease outcomes. In clinical practice, it may be more appropriate to adjust the initial treatment group based on the patient's symptoms and exacerbations during follow-up and to administer both initial and follow-up treatments based on the assigned groups. A new classification concept proposal for COPD is presented in Figure 1, further studies are needed in this area.

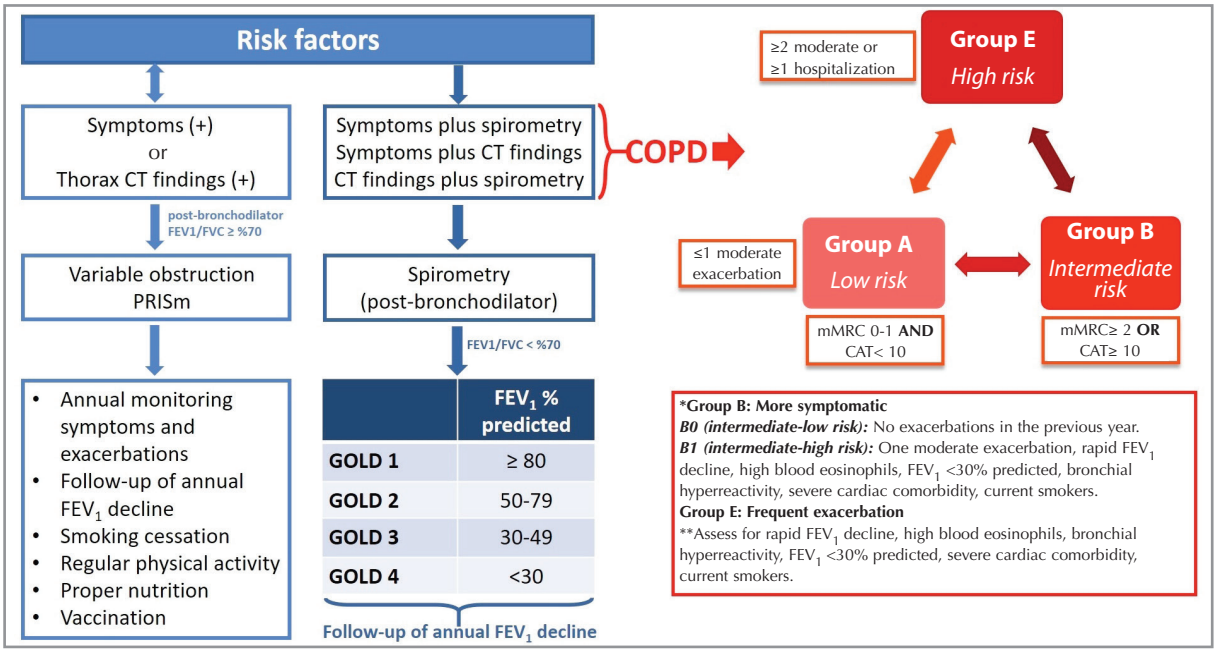

Figure 1. A new classification concept proposal for chronic obstructive pulmonary disease.

CONFLICT of INTEREST

The author have no conflict of interest to declare.

AUTHORSHIP CONTRIBUTIONS

Concept/Design: EEY

Analysis/Interpretation: EEY

Data acqusition: EEY

Writing: EEY

Clinical Revision: EEY

Final Approval: EEY

REFERENCES

1. *Venkatesan P. GOLD COPD report: 2023 update. Lancet Respir Med 2023; 11(1): 18. https://doi.org/10.1016/S2213-2600(22)00494-5*
2. *Stolz D, Mkorombindo T, Schumann DM, Agusti A, Ash SY, Bafadhel M, et al. Towards the elimination of chronic obstructive pulmonary disease: A lancet commission. Lancet Commision Lond Engl 2022; 400(10356): 921-72. https://doi.org/10.1016/S0140-6736(22)01273-9*
3. *Lowe KE, Regan EA, Anzueto A, Austin E, Austin JHM, Beaty TH, et al. COPDGene® 2019: Redefining the diagnosis of chronic obstructive pulmonary disease. Chronic Obstr Pulm Dis Miami Fla 2019; 6(5): 384-99. https://doi.org/10.15326/jcopdf.6.5.2019.0149*
4. *Vestbo J, Edwards LD, Scanlon PD, Yates J, Agusti A, Bakke P, et al. Changes in forced expiratory volume in 1 second over time in COPD. N Engl J Med 2011; 365(13): 1184-92. https://doi.org/10.1056/NEJMoa1105482*
5. *Vogelmeier CF, Criner GJ, Martinez FJ, Anzueto A, Barnes PJ, Bourbeau J, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive lung disease 2017 report. GOLD executive summary. Am J Respir Crit Care Med 2017; 195(5): 557-82. https://doi.org/10.1164/rccm.201701-0218PP*
6. *Whittaker H, Rothnie KJ, Quint JK. Cause-specific mortality in COPD subpopulations: A cohort study of 339 647 people in England. Thorax 2024; 79(3): 202-8. https://doi.org/10.1136/thorax-2022-219320*
7. *Buhr RG, Barjaktarevic IZ, Quibrera PM, Bateman LA, Bleecker ER, Couper DJ, et al. Reversible airflow obstruction predicts future chronic obstructive pulmonary disease development in the SPIROMICS cohort: An observational cohort study. Am J Respir Crit Care Med 2022; 206(5): 554-62. https://doi.org/10.1164/rccm.202201-0094OC*
8. *Brutsche MH, Downs SH, Schindler C, Gerbase MW, Schwartz J, Frey M, et al. Bronchial hyperresponsiveness and the development of asthma and COPD in asymptomatic individuals: SAPALDIA cohort study. Thorax 2006; 61(8): 671-7. https://doi.org/10.1136/thx.2005.052241*
9. *Løkke A, Hilberg O, Lange P, Ibsen R, Stratelis G, Licht SDF, et al. Disease trajectories and impact of one moderate exacerbation in Gold B COPD patients. Int J Chron Obstruct Pulmon Dis 2022; 17: 569-78. https://doi.org/10.2147/COPD.S344669*
10. *Agusti A, Edwards LD, Celli B, Macnee W, Calverley PMA, Müllerova H, et al. Characteristics, stability and outcomes of the 2011 GOLD COPD groups in the ECLIPSE cohort. Eur Respir J 2013; 42(3): 636-46. https://doi.org/10.1183/09031936.00195212*