Journal of Innovations in Medical Research and Clinical case Reports (JIMRCR)

OLITES PUBLISHERS
A Global Approach For Research

Open Access

Review Article

Bridging the Airway Divide: Understanding Asthma–COPD Overlap in Modern Respiratory Medicine

*** Andrinopoulou D, Fingleton E, Venegas W, Mammarappallil T, Macagno W, Nagata W**

Respiratory Medicine Department, National and Kapodistrian University of Athens, Greece

*** Corresponding Author:** Mammarappallil T, Respiratory Medicine Department, National and Kapodistrian University of Athens, Greece

Citation: Mammarappallil T, Bridging the Airway Divide: Understanding Asthma–COPD Overlap in Modern Respiratory Medicine V1(4), 2026

Received date: February 10, 2026: Accepted date: February 16, 2026: Published date: February 25 ,2026

Keywords: endothelial keratoplasty, visual rehabilitation, regenerative therapies, regenerative medicine, corneal regeneration, suture management, keratoprosthesis

Abstract

Asthma–Chronic Obstructive Pulmonary Disease (COPD) overlap represents a complex and clinically significant respiratory condition characterized by persistent airflow limitation combined with features of both asthma and COPD. This hybrid syndrome challenges traditional diagnostic boundaries and demands a nuanced understanding of its pathophysiology, risk factors, and treatment strategies. Patients with overlap often experience more frequent exacerbations, poorer quality of life, and increased healthcare utilization compared to those with either condition alone. This article explores the evolving concept of asthma–COPD overlap (ACO), highlighting its underlying mechanisms, diagnostic criteria, and current therapeutic approaches. Emphasis is placed on personalized medicine and the importance of early identification to optimize patient outcomes.

Introduction

Respiratory diseases remain a leading cause of morbidity and mortality worldwide. Among them, asthma and COPD are two of the most prevalent chronic airway disorders, each with distinct clinical and pathological features. However, a subset of patients presents with characteristics of both conditions, leading to what is now recognized as Asthma–COPD Overlap (ACO). This condition does not represent a single disease but rather a spectrum, complicating diagnosis and management.

Pathophysiology

Asthma is typically associated with reversible airway obstruction, eosinophilic inflammation, and hyperresponsiveness, whereas COPD involves irreversible airflow limitation, neutrophilic inflammation, and structural lung damage. In ACO, these mechanisms coexist:

- **Inflammatory Profile**: Mixed eosinophilic and neutrophilic inflammation
- **Airway Remodeling**: Thickened airway walls and reduced elasticity
- **Genetic and Environmental Factors**: Smoking, pollution, and genetic predisposition contribute to disease development

This overlap results in more severe airway dysfunction than either disease alone,

Risk Factors

Several factors increase the likelihood of developing ACO

- Long-term smoking or exposure to biomass fuels
- History of asthma in childhood
- Advanced age
- Occupational exposure to irritants
- Recurrent respiratory infections

Understanding these factors is crucial for early detection and prevention

Clinical Features

Journal of Innovations in Medical Research and Clinical case Reports (JIMRCR)

Patients with ACO often exhibit:

- Persistent airflow limitation
- Frequent exacerbations
- Chronic cough with sputum production
- Wheezing and shortness of breath
- Partial reversibility with bronchodilators

These overlapping symptoms make clinical differentiation challenging.

Diagnosis

There is no universally accepted definition for ACO, but diagnosis typically involves

- Spirometry showing persistent airflow limitation (FEV1/FVC < 0.70)
- Significant bronchodilator reversibility
- History of asthma or atopy
- Elevated eosinophil counts

A combination of clinical judgment and diagnostic testing is essential

Management Strategies

Treatment of ACO requires a tailored approach

Pharmacological Interventions

- **Inhaled Corticosteroids (ICS)**: Reduce inflammation
- **Long-Acting Beta-Agonists (LABA)**: Improve airflow
- **Long-Acting Muscarinic Antagonists (LAMA)**: Enhance bronchodilation

Combination therapy is often more effective than monotherapy.

Non-Pharmacological Approaches

- Smoking cessation
- Pulmonary rehabilitation
- Vaccinations (influenza and pneumococcal)
- Patient education and self-management plans

Challenges in Management

- Lack of standardized diagnostic criteria
- Limited clinical trials specifically targeting ACO
- Risk of overtreatment or undertreatment
- Variability in patient response

These challenges underscore the need for continued research.

Future Perspectives

Advancements in biomarker research and precision medicine hold promise for better classification and treatment of ACO. Identifying specific phenotypes may allow clinicians to tailor therapies more effectively, improving outcomes and reducing healthcare burden

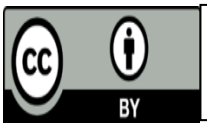
Conclusion

Asthma–COPD overlap represents a critical intersection in respiratory medicine, where traditional disease boundaries blur. Recognizing and understanding this condition is essential for effective management. With ongoing research and a shift toward personalized care, there is hope for improved diagnosis, treatment, and quality of life for affected individuals.

References

1. Suter, P.; Greig, R.; Chan, R.; Lipworth, B. Efficacy of Dupilumab and Mepolizumab in Eosinophilic COPD: Insights from Phase 3 Trials. Respir. Med. 2025, 248, 108343.
2. Svenningsen, S.; Kjarsgaard, M.; Haider, E.; Venegas, C.; Konyer, N.; Friedlander, Y.; Engel, R.; Shen, C.; Nair, P. Effects of Dupilumab on Mucus Plugging and Ventilation Defects in Patients with Moderate-to-Severe Asthma: A Randomized, Double-Blind, Placebo-Controlled Trial. Am. J. Respir. Crit. Care Med. 2023, 208, 995–997.
3. Ohtani, N.; Hara, E. Roles and mechanisms of cellular senescence in regulation of tissue homeostasis. Cancer Sci. 2013, 104, 525–530.
4. Sciurba, F.C.; Criner, G.J.; Christenson, S.A.; Martinez, F.J.; Papi, A.; Roche, N.; Bourbeau, J.; Korn, S.; Bafadhel, M.; Han, M.K.; et al. Mepolizumab to Prevent Exacerbations of COPD with an Eosinophilic Phenotype. N. Engl. J. Med. 2025, 392, 1710–1720.
5. Szabo, M.; Lagos, D.; Cross, E.; Collier, J.; Horvath, R. Mitochondrial DNA release and inflammation in mitochondrial disease pathogenesis. Brain 2026, awag037.
6. Van der Veer, T.; Andrinopoulou, E.-R.; Braunstahl, G.-J.; Charbonnier, J.P.; Kim, V.; Latisenko, R.; Lynch, D.A.; Tiddens, H. Association between Automatic AI-Based Quantification of Airway-Occlusive Mucus Plugs and All-Cause Mortality in Patients with COPD. Thorax 2025, 80, 105–108.
7. Nelson, G.; Kucheryavenko, O.; Wordsworth, J.; von Zglinicki, T. The senescent bystander effect is caused by ROS-activated NF-κB signalling. Mech. Ageing Dev. 2018, 170, 30–36.

Journal of Innovations in Medical Research and Clinical case Reports (JIMRCR)



DOI:10/JIMRCR/2026/018

.