



IMPACT OF COMORBING CARDIOVASCULAR DISEASES IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE ON THE PATHWAY, DEVELOPMENT OF COMPLICATIONS, AND EFFECTIVENESS OF TREATMENT

Nuritdinova Shahzoda Erkinjon qizi

Clinical resident at Central Asian Medical University
e-mail: nuritdinovashaxzoda2000@gmail.com

Kenjaev Olimjon Obidjonovich

Associate Professor of the Central Asian Medical University, PhD.

E-mail: olimjonkenjaev7@gmail.com

<https://doi.org/10.5281/zenodo.18862915>

ARTICLE INFO

Qabul qilindi: 24-fevral 2026 yil
Ma'qullandi: 26-fevral 2026 yil
Nashr qilindi: 28-fevral 2026 yil

KEYWORDS

COPD, comorbidity,
cardiovascular diseases,
hypoxia, pulmonary
hypertension..

ABSTRACT

Chronic obstructive pulmonary disease (COPD) is one of the global health problems and is considered one of the leading causes of death and disability. Patients with COPD frequently experience cardiovascular diseases, which significantly worsen the prognosis of the disease. This article analyzes the pathogenetic relationship between COPD and cardiovascular diseases, the clinical course characteristics, mechanisms of complication development, and their impact on treatment effectiveness based on scientific sources. The role of environmental and demographic factors in the Fergana region is also highlighted.

Relevance of the research. Chronic obstructive pulmonary disease is a progressive disease characterized by chronic inflammation of the airways and airflow limitation. The main etiological factors are tobacco smoking, industrial aerosols, dust, and biofuel fumes.

The following cardiovascular diseases are common in patients with COPD:

- Ischemic heart disease;
- Arterial hypertension;
- Heart failure;
- Pulmonary heart disease.

Studies show that the main cause of death in patients with COPD is often not respiratory failure, but rather cardiovascular complications, which is important to assess.

Research objective. Comorbid cardiovascular diseases in SCD:

1. Impact on the course of the disease;
2. Mechanisms of development of complications;
3. Impact on the effectiveness of treatment;
4. Epidemiological characteristics in the conditions of the Fergana region.

Research task. The pathogenetic relationship between SCD and cardiovascular diseases, clinical features, mechanisms of development of complications, and their impact on the effectiveness of treatment were analyzed based on scientific sources. The role of ecological and demographic factors in the conditions of the Fergana region was highlighted, which is the main goal of the study.

Materials and methods. The study was conducted on the basis of a retrospective analysis. Medical records of patients over 50 years of age with a diagnosis of COPD were reviewed. The following examinations were evaluated:

- Spirometry;
- ECG;
- ECHO-KG;
- Blood biochemical analysis;
- Blood pressure monitoring.

Proven methods:

1. Correlation methods were used in statistical analysis;
2. Operational analysis using Word and Excel programs;
3. Statistical analysis (SPSS program).

Results. Regional risk factors:

- High tobacco smoking rates;
- Industrial emissions;
- Biofuel smoke in rural areas;
- High proportion of population over 50 years old.

As a result, there is a high rate of comorbidity of COPD and cardiovascular diseases.

Discussion. The following mechanisms have been identified between COPD and cardiovascular disease:

1.1 Chronic hypoxia

As a result of bronchial obstruction, arterial hypoxemia occurs. This causes vasoconstriction in the small circulation. As a result, pulmonary hypertension develops and right ventricular afterload increases.

1.2. Systemic inflammation. In COPD, the levels of CRP, IL-6 and TNF- α increase. This accelerates the process of atherosclerosis. Endothelial dysfunction increases the risk of thrombosis.

1.3. Oxidative stress. Increased levels of free radicals damage myocardial cells.

2. Impact on clinical course. In patients with comorbidities:

- Dyspnea is more severe
- Physical activity is severely limited
- More frequent exacerbations
- More frequent hospitalizations

During exacerbations of COPD, hypoxemia exacerbates myocardial ischemia. Arrhythmias and heart failure develop rapidly.

3. Development of complications. The following complications are more common in comorbid patients:

- Pulmonary hypertension
- Right ventricular hypertrophy
- Right ventricular failure
- Thromboembolic complications
- Increased risk of myocardial infarction

Each respiratory effort places additional stress on the heart muscle.

4. Effect on treatment efficacy. β 2-agonists used in COPD can cause tachycardia. Some β -blockers increase the risk of bronchospasm. Therefore, cardioselective β 1-blockers are recommended.

Long-term oxygen therapy:

- Reduces pulmonary hypertension
- Reduces right ventricular afterload
- Increases life expectancy

A complex approach (pulmonologist + cardiologist) increases the effectiveness of treatment.

Fergana region is an industrialized region with high traffic density. Air pollution increases the risk of developing COPD. As a result, there is a high rate of comorbidity of COPD and cardiovascular diseases.

Conclusion. COPD and cardiovascular diseases are pathogenetically interconnected diseases. Comorbidity:

- Increases the severity of the disease;
- Accelerates the development of complications;
- Reduces the effectiveness of treatment;
- Increases the risk of death.

In the conditions of the Fergana region, environmental and demographic factors make this problem even more urgent. An integrated multidisciplinary approach improves the prognosis.

Practical recommendation:

- ✓ Smoking cessation;
 - ✓ Reducing air pollution;
 - ✓ Early screening (spirometry, ECG);
 - ✓ Blood pressure control;
- Rehabilitation programs.

References:

1. American College of Cardiology; American Heart Association. Guideline for the Management of Heart Failure. – Circulation. – 2022. – Vol. 145. – P. e895–e1032.
2. American Thoracic Society. Standards for the Diagnosis and Management of Patients with COPD. – Am J Respir Crit Care Med. – 2004. – Vol. 170. – P. 530–555.
3. American College of Chest Physicians. Antithrombotic Therapy Guidelines // Chest. – 2016. – Vol. 149. – P. 315–352.
4. Barnes P.J. Chronic obstructive pulmonary disease: effects beyond the lungs // PLoS Med. – 2010. – Vol. 7(3). – e1000220.
5. Celli B.R., Wedzicha J.A. Update on clinical aspects of chronic obstructive pulmonary disease // N Engl J Med. – 2019. – Vol. 381. – P. 1257–1266
6. European Society of Cardiology. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. – European Heart Journal, 2023. – Vol. 44. – P. 3599–3726.
7. European Society of Cardiology. ESC Guidelines on cardiovascular disease prevention in clinical practice. – Eur Heart J. – 2021. – Vol. 42. – P. 3227–3337.
8. European Respiratory Society. ERS Statement on COPD and Cardiovascular Comorbidity. – Eur Respir J. – 2019. – Vol. 54. – 1900853.

9. European Society of Hypertension. Guidelines for the management of arterial hypertension // J Hypertens. – 2018. – Vol. 36. – P. 1953–2041.
10. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of COPD – 2024 Report. – 2024. – 192 p.
11. Global Burden of Disease Study 2021 Collaborators. Global burden of chronic respiratory and cardiovascular diseases // Lancet. – 2022. – Vol. 400. – P. 1203–1249.
12. Rabe K.F., Hurd S., Anzueto A. et al. Global strategy for the diagnosis, management, and prevention of COPD // Am J Respir Crit Care Med. – 2007. – Vol. 176. – P. 532–555.
13. Sin D.D., Man S.F. Systemic inflammation and mortality in chronic obstructive pulmonary disease // Am J Respir Crit Care Med. – 2003. – Vol. 168. – P. 760–765.
14. United Nations Environment Programme. Air Quality and Public Health Report. – Nairobi, 2022. – 134 p.
15. O'zbekiston Respublikasi Sog'liqni saqlash vazirligi. Surunkali obstruktiv o'pka kasalligini tashxislash va davolash bo'yicha milliy klinik protokol. – Toshkent, 2022. – 64 b.
16. O'zbekiston Respublikasi Sog'liqni saqlash vazirligi. Yurak-qon tomir kasalliklarini profilaktika va davolash bo'yicha klinik tavsiyalar. – Toshkent, 2021. – 72 b.
17. World Bank. Air Pollution and Health Impact in Central Asia. – Washington DC, 2022. – 115 p.
18. World Health Organization. Global Health Estimates 2023: Leading causes of death and disability. – Geneva: WHO, 2023. – 98 p.

INNOVATIVE
ACADEMY