

**CHRONIC OBSTRUCTIVE PULMONARY DISEASE
AS A PREDICTOR OF EARLY RIGHT VENTRICULAR
FAILURE IN MILITARY PERSONNEL:
A LITERATURE REVIEW**

R. L. Liubevych, S. V. Zaikov

Abstract

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of morbidity and mortality; among military personnel, it is associated with high rates of smoking, inhalation exposures (dust, smoke, combat pollutants), extreme physical exertion, and the chronic stress of combat duty. This creates a unique setting for the early development of pulmonary hypertension and right ventricular failure, which often remain subclinical and undiagnosed but critically affect combat effectiveness and the risk of sudden decompensation during mission execution.

Data from 2010–2025 on the pathophysiological mechanisms underlying the progression of COPD complications to right ventricular heart failure have been summarized: chronic hypoxia, pulmonary vasoconstriction, pulmonary vascular remodeling, right ventricular hypertrophy and dilation, systemic inflammation, and neurohumoral activation. It has been shown that a decrease in FEV₁ and small airway dysfunction are associated with increased pulmonary artery pressure and worsening indicators of right ventricular function (TAPSE, TAPSE/sPAP, RV GLS), while an increase in NT-proBNP reflects early right ventricular overload. The role of psychoemotional factors (stress, anxiety, depression), which worsen pulmonary-cardiac hemodynamics through chronic activation of the sympathetic-adrenal and HPA systems, and specific service conditions (inhalation hazards, physical exertion, limited access to diagnostics), which accelerate the development of right ventricular failure and complicate its detection. Despite a significant number of studies in civilian populations and among veterans, there are virtually no studies that comprehensively assess COPD, right ventricular function, and the psychoemotional state specifically in active-duty military personnel, indicating a significant gap in the evidence base.

Keywords: chronic obstructive pulmonary disease; right ventricular failure; pulmonary hypertension; FEV₁, TAPSE/sPAP; NT-proBNP; military personnel; veterans; inhalation exposures, pollutants, combat stress; anxiety; depression.

Ukr. Pulmonol. J. 2026;34(2):54–62.

Rostyslav L. Liubevych
Shupyk National Healthcare University of Ukraine
Kyiv, Ukraine
rostyslav.liubevych@gmail.com
+380973592979
<https://orcid.org/0000-0003-4049-4482>