

## DETERMINATION OF CORRELATION RELATIONSHIP BETWEEN HEMODYNAMIC INDICATORS AND BLOOD GAS COMPOSITION IN PATIENTS WITH COPD

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### **Abstract:**

Today, Chronic Obstructive Pulmonary Disease (COPD) is one of the most common therapeutic diseases. As COPD progresses, the increase in PH (pulmonary hypertension) coincides with the occurrence of cardiovascular diseases and increases the level of life risk [2,3,6]. However, very few studies have investigated the mechanisms of the relationship between COPD and cardiovascular diseases. In the conducted studies, the changes in the activity and structure of the heart during the course of the disease were evaluated only by the pathological process in the right part of the heart [1,4,5]. According to the conclusion of the scientific research carried out in recent years, the pathophysiological characteristics of COPD in patients with cardiovascular diseases and those without risk factors have been substantiated as having a special importance in the remodeling of the cardiovascular system.

**The purpose of the study.** Determination of the correlation between hemodynamic indicators and blood gas composition in patients with COPD.

**Research materials and methods.** 120 patients with COPD mixed type pulmonary hypertension who were being treated in hospital conditions were taken as a research source in Bukhara regional multidisciplinary hospital. They were compared by conducting an objective examination, generally accepted laboratory-instrumental tests, including blood gas content. Blood gas composition was determined as follows: among patients with pulse oximetry values < 94-95%, blood gas composition was determined on the AVL-995 (Austria) gas analyzer. Blood gas determinations included oxygen tension (PaO<sub>2</sub>), carbon dioxide tension (PaSO<sub>2</sub>), oxygen saturation (SaO<sub>2</sub>), and alveolar-capillary gradient based on arterial capillary oxygen (AaDO<sub>2</sub>). Blood gases index (PaO<sub>2</sub>, PaCO<sub>2</sub> and AaDO<sub>2</sub>) were evaluated in absolute units (mm Hg), and SaO<sub>2</sub> in percentages. Blood for analysis was taken from the auricle treated with "Finalgon" ointment.

**Research results.** Studying the relationship between the gas content of blood and systolic pressure in pulmonary artery at different severity levels of the disease when COPD is accompanied by pulmonary hypertension is of some scientific and practical importance. When studied from this point of view, there is a positive correlation ( $r = 0.3$ ;  $P < 0.03$ ) between systolic pressure in pulmonary artery and the partial pressure of carbon dioxide in the blood

(pCO<sub>2</sub>) in patients with II severity of the disease in our observation, a negative reliable correlation with the partial pressure of oxygen (pO<sub>2</sub>) ( $r = -0.3$ ;  $P < 0.02$ ) was found. These indicators are respectively  $r = 0.54$  in the III degree of severity of the disease;  $P < 0.001$  and  $r = -0.6$ ;  $P < 0.001$ .

In addition, there was a negative correlation ( $r = -0.34$ ;  $P < 0.03$ ) between the level of blood oxygen saturation (sO<sub>2</sub>) and systolic pressure in pulmonary artery in this group of patients. In patients with COPD with pulmonary hypertension and IV degree of severity, there was a positive correlation ( $r = 0.5$ ;  $P < 0.001$ ) between systolic pressure in pulmonary artery and the partial pressure of carbon dioxide in the blood ( $p < 0.001$ ), a negative reliable correlation with the partial pressure of oxygen (pO<sub>2</sub>) ( $r = -0.36$ ;  $P < 0.02$ ). In this group, a negative correlation ( $r = -0.36$ ;  $P < 0.02$ ) was noted between the level of blood oxygen saturation (sO<sub>2</sub>) and systolic pressure in pulmonary artery. In addition to the above, in patients with COPD pulmonary hypertension, when the disease progressed to the next level of severity, there were also correlations of various degrees with systolic pressure in pulmonary artery and a number of other indicators that we studied. In particular, SAD ( $r = 0.32$ ;  $P < 0.04$ ), DAD ( $r = 0.38$ ;  $P < 0.01$ ), mean blood pressure ( $r = 0.36$ ;  $P < 0.02$ ), end-diastolic volume ( $r = 0.39$ ;  $P < 0.01$ ), end-systolic volume ( $r = 0.36$ ;  $P < 0.02$ ), end-diastolic volume ( $r = 0.45$ ;  $P < 0.03$ ) and later reliable positive correlations with systolic dimensions ( $r = 0.3$ ;  $P < 0.03$ ). These indicators confirm that pulmonary hypertension increases with COPD III severity and has a negative impact on numerous parameters of the heart, including not only the right but also the left side of the heart. This was also confirmed by the analysis of patients with COPD IV severity level of pulmonary hypertension. In it, end-diastolic size ( $r = 0.47$ ;  $P < 0.002$ ), end-systolic size ( $r = 0.59$ ;  $P < 0.001$ ), end-diastolic volume ( $r = 0.55$ ;  $P < 0.001$ ) and end-systolic size ( $r = 0.39$ ;  $P < 0.01$ ) reliable positive correlations were also found.

In the identified correlations, it was confirmed that there is an organic connection between blood gas composition and pulmonary hypertension observed in COPD. In this case, an increase in the partial pressure of carbon dioxide in the blood leads to an increase in pulmonary hypertension, and an increase in the partial pressure of oxygen leads to its decrease.

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