
ASPECTS OF VERIFICATION OF RADIATION DIAGNOSTICS OF CHRONIC OBSTRUCTIVE LUNG DISEASE

DOI: [10.31618/ESU.2413-9335.2020.3.72.630](https://doi.org/10.31618/ESU.2413-9335.2020.3.72.630)¹*Turdumatov Zh.A.*, ²*Mardieva G.M.*¹*Turdumatov Jamshed Anvarovich - assistant;*²*Mardieva Gulshod Mamatmuradovna - Associate Professor.**Department of General Surgery, Radiation Diagnostics and Therapy,
Samarkand State Medical Institute***ANNOTATION**

During the examination of 60 patients with long-term (chronic) cough and shortness of breath using standard and digital radiography, as well as computed tomography, 21 patients were verified to have chronic obstructive pulmonary disease. Differentiated chronic obstructive pulmonary disease based on the clinical and radiological symptom complex, indicating damage to the small bronchi. A symptom of an expiratory "air trap" in combination with the expansion and deformation of the bronchi of various calibers, up to bronchiolectasis, was a diagnostic symptom for chronic obstructive pulmonary disease during computed tomography.

Key words: chronic obstructive pulmonary disease, computed tomography, radiography.

Relevance. Disturbing fact is the continuing upward trend in mortality from chronic obstructive pulmonary disease (COPD). In recent years, it has been noted that COPD is accompanied by psychological and psychiatric problems. It is estimated that the current costs in the health and social security system in compensating for the damage caused by COPD to the health of the population are 30–40 times higher than the costs of preventing them. According to the documents of the European Respiratory Society, only 25% of cases are diagnosed in a timely manner [4,7].

The development of chronic obstructive pulmonary disease in many patients can be prevented, and its treatment, can achieve significant success [3]. The results of an objective examination of patients with COPD depend on the severity of bronchial obstruction and emphysema. However, the results of an objective examination do not fully reflect the severity of the disease, and the absence of clinical symptoms does not exclude the presence of chronic obstructive pulmonary disease in the patient [2].

In modern evidence-based medicine, a whole arsenal of radiation diagnostic methods based on various physical principles is used to diagnose chronic obstructive pulmonary disease. According to some authors [1,5,6], imaging methods are of limited value in the diagnosis of chronic obstructive pulmonary disease, since the morphological signs of COPD are often non-specific and variable, which determines the absence of typical radiation signs. The main goal of

radiation research is usually to exclude other diseases and pathological conditions that may have similar clinical manifestations or may be combined with chronic obstructive pulmonary disease.

The purpose of the study was to assess the diagnostic capabilities of computed tomography in the diagnosis of early signs of COPD with various degrees of obstructive patency [1,8].

Material and methods. From 2018 to 2019 60 patients (40 men and 20 women) who were examined due to suspected COPD were examined. The age of patients ranged from 20 to 70 years. The main clinical symptoms of the disease in most of the examined patients were chronic cough with sputum production and shortness of breath during physical exertion.

Along with a clinical examination, all patients underwent a chest x-ray in a direct and lateral projection, computed tomography.

The results of the study. Of the 60 patients examined, COPD was detected in 21 (35%). The distribution of the remaining 39 patients by nosological forms of lung diseases was as follows: chronic bronchitis was found in 22 (56.4%) patients, pulmonary emphysema in 17 (43.6%). All patients with a confirmed diagnosis of COPD (21 people) were divided into 4 main groups depending on the severity of the disease: Stage 1 - mild COPD; 2nd stage - COPD of moderate severity; Stage 3 - severe course and stage 4 - extremely severe COPD and a risk group for developing COPD (Fig. 1).

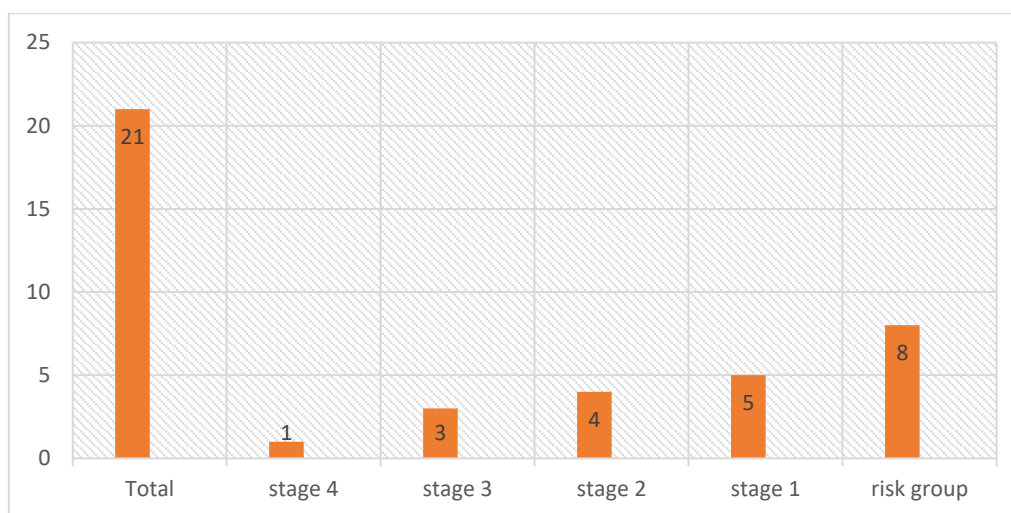


Fig 1. The distribution of the examined patients depending on the stage of the disease according to the severity of COPD

Patients at risk of increasing the disease (8 people) were bothered by a prolonged cough and moderate sputum production. Five patients who made up the group with a 1st degree of severity (mild course) complained of shortness of breath with significant physical exertion, cough, a moderate amount of sputum. With moderate severity of COPD in 4 patients (grade 2), shortness of breath during physical exertion, cough, and the release of a significant amount of sputum were noted. For the 3rd degree of severity (3 patients), in severe cases, shortness of breath at rest, coughing and the release of a large amount of sputum were observed. And, finally, in 1 patient, who made up the group with a 4th degree of severity, an extremely severe course of the disease was observed, severe shortness of breath at rest, cyanosis, acrocyanosis, respiratory and right ventricular failure.

All radiographs of the lungs had performed at the height of the inspiration, with the breath held. The most characteristic radiological signs of obstruction in the lungs were: increased airiness of the lung tissue in the expiratory phase due to the excess air content in the respiratory parts of the lungs (14%); flattening of the domes of the diaphragm and smoothness of the sinuses of the pleura (19%); vertical position of the axis of the heart on a panoramic x-ray of the chest organs in direct projection (heart shadow of "small" sizes or the so-called "drip" heart) (19%); "Saber" shape of the trachea is the predominance of the sagittal (anteroposterior) size of the trachea, determined by the lateral radiograph over the transverse dimension, which is changed by the radiograph in direct projection (12.6%).

In addition, a review of chest radiography in patients with COPD revealed the following: reinforcement and deformation of the pulmonary pattern in the basal and suprarenic parts of the lungs (19%); thickening of the walls of the lobar and segmental bronchi (23%); fuzzy contours of blood vessels, bronchi, as well as "blurring" of the structure of the roots of the lungs (33%), as well as signs of deformation of the pulmonary pattern in the basal parts of the lungs with thickening of the walls of the bronchi of various calibers.

Similar clinical symptoms in patients with various pathological changes in the lungs created significant difficulties in the differential diagnosis of COPD with chronic bronchitis and emphysema, as well as in assessing the severity of COPD. This circumstance served as the basis for studying the additional capabilities of computed tomography (CT) in the diagnosis of COPD in order to increase the effectiveness of radiation research methods.

Computed tomography in patients with COPD allows you to assess the structure of the lung tissue, the condition of the small bronchi. With the help of CT, the localization of the most air zones in the lungs is clarified. With emphysema, this indicator rises to -900 HU, and sometimes even to -1000 HU. Furthermore, a comparison of densitometric indices of adjacent sections of the lung on inspiration and expiration helps to determine not only over-inflated, but also poorly ventilated sections.

CT of the lungs using functional breathing tests (inspiratory phase and expiratory phase) made it possible to detect early signs of COPD already at the preclinical (people at risk) stage of the disease, even under normal conditions of external respiration function. When using CT in the expiratory phase, all patients from the risk group revealed the presence of air "traps" in the lungs, a symptom of a "tree with kidneys", indicating pathological changes at the level of small bronchi.

When CT was performed in 2 patients with 1st severity of COPD, expansion and deformation of the segmental and subsegmental bronchi were noted, and in 1 patient - bronchial damage, mainly in the peripheral parts of the lungs. At the same time, in 2 (9.5%) patients, when examining in the inspiratory phase, the lung tissue was not changed. In 3 (14.3%) patients there were signs of a "mosaic" lung in the inspiratory phase, and in all 5 patients there were signs of an "air trap" in the exhalation phase. As can be seen, according to the results obtained, in almost half of the examined patients with COPD (43.8%), radiography did not reveal changes in the lungs, while according to CT data, these changes were established.

When performing CT, in almost all patients with COPD with a 2nd degree of disease severity, signs of damage to the bronchi of various calibers were noted. At the same time, thickening and deformation of the walls of segmental and subsegmental bronchi were established in 3 (14.3%) patients, of which 1 patient had a symptom of "tram rail". The defeat of the distal parts of the bronchi was detected in 2 patients, and the proximal parts of the bronchi in 3 (15%) patients. Strengthening of the pulmonary pattern in the lower lobes of the lungs was observed in 3 (15%) patients. In a CT study in the inspiratory phase, signs of a "mosaic" lung were noted in 3 patients out of 4 examined and in 1 patient no changes in the lungs were detected. In all 4 patients with COPD with the 2nd stage of the disease, CT signs of an "air trap" were detected during the study in the expiratory phase in the lungs.

With a diagnosis of stage 3 COPD, 3 patients were examined, on the radiographs of which changes in the pulmonary pattern in the form of pneumosclerosis and thickening of the walls of the bronchi were detected, the presence of bronchiectasis: sacular and cylindrical bronchiectases were differentiated. CT scan revealed the following signs of bronchial damage: thickening of

the walls, symptom of "tram rails", changes at the level of small bronchioles (symptom of "tree with kidneys"). Moreover, in all 3 patients, a symptom of a pronounced expiratory "air trap" was observed in the expiratory phase.

At the 4th severity of COPD, the leading clinical sign of the disease was severe shortness of breath at rest, intensifying at the slightest exertion. In addition, drowsiness and some lethargy were noted in the patient's condition. On examination, cyanosis of the skin was detected. An X-ray examination revealed multiple "bag-shaped" bronchiectasis, thickening and strengthening of the pulmonary pattern in the lower parts of the lungs, an increase in the size of the heart's shadow. With CT, in the inspiratory phase and the exhalation phase, the lungs remained as if swollen and were in a state of "fixed inspiration". When performing an expiratory CT scan, the identification of bronchiectasis and a symptom of valvular distention, the "air trap", was of the greatest diagnostic value.

The frequency of detection of diagnostic CT signs of damage to the lungs and bronchi in COPD, depending on the severity of the disease, is presented in table 1.

Table 1

The frequency of detection of diagnostic CT signs of damage to the lungs and bronchi in COPD, depending on the severity

CT signs of COPD	Sign detection frequency							
	1 g. (n=5)	%	2 gr. (n=4)	%	3 gr. (n=3)	%	4 gr. (n=1)	%
The presence of single sections of emphysema of various types	2	40	2	20	2	66	1	100
Expiratory air "trap"	5	100	4	100	3	100	1	100
The presence of zones of volume of lung tissue with a low density with a range from -1000 to -950 HU	1	20	1	25	2	66	1	100
"Mosaic" lung tissue	3	60	3	75	3	100	1	100
Expansion and deformation of segmental and subsegmental bronchi	2	40	3	75	3	100	1	100
Thickening of the walls of the bronchi	2	40	3	75	2	66	1	100
Lesion of bronchioles (symptom of a "tree in the kidneys")	1	20	3	75	3	100	1	100
The presence of bronchiectasis (symptom of "ring")	-	-	1	25	2	66	1	100

As you can see, the variety of different broncho-pulmonary diseases with similar clinical symptoms makes it extremely difficult to conduct differential diagnosis of COPD. In this regard, there is a need to highlight objective diagnostic criteria that can be obtained using x-ray studies.

Thus, radiation examination of a patient with COPD begins with radiography of the organs of the chest cavity. In the presence of clinical indications or doubtful results of radiography, a CT scan of the lungs can be performed. Introduction to clinical practice of computed tomography, including expiratory, significantly expanded the possibilities of radiation diagnostics and made it possible to identify a number of characteristic changes in the lungs, often invisible on conventional radiographs.

Conclusion. COPD is formed as a result of damage to the small bronchi, which determines the characteristic clinical and radiological symptom complex, and makes it possible to differentiate this disease with emphysema and chronic bronchitis.

Assessment of the degree of impaired ventilation in the lungs of patients with COPD should be carried out under CT conditions performed in the inspiratory phase and the expiratory phase. Diagnostic significant for COPD during computed tomography is a symptom of an expiratory "air trap", in combination with the expansion and deformation of the bronchi of various calibers, up to bronchio-ectopic bronchiectasis. CT is an informative research method that allows you to timely detect the development of pathological changes

in COPD in the lung tissue and bronchi, especially of small caliber.

CT can serve as a non-invasive method for detecting morphological changes in the lungs in the early stages of COPD, which makes it possible to prescribe adequate treatment in a timely manner and judge the effectiveness of the therapy. Thus, the most informative method of radiation diagnosis of chronic obstructive pulmonary disease is inspiratory-expiratory CT.

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PROGNOSIS OF HEMODYNAMIC EFFICACY IN PATIENTS WITH ARTERIAL HYPERTENSION WITH VARIOUS HELIOTROPIC REACTIONS

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Shadmanova Nargis K.

Bukhara State Medical Institute

ПРОГНОСТИКА ГЕМОДИНАМИЧЕСКОЙ ЭФФЕКТИВНОСТИ У БОЛЬНЫХ АРТЕРИАЛЬНОЙ ГИПЕРТОНИЧЕСКОЙ БОЛЕЗНЬЮ ПРИ РАЗЛИЧНОЙ ГЕЛИОТРОПНОЙ РЕАКЦИИ

Наргис Курбановна Шадманова

Бухарский государственный медицинский институт

ABSTRACT

The article is dedicated to the study of the position of hemodynamic figure in patients with II-stage of arterial hypotension disease with the help of moxonidin and bisoprolol treatment. 49 patients aged from 32 to 60 years old with arterial hypotension disease were examined. All the patients were provided with echocardiography. It is proved that moxonidin has more positive impaction in hemodynamic figure rather than bisoprolol.

АННОТАЦИЯ

Статья посвящена изучению статуса гемодинамических данных у пациентов с артериальной гипотензией II стадии с помощью лечения моксонидином и бисопрололом. Обследовано 49 пациентов в возрасте от 32 до 60 лет с артериальной гипотензией. Всем пациентам была предоставлена эхокардиография. Доказано, что моксонидин имеет более положительное влияние на гемодинамику, чем бисопролол.

Keywords: hemodynamic, prognosis, reaction, heliotrope, aged, impaction, hypotension, disease, differentiated approach.

Ключевые слова: гемодинамика, прогноз, реакция, гелиотропный, старение, импактация, гипотензия, заболевание, дифференцированный подход.

The protection of human health is a priority area of state social policy in Uzbekistan. Gaining more and more widespread, arterial hypertension (AH) today occupies a leading position in the structure of the general morbidity and mortality of the population. According to the latest data from the Cardiology Center of the Ministry of Health of the Republic of Uzbekistan,

this pathology occurs in 32% of the adult population of our country (Kurbanov R.Sh., 2011).

A meta-analysis of numerous studies on the study of hypertension showed that an increase in blood pressure for every 6 mmHg increases the risk of stroke by 40%, myocardial infarction (MI) by 20% (Bragin A.U., 2010). According to the latest data, 972 million