

**SCIENTIFIC
COLLECTION
INTERCONF+**



No 71
August, 2021

THE ISSUE CONTAINS:

Proceedings of the 3rd
International Scientific
and Practical Conference

**CURRENT ISSUES AND PROSPECTS FOR THE
DEVELOPMENT OF SCIENTIFIC RESEARCH**








ORLÉANS, FRANCE


19-20.08.2021

CURRENT ISSUES AND PROSPECTS FOR THE DEVELOPMENT OF SCIENTIFIC RESEARCH

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DOI 10.51582/interconf.19-20.08.2021.025

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CLINICAL ASPECTS OF COPD IN PATIENTS WITH GERD

***Abstract.** The presence of combined pathology is an aggravating factor for the course of COPD. The aim of the research: to assess the impact of GERD on the course of chronic obstructive pulmonary disease. As a result of a retrospective study of 102 patients who were hospitalized for exacerbations of COPD, it was found that the presence of GERD is associated with more frequent exacerbations of the disease, severe bronchial obstruction, which in turn leads to an increase in hospitalizations in this category of patients.*

***Keywords:** chronic obstructive pulmonary disease, gastroesophageal reflux disease, exacerbation, hospitalization.*

Introduction. The presence of concomitant gastroesophageal reflux disease (GERD) in patients with chronic obstructive pulmonary disease (COPD) is quite common in clinical practice today and is usually one of the reasons for the increase in respiratory symptoms [1,2,3]. According to researchers, this pathological relationship, is due, on the one hand, that bronchial obstruction with GERD may be exacerbated by microaspiration of gastric contents into the trachea and bronchi, as well as during stimulation by n.vagus of the receptors of the distal part esophagus

[4,5]; on the other hand, the pathology of the pulmonary system, provoking a cough, leads to a change in intrathoracic pressure and, consequently, to a decrease in the tone of the lower esophageal sphincter(LES), which is one of the pathogenetic factors in the development of GERD [6,7].

Moreover, if the occurrence of concomitant GERD is not diagnosed in time and is ignored its role in the impact on respiratory pathology and all of this is regarded as progression of COPD, thus increasing the treatment of the underlying disease by increasing doses of drugs, inhaled glucocorticosteroids, which in turn reduce in the tone of LES, creating additional favorable conditions for the formation of concomitant GERD [8] However, many questions related to the occurrence of concomitant GERD in patients with COPD, and with its timely diagnosis, do not have an unambiguous answers and often remain out of the attention of doctors and require further research.

The aim of the research to assess the impact of GERD on the course of chronic obstructive pulmonary disease.

Materials and methods of the research: a retrospective analysis of 102 patients who were treated in the pulmonology department CNE "Transcarpathian regional clinical hospital named after Andriy Novak.

The studies were conducted with the consent of patients, and the method of conducting them in accordance with the Helsinki Declaration of 1975 and its revision in 1983. The study was approved by the local ethics commission (protocol № 2/4 from 27.09.2019), and its participants were acquainted and signed a letter of approval in a hospital, the structure of which corresponded to the officially accepted.

Inclusion criteria: patients with exacerbation of COPD stage 2 (GOLD II), age > 40 years, forced expiratory volume per 1 second (FEV1) was <60% of normal and the ratio of forced expiratory volume per 1 second to forced vital capacity lungs (FEV1 / FVC) <70%, increase in FEV1 after inhalation of short-acting β 2-agonist less than 12% compared to baseline.

The diagnosis of COPD was confirmed in accordance with the order of the Ministry of Health of Ukraine № 555 from 27.06.2013 "On approval of clinical protocols for medical care in the specialty" Pulmonology "and the provisions set out

in the document GOLD [2017] [9,10]. Gastroesophageal reflux disease (GERD) was confirmed in the presence of relevant complaints and the data of upper endoscopy and pH-monitoring in the patient (order of the Ministry of Health of Ukraine № 943 from 31.10.2013) [11].

The diagnosis of concomitant pathology was verified at the previous stages of research and treatment. To clarify the diagnosis, some patients underwent additional research methods.

2 groups of patients were formed: 1 group (n = 60) - patients with COPD in combination with GERD, 2 group (n = 42) - patients with COPD without signs of GERD, who were treated in the pulmonology department for exacerbation of the disease. The average age of the patients was 55 ± 1.64 years. It should be noted, regarding the gender characteristics of the groups, that among the examined patients by gender, men predominated - 78.4% (80 out of 102), respectively, women were 21.6% (22 out of 102). The average age of men was 53 ± 1.6 years, women - 56 ± 1.3 years.

Data analysis was performed using software products included in the Microsoft Office Professional package, 2007. The continuous variables were compared using Student's t-test or Mann-Whitney test (depending on the type of distribution). The discrete variables were compared using the χ^2 test and Fisher's exact test (with a small number of observations). The relationship between the presence of GERD and the risk of exacerbations of COPD / hospitalizations was assessed by correlation analysis.

Results and discussion. After the study, the following results were obtained.

Among smokers, there was also a predominance in males - 73.5% (75 out of 102, respectively in females - 6.9% (7 out of 102). The average value of heaviness smoking index (HSI) in men 22 ± 5.6 , in women - 22 ± 4.4 pack / years (table 1)

The normal value of the body mass index (BMI) (kg) / height (m)² - (18.5-24.9) was found in 30.3% (31 of 102), BMI (25.0-29.9) - in 45.1% (46 of 102), obesity with a BMI over 30 had 24.5% (25 of 102) found statistically significant differences ($p > 0.05$).

There are no statistically significant differences were found in patients with a

combination of COPD and GERD ($p > 0.005$) during comparing groups by sex, age, smoking status,

Patients with concomitant GERD compared with patients without GERD had a higher frequency of exacerbations of COPD (2.1 ± 0.3 and 1.8 ± 0.6 , respectively, $p < 0.005$). Also, patients with COPD and concomitant GERD had a higher frequency of hospitalizations (2.4 ± 0.3 and 1.8 ± 0.5 respectively, $p < 0.005$) (table 1). With the correlation analysis were revealed a significant relationship between the frequency of GERD and exacerbations of COPD ($r = 0.42$, $p < 0.005$), the severity of bronchial obstruction ($r = 0.49$, $p < 0.005$), the frequency of hospitalizations for COPD ($r = 0.41$, $p < 0.005$). It was found that the severity of bronchial obstruction was higher in patients with concomitant GERD. In addition, a correlation was found between the frequency of GERD symptoms and the severity of bronchial obstruction at $p < 0.001$.

Table 1

The clinical characteristics of the patients

Clinical sign	Group 1 (n=60) COPD + GERD		Group 2 (n=42) COPD	
	Male	Female	Male	Female
Gender: male / female (abs./%)	48/80.0	12/20.0	32/76.2	10/27.8
Age (years)	54±1.2	57±0.9	53±2.1	56±1.6
Smokers (ab /%)	45/75.0	3/5.0	30/71.4	4/9.5
HSI (pack / years)	22±4.7	21±5.3	23±6.6	24±3.4
BMI 18.5-24.9 (abs /%)	10/16.7	1/1.7	16/38.1	4/9.5
BMI 25,0-29,9 (abs /%)	26/43.3	6/10.0	11/26.2	3/7.1
BMI over 30 (abs /%)	12/20.0	5/8.3	5/11.9	3/7.1
The frequency of the exacerbations for year	2.1±0.3*	1.8±0.6*	1.7±0.4	1.8±0.3
The frequency of the hospitalizations for year	2.4±0.3*	1.8±0.5*	1.7±0.5	1.5±0.5
FEV1%	73.3±1.9*	74.4±1.7*	75.4±1.7	74.3±1.9
FVC%	63.2±1.8	66.1±1.4	67.4±0.4	71.2±1.8
FEV1 / FVC%	63.2±0.9*	65.2±0.7*	64.2±1.1	65.4±1.3

Significance of the difference: the difference between the indicators in patients 1 and 2 groups is significant: * - $p < 0.005$

The pathogenetic explanation of the relationship between GERD and COPD is not fully investigated. There are assumptions about the following mechanisms are provided: microaspiration of gastric contents; nervus vagus-mediated esophagobronchial reflux in response to esophageal acidification during reflux; high intra-abdominal pressure, due to hyperinflation and increased tension of the respiratory muscles, which changes the relationship between the diaphragm and the lower esophageal sphincter, reducing the tone of the latter.

Conclusion. The presence of GERD in patients with COPD is associated with more frequent exacerbations, more severe bronchial obstruction, which in turn leads to an increase in the frequency of hospitalizations. GERD is one of the factors contributing to the exacerbation of COPD.

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