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COMPARATIVE ASSESSMENT OF THE QUALITY OF LIFE IN PATIENTS WITH BRONCHIAL ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE BEFORE AND AFTER COVID-19

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СРАВНИТЕЛЬНАЯ ОЦЕНКА КАЧЕСТВА ЖИЗНИ У БОЛЬНЫХ БРОНХИАЛЬНОЙ АСТМОЙ И ХРОНИЧЕСКОЙ ОБСТРУКТИВНОЙ БОЛЕЗНЬЮ ЛЕГКИХ В ПЕРИОД ДО И ПОСЛЕ ПЕРЕНЕСЕННОЙ ИНФЕКЦИИ COVID-19

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Objective. To compare the quality of life of patients with bronchial asthma and chronic obstructive pulmonary disease (COPD) before and after COVID-19.

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Materials and methods. 73 patients diagnosed with bronchial asthma and 78 patients with COPD who were treated at Sechenov University Clinical Hospital №4, participated in the retrospective dynamic comparative study based on the principle «from cause to effect». Assessment of the quality of the patients` life was carried out before and after COVID-19 using a visual analogue scale from 0 to 100 points and the universal EuroQol-5D questionnaire. Mobility, self-care abilities, habitual activity, severity of pain/discomfort, the presence of anxiety/depression in the post-COVID period were assessed.
Results. In patients with COPD before COVID-19, the average total score on the visual–analogue scale was 89,5 [83,8; 95], and after COVID-19 it was 70 [64,5; 80] points. In the post-covid period, 91 % of people with COPD noted some mobility limitations, 33.3 % experienced difficulties with self-care, 65.4 % of patients could not engage in habitual activities, 60.3 % suffered pronounced pain or discomfort, and 29.5 % of patients had severe anxiety or depression. In patients with asthma before COVID-19, the average total score was 90 [88,4; 91] points, and after COVID-19 it was 75 [70,2; 80,2]. In the post-ovarian period, mobility limitations were noted by 71.2 % of patients, and 64.4 % had difficulties with taking care of themselves, 54.8 % could not engage in habitual activities. At the same time, 78.1 % of patients experienced pain or discomfort, and 58.9 % had moderate anxiety or depression.
Conclusions. COVID-19 has led to a significant decrease in the quality of life in patients with asthma and COPD. This may be associated with a worsening of the course of the disease and increase in the number of exacerbations of these pulmonary pathologies, resulting in significant limitation of mobility, growing pain or discomfort, as well as the occurrence of severe anxiety or depression.
Keywords. Quality of life, bronchopulmonary pathologies, bronchial asthma, COPD, COVID-19.

Цель. Провести сравнительную оценку качества жизни пациентов с бронхиальной астмой и хронической обструктивной болезнью легких (ХОБЛ) в период до и после перенесенной инфекции COVID-19.
Материалы и методы. В ретроспективном динамическом сравнительном исследовании по принципу «от причины к следствию» проведен анализ данных 73 пациентов с установленным диагнозом бронхиальной астмы (БА) и 78 пациентов с диагнозом ХОБЛ, находившихся на лечении в Университетской клинической больнице № 4. У пациентов проводилась оценка качества жизни в период до и после перенесенной инфекции COVID-19 с помощью визуально-аналоговой шкалы от 0 до 100 баллов и с помощью универсального опросника EuroQol-5D оценивалась подвижность, способность к уходу за собой, привычная деятельность, выраженность боли/дискомфорта, наличие тревоги/депрессии в постковидном периоде.
Результаты. У пациентов с ХОБЛ до перенесенного COVID-19 среднее значение общего балла по визуально-аналоговой шкале составило 89,5 [83,8; 95], а после COVID-19 – 70 [64,5; 80]. Установлено, что в постковидном периоде 91 % лиц с ХОБЛ отмечали ограничения подвижности, 33,3 % – испытывали затруднения при уходе за собой, 65,4 % пациентов не могли заниматься привычной деятельностью, 60,3 % ощущали выраженную боль или дискомфорт, а у 29,5 % пациентов наблюдалась сильно выраженная тревога или депрессия. У пациентов с астмой до перенесенного COVID-19 среднее значение балла составило 90 [88,4; 91], а после – 75 [70,2; 80,2]. В постковидном периоде 71,2 % пациентов отмечали затруднения в передвижении, а 64,4 % – при уходе за собой, 54,8 % не могли заниматься привычной деятельностью. При этом 78,1 % пациентов испытывали боль или дискомфорт, а у 58,9 % установлена умеренная тревога или депрессия.
Выводы. Перенесенная инфекция COVID-19 привела к достоверному снижению качества жизни у пациентов с бронхиальной астмой и ХОБЛ, что может быть связано с утяжелением течения и увеличением числа обострений данных бронхолегочных заболеваний, приводящих к значительному ограничению подвижности, нарастанию боли или дискомфорта, а также возникновению выраженной тревоги или депрессии.
Ключевые слова. Качество жизни, бронхолегочные патологии, бронхиальная астма, ХОБЛ, COVID-19.

INTRODUCTION

Bronchial asthma and chronic obstructive pulmonary disease (COPD) are among the most common chronic diseases of the respiratory system, which, if severe, can lead to persistent loss of ability to work and disability of patients. During the COVID-19

pandemic, this group of patients was of particular concern due to the high risk of severe infectious pathology caused by the SARS-CoV-2 virus, which has a special tropism for the receptors of the cells of the respiratory tract mucosa, as well as due to the possible delayed consequences of the infection in this group of people.

According to the results of multicenter studies, patients with COPD were more likely to have a severe course of COVID-19 with possible adverse outcomes, including death [1–3]. However, the potential impact of COVID-19 on the course of COPD in the post-COVID period was of particular interest. According to the latest published studies, patients with COPD who have had COVID-19 experience an increased frequency and longer periods of exacerbations of this pathology in the late period against the background of the development of viral and bacterial complications, which leads to disease progression, as well as to a worsening of the general condition of this group of patients, and can significantly affect their quality of life [4; 5].

During the COVID-19 pandemic, bronchial asthma (BA) has shown itself to a lesser extent as a potential factor aggravating the course of coronavirus infection and increasing the risk of adverse outcomes [6; 7]. However, some patients also had cases of severe infection caused by the SARS-CoV-2 virus. In people with mild BA, this infection was most often asymptomatic or mild, but in patients with severe or uncontrolled BA, the risk of an unfavorable course of COVID-19 was significantly higher and in some cases was accompanied by a fatal outcome. According to recent studies, in the post-COVID period, the course of asthma in some patients becomes more severe and uncontrollable, symptoms of shortness of breath increase, there is a need to increase the stage of therapy, which can also negatively affect the quality of life in this group of patients [8; 9].

The aim of the study is to conduct a comparative assessment of the quality of life of patients with bronchial asthma and chronic obstructive pulmonary disease in the period before and after COVID-19 infection.

MATERIALS AND METHODS

A retrospective dynamic comparative study based on the "from cause to effect" principle involved 151 patients hospitalized at the University Medical Center No. 4 of Sechenov University in Moscow. A total of 73 patients with an established diagnosis of bronchial asthma who had previously had COVID-19, as well as 78 patients diagnosed with COPD and a history of COVID-19, were included in the study. The table presents a comparative characteristic of the patient groups by the main clinical parameters.

The selection of patients for participation in the study was carried out according to the following inclusion criteria: the patient's age was over 18 years, the presence of a made diagnosis of bronchial asthma or COPD, and a history of bronchial asthma or COPD, had a history of

Clinical characteristics of patients included in study

Patients' Group	Patients with COPD who have previously had COVID-19	Patients with bronchial asthma who have previously had COVID-19
Number of participants, abs.	78	73
Mean age (range, median age)	65.4 years old (40–88 years old, median – 65.5)	58 years (21–84 years old, median – 62)
Distribution by gender, abs.	Men – 53, Women – 25	Men – 27, Women – 46
Number of people in the acute stage, %	93.6	95

laboratory-confirmed coronavirus infection within a year prior to inclusion in the study, and consent to participate in the study.

Exclusion criteria: patient age under 18 years, presence of concurrent pulmonary disease, acute phase of viral or infectious disease, presence of oncological diseases, hypertension in the stage of decompensation, diabetes mellitus, chronic liver and kidney diseases, disability, pregnancy, refusal to participate in the study. Written informed consent was obtained from all patients who participated in the study. This study was approved by the local ethics committee of the FSAEI HE Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University) (protocol No. 01–22 dated 20.01.2022). The study was carried out in accordance with the code of ethics (Declaration of Helsinki).

Information was collected through oral questioning of patients using a universal validated questionnaire for a comprehensive assessment of quality of life EuroQol – 5D, supplemented by a visual analogue scale (VAS) from 0 to 100 points [10; 11]. This questionnaire allows to assess the health profile of patients according to five different parameters: mobility, self-care, usual daily activities, presence of pain or discomfort, feelings of anxiety or depression [12]. Each question has three levels of answers. An important feature of this questionnaire is the speed of its completion (from 2 to 5 minutes), an improved system for assessing psychometric characteristics, as well as the possibility of use in people with a wide range of diseases, including chronic pulmonary pathologies [13].

For statistical processing of the obtained survey results, IBM SPSS Statistics Version 20.0 software was used. The distribution was tested for normality using the Kolmogorov-Smirnov criterion.

Considering that most pairs were not normally distributed, medians and interquartile ranges (Me [Q_{25} – Q_{75}]) were calculated for quantitative variables, and categorical variables were presented as absolute values and percentages (%).

To determine statistically significant differences, nonparametric tests for paired comparisons (sign test and Wilcoxon test) were used. Results were considered statistically significant at $p < 0.05$.

RESULTS AND DISCUSSION

In patients with bronchial asthma, the average VAS Scale score was 90 [88.4; 91] before COVID-19 infection. In the post-COVID period, most patients in this group experienced a significant deterioration in well-being, which led to a decrease in the average score to 75 [70.2; 80.2] (Fig. 1). The difference in VAS scores before and after COVID-19 in patients with BA was significant. Using nonparametric sign tests and the Wilcoxon test, statistically significant differences were established between the VAS scores in patients from this group in the period before and after COVID-19 infection ($p < 0.05$).

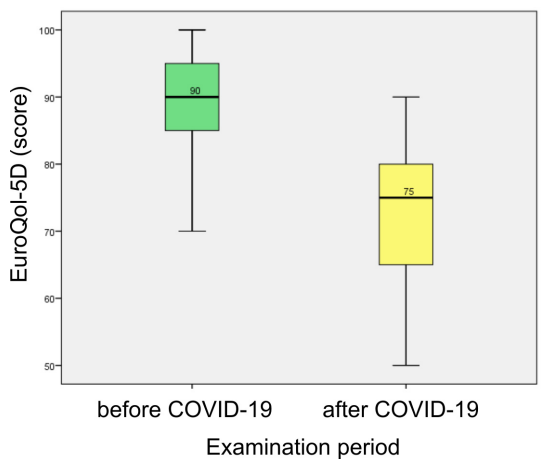

Fig. 1. Results of assessing the quality of life in patients with BA in the period before and after COVID-19 using a visual analogue Scale (VAS)

When assessing individual parameters of the health profile using the EuroQol-5D questionnaire in patients with BA after COVID-19, it was found that 71.2 % noted some difficulties in independent movement, and 11 % could not move independently. Most patients with BA (64.4 %) can fully care for themselves, a third (32.9 %) have certain difficulties associated with care. Half of the patients in the study group (54.8 %) had certain limitations associated with the need to participate in their usual activities, and 34.2 % of patients with asthma cannot perform their usual physical activities due to the severity of this pulmonary disease. When assessing the severity of pain or discomfort mediated by asthma symptoms, it was found that 78.1 % of patients experienced moderate pain or discomfort, and 15.1 % of patients in this group had severe complaints. More than half of the patients (58.9 %) had moderate anxiety or depression, 8.2 % had severe symptoms, and 32.9 % of patients did not report anxiety or depression.

Among patients with COPD before COVID-19 infection, the average value of the total score on the visual analogue Scale (VAS) was 89.5 [83.8; 95]. In the post-COVID period, the average score on the Scale decreased significantly and was already 70 [64.5; 80] (Fig. 2).

It was found that the difference between the number of points in the period before and after COVID-19 in the group of patients suffering from COPD is statistically significant ($p < 0.05$).

According to the data obtained from the five-domain health profile assessment, it was found that 91 % of patients in the COPD group reported some difficulty in moving, and 9 % could not move independently without assistance. 57.7 % of patients with COPD had no difficulty in

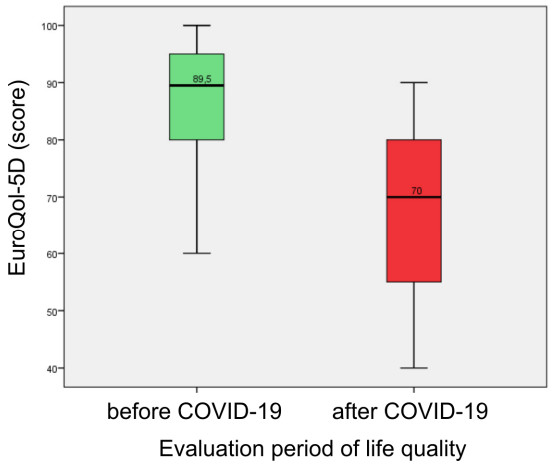

Fig. 2. Results of assessing the quality of life in a group of patients with COPD in the period before and after COVID-19 infection using a visual analogue Scale (VAS)

caring for themselves, 33.3 % reported some difficulty, and 9 % required assistance in caring for themselves. During the survey it was found that the majority of patients (65.4 %) could not perform their usual activities due to the severity of COPD symptoms, and 29.5 % experienced certain difficulties in performing daily activities, and only 5.1 % did not report such difficulties. In 60.3 % of patients from the COPD group, the presence of severe pain or discomfort associated with the severity of the disease was noted, in 38.5 %, pain or discomfort was moderate, and only 1.3 % of patients had no symptoms. Also, about a third of patients with COPD (29.5 %) noted severe anxiety or depression against the background of pulmonary disease, in the majority (62.8 %) these symptoms were moderately expressed, and were absent in 1.3 % of patients.

At present, there is an extremely limited number of publications in the literature devoted to the quality of life issue in patients with chronic pulmonary pathologies in the post-COVID period, which is associated with the novelty and poor study of the delayed consequences of COVID-19 in comorbid patients. Previously published works described the relationship between the degree of asthma control, as well as the number of COPD exacerbations and the level of quality of life of these patients [13; 14].

Thus, longer-term observation is needed in groups of patients with lung troubles who have had COVID-19, with repeated assessment of life quality in the delayed post-COVID period. In the future, additional studies will be required to identify a clear relationship between the severity of COVID-19, the worsening of BA and COPD symptoms in the post-COVID period and their impact on each individual parameter of life quality in these patients. The results obtained in the future will be able to provide additional information for improving methods for preventing delayed consequences of COVID-19 infection in individuals with chronic lung diseases.

Conclusions

After suffering from COVID-19, a reliable decrease in the indicator reflecting the quality of life was established in patients with bronchial asthma by 15 points and in patients with COPD by 19.5 points – as a result of the severe course and an increase in the number of exacerbations of these pulmonary pathologies in the post-COVID

period. Worsening of the course of asthma and an increase in its symptoms and COPD, in turn, lead to a significant limitation of mobility, increased pain or discomfort, as well as the emergence of symptoms of anxiety or depression.

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