

SUPPLEMENTARY MATERIAL

Impact of the COVID-19 pandemic on the clinical features of patients with chronic obstructive pulmonary disease: an observational cross-sectional study

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Supplementary Table 1. Sociodemographic characteristics and risk factors relevant to chronic obstructive pulmonary disease (n=98).

Parameters	Mean±SD or n (%)
Age	62±12.6
Sex, men	55 (56.1%)
Height (cm)	166.3±9.2
Weight (kg)	76.3±13.3
BMI (kg/m ²)	26.8±5.5
Education	
High school	37(37.8%)
College	37(37.8%)
University	24(24.5%)
Residence	
Urban	71 (72.4%)
Bostandyk district	12 (12.2%)
Auezov district	12 (12.2%)
Alatau district	10 (10.2%)
Zhetysu district	7 (7.1%)
Turksib district	7 (7.1%)
Almaly district	7 (7.1%)
Nauryzbay district	8 (8.2%)
Medeu district	8 (8.2%)
Rural area	27(27.6%)
Employment status	
Employed	45 (45.9%)
Unemployed, home maker, others	12 (12.2%)
Retired	41 (41.8%)
Family income	
Low	55 (56.1%)
Medium	40 (40.8%)
High	3 (3.1%)
Smoking status	
Current smokers	31 (31.6%)
Ex-smokers	35 (35.7%)
Never smokers	32 (32.7%)
Smoking index (pack·year)	28.2
Use of fossil fuel for heating and cooking	34 (34.7%)
Physical activity level	
Moderate	61 (62.2%)
Intensive	37 (37.8%)
Healthy eating advocates	55 (56.1%)

SD, standard deviation; BMI, body mass index.

Supplementary Table 2. Clinical characteristics of chronic obstructive pulmonary disease patients (n=98) at the end of COVID-19 pandemic.

Parameters	Mean±SD or n (%)
Respiratory symptoms	
Cough with sputum	92 (93.9%)
Shortness of breath or wheezing	76 (77.6%)
Dyspnea in daily life	97 (99%)
Chest pain	11 (11.2%)
CAT score	
0-9	5 (5.1%)
10-19	20 (20.4%)
20	73 (74.5%)
Vaccination status	
Vaccination against COVID-19	41 (41.8%)
Influenza vaccination	12 (12.2%)
Vaccination against Streptococcus Pneumoniae	4 (4.1%)
Spirometry function (post-bronchodilator)	
FEV1/VC, %	49.5±17.9
FEV1, % predicted	42.7±25.2
FVC, % predicted	53.1±29.9
GOLD Stage	
GOLD I	4 (4.1%)
GOLD II	27 (27.6%)
GOLD III	31 (31.6%)
GOLD IV	36 (36.7%)
Exacerbation in the past year	
0-1	16 (16.3%)
2	82 (83.7%)
Pharmacological Treatment	
Inhaled SABA	53 (54.1%)
Inhaled SAMA	45 (45.9%)
ICS/LABA	35 (35.7%)
LAMA	40 (40.8%)
Oral and parenteral glucocorticosteroids	15 (15.3%)
Blood Routine Characteristics of COPD	
WBC count (×10 ⁹ /L)	9.1±2.6
RBC count (×10 ¹² /L)	4.6±0.4
Hemoglobin (g/L)	136.1±15.4
Platelet count (×10 ⁹ /L)	287.3±67.3
Neutrophil%	67.9±5.4
Lymphocyte%	18.6±7.2
Eosinophil%	5.1±1.3

FVC, forced vital volume; SABA, short-acting β 2-agonist; SAMA, short-acting muscarinic antagonist; ICS, inhaled corticosteroids; LABA, long-acting β 2-agonists; LAMA, long-acting muscarinic antagonists; WBC, white blood cells; RBC, red blood cells.

Supplementary Table 3. Comorbidities in chronic obstructive pulmonary disease patients.

Diseases	N (%)
Hypertension	65 (66.3%)
Ischemic heart disease	33 (33.7%)
Diabetes	7 (7.1%)
Bronchiectasis	4 (4.1%)
Pneumonia	4 (4.1%)
Anemia	6 (6.1%)
Peptic ulcer	6 (6.1%)
Past COVID-19	30 (30.6%)

Supplementary Table 4. Multiple linear regression analysis.

Variable	Standard error	t value	p value	Standard error	t value	p value
	CAT score			Charlson Comorbidity Index		
Age	0.1	1.303	0.197	0.016	7.627	<0.001
BMI	0.166	0.867	0.389	0.042	0.833	0.407
Smoking status	1.839	2.46	0.017	0.212	-0.265	0.792
Education	0.925	-0.184	0.855	0.289	0.659	0.512
Family income	1.32	0.843	0.401	0.408	-0.499	0.619
Physical activity level	1.496	0.925	0.357	0.478	0.766	0.44
COVID-19	1.388	2.85	0.005	0.471	0.096	0.924
Charlson Comorbidity Index/CAT	0.502	0.291	0.772	0.027	-0.664	0.508

Supplementary Table 5. Comparison of characteristics between chronic obstructive pulmonary disease patients: 1) before (n=124) and at the end of COVID-19 pandemic (n=98); 2) with (“+”) and without (“-”) a history of confirmed COVID-19.

Parameters	COPD patients in pre-COVID-19 period (n=124)	COPD patients at the end COVID-19 pandemic (n=98)	P value	COPD patients at the end COVID-19 pandemic (n=98)		P value
				COVID-19 “+” (n=30)	COVID-19 “-” (n=68)	
Age (years)	61.3±11.8	62.0±12.6	>0.05	62.9±11.6	61.8±10.3	>0.05
Gender						
Male	69 (55.6%)	55 (56.1%)	>0.05	16 (53.3%)	38 (55.9%)	>0.05
Female	55 (44.4%)	43 (43.9%)		14 (46.7%)	30 (44.1%)	
Smoking status						
Current smokers	38 (30.6%)	31 (31.6%)	>0.05	5 (16.6%)	25 (36.8%)	>0.05
Former smokers	44 (35.5%)	35 (35.7%)		12 (40%)	23 (33.8%)	
Never smokers	37 (29.8%)	32 (32.7%)		13 (43.3%)	20 (29.4%)	
Biomass exposure						
Indoor biomass fuel use	40 (32.3%)	34 (34.7%)	>0.05	11 (36.7%)	23 (33.8%)	>0.05
Exacerbation in the past year						
0-1	29 (23.4%)	16 (16.3%)	>0.05	6 (20%)	10 (14.7%)	>0.05
2	95 (76.6%)	82 (83.7%)		24 (80%)	58 (85.3%)	
Spirometry function						
FEV1/VC, %	57.4±15.4	49.5±17.9	>0.05	48.7±18.4	50.3±17.1	>0.05
FEV1, % predicted	53.6±23.3	42.7±25.2		41.4±24.3	42.9±25.8	
FVC, % predicted	61.8±22.5	53.1±29.9		53.8±28.7	52.6±30.1.	
GOLD Stage						
GOLD I	9 (11.1%)	4 (4.1%)	0.017	2 (6.7%)	5 (7.4%)	>0.05
GOLD II	17 (21%)	27 (27.6%)		11 (36.7%)	23 (33.8%)	
GOLD III	38 (46.9%)	31 (31.6%)		9 (30%)	26 (38.2%)	
GOLD IV	17 (21%)	36 (36.7%)		8 (26.7%)	14 (20.6%)	
Comorbidities						
Hypertension	43 (34.7%)	65 (66.3%)	<0.001	20 (66.7%)	45 (66.2%)	>0.05
Ischemic heart disease	24 (19.4%)	33 (33.7%)	0.016	12 (40%)	21 (30.9%)	>0.05
Asthma	14 (11.3%)	14 (14.3%)	>0.05	3 (10%)	11 (16.2%)	>0.05
Chronic cor pulmonale	12 (9.7%)	8 (8.2%)	>0.05	2 (6.7%)	6 (8.8%)	>0.05
Diseases of the gastrointestinal tract (chronic gastritis, peptic ulcer, chronic cholecystitis, chronic pancreatitis)	9 (7.3%)	21 (21.4%)	0.003	9 (30%)	12 (17.7%)	>0.05
Diabetes	4 (3.2%)	7 (7.1%)	0.182	1 (3.3%)	6 (8.8%)	>0.05
Anemia	1 (0.8%)	6 (6.1%)	0.025	1 (3.3%)	5 (7.4%)	>0.05
Bronchiectasis	1 (0.8%)	4 (4.1%)	0.568	1 (3.3%)	3 (4.4%)	>0.05
Pneumonia	3 (2.4%)	4 (4.1%)	0.568	0	4 (5.9%)	-

Charlson						
Comorbidity Index	74 (59.7%)	11 (11.2%)		4 (13.3%)	7 (10.3%)	
0-1	35 (28.2%)	15 (15.3%)	<0.001	4 (13.3%)	11 (16.2%)	>0.05
2	15 (12.1%)	72 (73.5%)		22 (73.3%)	50 (73.5%)	
3						
Chest X-ray						
Pneumosclerosis	42 (33.9%)	37 (54.4%)		14 (46.7%)	23 (33.8%)	
Emphysema	19 (15.3%)	18 (26.5%)		6 (20%)	12 (17.6%)	
Bronchiectasis	3 (2.4%)	4 (4.1%)		1 (3.3%)	3 (4.4%)	
Lymphadenopathy	3 (2.4%)	11 (16.2%)	>0.05	8 (26.7%)	3 (4.4%)	>0.05
Pneumonia	3 (2.4%)	4 (5.9%)		1 (3.3%)	3 (4.4%)	
Residual changes after tuberculosis	2 (1.6%)	3 (4.4%)		1 (3.3%)	2 (2.9%)	

Supplementary Table 6. Demographic characteristics of chronic obstructive pulmonary disease patients according to degrees of airflow limitation at the end of the COVID-19 pandemic.

Parameters	GOLD 1, n=4 (4.1%)	GOLD 2, n=27 (27.6%)	GOLD 3, n=31 (31.6%)	GOLD 4, n=36 (36.7%)	p value
Age	64.8±7.72	61±11.32	64.8±11.7	62.3±11.9	>0.05
Male (%)	2 (50%)	15 (55.6%)	16 (51.6%)	22 (61.1%)	>0.05
BMI	25.1±4.0	27.1±6.5	27.3±5.7	25.6±4.9	>0.05
Smoking index (pack·year)	28±5.3	26±13.8	29.4±12.5	34.6±11.4	>0.05
mMRC	1.8±0.9	2.4±1.5	3.1±1.1	3.6±0.9	>0.05