

# Case history of a 93-year-old patient with multicomorbide pathology after COVID-19

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## Abstract

Comorbid pathology and elderly age are associated with severe or complicated COVID-19 infection and high mortality, including in the period after discharge from the hospital. Decompensation of comorbid illnesses, compounded by post-COVID symptoms, is associated with patient's loss of ability for self-care and the need for palliative care. The paper presents the clinical history of an elderly patient with post-COVID symptoms and decompensation of comorbidities.

**Key words:** Comorbidity, postcovid syndrome, palliative care

## Introduction

Since the beginning of the COVID-19 pandemic, there have been reports of disease symptoms persistence and/or the appearance of new symptoms after recovery in some patients following COVID-19, including in a mild form [1–4]. At the suggestion of the patients themselves on social networks and the mass media, the term “long COVID” became widely used. Later, in December 2020, the National Institute for Health and Care Excellence (NICE) in Great Britain was the first to propose a classification of post-COVID conditions [5]: acute COVID-19 (symptoms lasting up to four weeks); ongoing secondary COVID-19 (symptoms lasting 4 to 12 weeks); post-COVID syndrome (symptoms with onset during and after the COVID-19 infection, lasting more than 12 weeks and not explained by an alternative diagnosis). Post-COVID syndrome is included in the ICD-10 under the heading U09.9 Post COVID-19 condition, unspecified.

Post-COVID syndrome is deemed as a multisystem disease. The variety of the described symptoms is extremely wide and includes functional (decreased activity, rapid fatigability, paralyzing weakness), respiratory (dyspnea, cough), neurological (impaired smell and taste, thermoregulation disorders, etc.), cardiovascular (pressure fluctuations, postural tachycardia, etc.), skin (various lesions), gastrointestinal (anorexia, diarrhoea), cognitive (“lightheadedness”,

memory loss) and psychological (anxiety, depression, panic attacks, etc.) manifestations [2,6,7].

The complexity of post-COVID syndrome symptoms in most cases is very similar to systemic inflammatory response syndrome, myalgic encephalomyelitis and chronic fatigue syndrome [8]. There are several hypotheses explaining the development of post-COVID syndrome. Frequent explanations for the manifestations of post-COVID syndrome are the result of direct damage to organs by coronavirus, as well as (in severe cases) the consequences of aggressive medical therapy, mechanical ventilation, multiple system organ failure, and misuse of medicines, in particular antibiotics. Nevertheless, a large number of symptoms are not related to the course of the disease in the acute period and the amount of care provided. According to another hypothesis, the development of the syndrome is associated with the onset of hypercoagulable syndrome, formation of microthrombi and their lysates triggering the reemergence of systemic inflammation. There are also discussions on the neurotropic nature of the virus and the development of various symptoms due to primary damage to the brain neurons and large nerves. Finally, the excessive activation of the immune system and autoimmune reactions can act as a trigger.

Research has revealed that post-COVID syndrome affects a significant number of patients following COVID-19 infection, regardless of age, severity of the

disease, and laboratory changes [9,7]. Elderly people, especially patients with extensive poly- and/or comorbid pathology, represent the most sensitive category of patients experiencing a complicated course of COVID-19 and formation of the post-COVID syndrome [10]. The Order of the Ministry of Health and the Ministry of Labor and Social Protection of the Russian Federation No. 345n/372n “Concerning approval of the Regulation on the organization of palliative care, including the procedure for interaction between medical institutions, social service organizations and public associations, other non-profit organizations operating in the field of healthcare” dated May 31, 2019, approved medical indications for palliative care to patients with untreatable degenerative diseases. However, in a number of cases, the need to provide palliative care to patients recovered from COVID-19 and having not previously been followed by specialized palliative care services suggests developing a common approach to their identification and treatment of this cohort of patients.

Presented is a clinical case of an elderly patient with a comorbid pathology who has not previously received palliative care, was developed COVID-19 infection and was admitted to the palliative care unit for persistent symptoms and impaired self-care functions.

## Case Description

Patient I., 93 years old with virus-identified COVID-19 infection consequences, was admitted to the palliative care unit of the Sechenov University Clinical Center on June 10, 2021. Height – 182 cm, weight – 66 kg, BMI=19.9 kg/m<sup>2</sup>, inhabitant of Moscow living with his daughter. He has two daughters, adult grandchildren. Disability of 2nd class.

### Complaints at admission

At the time of admission, the patient complained of general weakness and helplessness, wet cough, laboured breathing at the slightest physical exertion, recurrent abdominal pain, poor appetite and constipation.

### Case History

The patient had suffered since April 2021, when general weakness, laboured breathing, and fever appeared. On the tenth day of illness, he was taken by an emergency medical service team to a Moscow hospital for COVID patients in a critical condition with worsening dyspnea, fever, headache. The lungs CT examination in the hospital (dated April 19, 2021, at admission) revealed signs of bilateral interstitial lung infiltration (CT-3). Diagnosis: U07.1 – virus identified COVID-19 infection, pneumonia. C-reactive protein – 164 mg/l; leukocytes –  $8.3 \cdot 10^9/l$ , hemoglobin – 13.6 g/l, erythrocytes –  $4.6 \cdot 10^{12}/l$ .

At the hospital, the patient was treated with antibiotics, antiviral, antifebrile medicines, anticoagulants, expectorants, gastroprotectors, sedatives,

oxygen. The positive changes after the performed treatment were confirmed by CT of the lungs dated June 2, 2021: improvement in the course of bilateral multisegmental viral pneumonia (incl. COVID-19) – CT-3, with a tendency toward recovery; right-sided pleural effusion. June 03, 2021: C-reactive protein – 1 mg/l; leukocytes –  $5.5 \cdot 10^9/l$ , hemoglobin – 12.9 g/l, erythrocytes –  $4.42 \cdot 10^{12}/l$ .

The patient was discharged from the hospital with continuing complaints of general weakness, helplessness, abdominal pain, loss of appetite, weight loss with recommendations for further intake of Meldonium, anticoagulants, gastroprotectors, expectorants and antihypertensive agents.

The patient needed around-the-clock nursing care and treatment for severe disease manifestations. At the request of his daughter, on June 10, 2021, the patient was admitted to the palliative care unit due to the impairment of independent movement and self-care.

### Data from the initial examination in the palliative care unit

Overall health status is of moderate severity, body temperature – 36.6°C. Mentally alert, cognitively impaired. The patient is communicative, answers to the point when asked, MMSE – 13 points. Active within the bed, can independently turn over on his side, sits down with help, the Karnofsky score is 30–40%. Skin and visible mucous membranes are of normal colour, with no abnormal eruption, Norton scale – 12 points. Lymph nodes are not palpable. No peripheral edema. Breathing is rhythmic, with a respiratory rate of 18–20 bpm. Oxygenation is 89–91% when breathing atmospheric air. In the lungs, vesicular respiration, complicated, scattered dry rales. Muffled heart tones, rhythmic, with a heart rate of 74 per minute. BP 120/65 mm Hg on antihypertensive therapy. The abdomen is soft, moderately painful in the mesogastric and in the left iliac region, paroxysmal pain syndrome 3–5/10 as per VAS on the background of occasional NSAIDs use. No peritoneal signs. The lumbar tapping symptom is negative on both sides. Urination is unimpeded, painless. Urination is not controlled; the patient uses diapers. His appetite is decreased. PCR test for SARS-CoV-2 is negative.

### Diagnosis

**Main diagnosis:** Cerebrovascular disease. Chronic cerebral ischemia. Dyscirculatory encephalopathy stage 3. Decompensation with vestibular-ataxic syndrome, cognitive impairment. Consequences of earlier coronavirus infection.

**Background:** Essential hypertension, stage 3, grade 1, risk of cardiovascular complications – 4. Atherosclerosis of aorta, coronary, cerebral vessels.

**Complications:** CHF 2 A, NYHA III. Pulmonary fibrosis. Respiratory distress of stage 2. Antibiotic-associated colitis.

**Secondary diagnosis:** IHD: exertional angina of functional class 2. Obliterating atherosclerosis of lower extremity arterial disease. Gallstone disease. Chronic calculous cholecystitis, non-acute. Chronic gastritis, non-acute. Prostate hyperplasia. Chronic prostatitis.

### Treatment in the Palliative Care Unit

#### Pharmacological therapy

With reference to the diagnosis and the patient's condition, it was recommended to continue taking previously prescribed medications with minor correction after consultation with a surgeon, cardiologist and performing electrocardiographic examination:

Bisoprolol 5 mg per day  
Losartan 25 mg at a tendency to hypertension  
Rivaroxaban 10 mg per day  
Ambroxol 60 mg per day  
Omeprazole 40 mg per day

Regarding pain management, on admission NSAIDs, antispasmodic agents were prescribed, M-anticholinergic agent Platyphylline was used, with a slight positive effect on the first day of hospitalization. However, due to persisting pain syndrome, tramadol at an initial dose of 200 mg per day, followed by an increase to 400 mg per day was prescribed (Fig. 1).

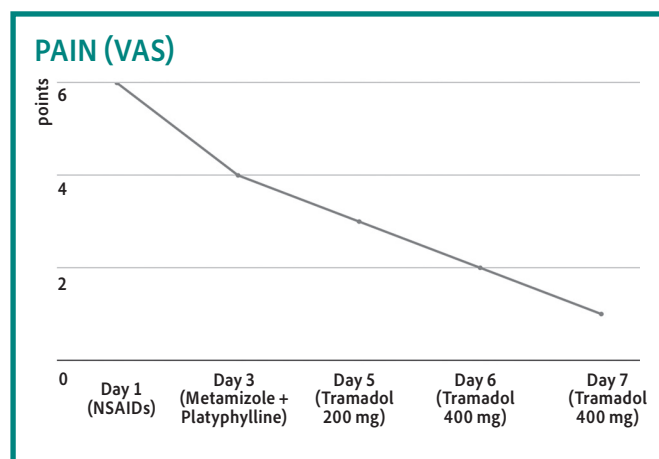


Figure 1 Scheme of pain management therapy from 1 to 7 days of hospitalization

#### Non-drug treatment:

Nursing care, prevention of bedsores, activation of sitting position. Massage, verticalization and therapeutic exercises with an instructor up to 5 days. In case of oxygenation decrease below 94% when breathing atmospheric air, inhalations with humidified oxygen were carried out. The patient was prescribed nutritional support in the form of oral enteral nutrition at the rate of 30 kcal/kg and 2 g of protein per 1 kg of body weight per day.

Psychological and spiritual support to the patient and his relatives were also provided. The patient's daughter visited her father every day, all the events

developed in her presence. The disease prognosis and the allocated therapy were discussed together with the patient. The patient's granddaughter (a doctor by profession) was involved in the treatment planning.

The relatives did not want to transfer the patient to a specialized clinic; they wanted a calm environment and quality care for him and supported the patient, who also did not want to be transferred to the intensive care unit.

#### Condition dynamics:

The patient's condition worsened during his seven days in the palliative care unit. General weakness persisted, some improvement in general condition was noted on days 2–3; however, starting from the 4th day, the patient felt an increase in pain syndrome, became less active. The patient had a tendency to hypotension, refused to eat and became inactive.

On June 17, in the presence of medical staff, the patient died.

## Discussion

From the very onset of the COVID-19 pandemic, it became clear that elderly people are at the highest risk for morbidity and mortality [11,1]. A meta-analysis of 46 observational studies involving 13,624 patients  $\geq$  60 years of age, published between December 2019 and May 2020, confirmed the adverse course and outcomes of COVID-19 in elderly patients [12]. In particular, a severe course of infection was observed in every second patient (51%, 95% CI 36–65%), and every fifth patient required resuscitation (22%, 95% CI 16–28%); mortality averaged 11% (95% CI 5–21%). 84% of patients required ventilatory support, and 21% of them underwent invasive mechanical ventilation. The most frequent comorbidities in patients were arterial hypertension (48%, 95% CI 36–60%), other cardiovascular diseases (19%, 95% CI 11–28%) and diabetes mellitus (22%, 95% CI 13–32%) – the most typical diseases of elderly persons.

Age and comorbidities are independent risk factors for death in COVID-19 patients after discharge from the hospital. In a British study, the mortality rate of patients within 28 days after discharge from the hospital was 13.4%, wherein 2/3 of them were over 75 years, and 81% of patients had two or more comorbid conditions [13]. In addition to age and comorbidity, high body mass index, increased C-reactive protein, and application of antibiotics were associated with statistically significant higher mortality in patients at the hospital stage and after discharge. In an Iranian study, the hospital mortality rate of patients with COVID-19 was 1.9% (25/1,078), and after discharge from the hospital, in a year, it increased to 9.2% (97/1,053); the leading causes of death were vascular and thromboembolic events [14]. Age was a predictor of long-term mortality in patients with COVID-19: the risk of death at the age of 50–60 was 2.03 times (95% CI 1.15–3.58), and at the age of over 60 years – 3.00 times (95% CI 1.75–5.16) higher in

comparison with patients under 50 years of age. In a national cohort study in Germany (8,679 patients, i. e. almost 1/3 of the country's population), the hospital mortality rate of patients with COVID-19 was 24.9% (2,161 people), after being discharged from the hospital, within 180 days, 29.6% of patients (2,566/8,679) died, while the highest mortality was among patients over 80 years old (52.3%, 1,472/2,817) and after invasive mechanical ventilation (53.0%, 853/1,608) [15]. The risk factors for 6-month mortality, in addition to age, were bleeding disorders, adipositis (body mass index more than  $\geq 40$  kg/m<sup>2</sup>) and the presence of comorbid pathology.

Considering the impact of comorbidity, it is necessary to take into account the negative effects of stay-at-home restrictions that limit the accessibility of inpatient care [16,17]. These circumstances could worsen the course of concomitant diseases, especially cardiovascular diseases, and result in more complications of COVID-19.

It has been observed that post-COVID syndrome occurs more often in young adult patients after suffering a mild or moderate infection and not requiring ventilatory support or critical care [8, 18]. Nevertheless, according to some reports, post-COVID syndrome can affect up to 1/5 of elderly patients. So, in a prospective cohort study involving 279 elderly people, it was found that 90 days after recovering from COVID-19, 66 (23.6%) patients noted the presence of at least one symptom, and 9.3% of respondents specified two and more disturbing symptoms [10]. The most common symptoms in the study population were weakness (8.9%), cough (4.3%), laboured breathing (1.8%), faintness (1.4%), myalgia (1.1%), anosmia and taste-blindness (0.8%) and chest discomfort (0.7%).

In practice, in an elderly COVID-19 patient, it is necessary to differentiate the signs of comorbidity progression and the post-COVID syndrome symptoms. Decompensation of concomitant pathology requires appropriate disease-focused and symptomatic therapy. As for the post-COVID syndrome, it is generally accepted that this condition is in most cases reversible by itself, although the process goes slowly [8]. In young, relatively healthy individuals, special therapy for the post-COVID syndrome is often not required, or non-drug methods of correction are used, and pharmacotherapy is needed only in cases of persistent symptoms. Elderly patients, in whom post-COVID symptoms compound "age-related" impairments, forming a common complex of symptoms requiring more intensive therapy [19].

The treatment of post-COVID syndrome should be individualized according to the group of clinical signs and symptoms. WHO experts have prepared recommendations for the COVID-19 treatment, in which separate chapters are devoted to the treatment of elderly patients, the rehabilitation of patients having recovered from COVID-19, the principles of therapy for obstinate symptoms, and palliative care for patients with COVID-19 [20]. A number of documents regulating the care management of patients having had COVID-19,

developed by the Ministry of Health of the Russian Federation: temporary guidelines of the Ministry of Health of the Russian Federation on the prevention, diagnosis and treatment of new coronavirus infection (COVID-19) [21], temporary guidelines for the rehabilitation of patients with coronavirus infection [22], order of the Ministry of Health of the Russian Federation No. 698 of 07/01/2021 on periodic health examination [23]. Nevertheless, effective treatment protocols for most of the symptoms of post-COVID syndrome have not yet been developed.

In the presented case history, an elderly patient with symptoms of weakness and fatigue showed signs of increasing decompensation of cerebrovascular disease, increased abdominal pain, presumably associated with antibiotic-associated colitis.

The differential diagnosis of abdominal pain in the patient under consideration should include antibiotic-associated colitis, ischemic colitis, and post-COVID syndrome. The use of NSAIDs for the management of unspecified abdominal pain in a patient with coronary heart disease and stroke is contraindicated. In this regard, the choice of metamizole, a pure non-opioid analgesic with antispasmodic properties, in combination with the M-anticholinergic platifillin is justified along with aggressive laxative therapy in light of his baseline constipation. The duration of the metamizole treatment did not exceed 5 days (which corresponds to the recommendations for the use of the drug) with a further crossover to the weak opioid tramadol in an increasing dose due to the persistence of the pain syndrome.

To reduce the manifestations of weakness and fatigue, the metabolic drug Meldonium was prescribed. It is known that the drug has a stimulatory effect on the central nervous system and increases physical activity and resistance to stress. At the cellular level, the drug reestablishes the balance between the delivery and cells demand for oxygen, which has a positive effect on the ischemic myocardium. Abroad, in a number of countries, palliative patients with weakness and fatigue, symptoms of soft depression, psychostimulant agents such as methylphenidate are used (in the Russian Federation it belongs to List I of narcotic drugs, psychotropic substances and their precursors, the circulation of which in the Russian Federation is prohibited (Resolution of the Government of the Russian Federation of No. 681 dated June 30, 1998). In this patient with concomitant cardiac pathology, including ischemic heart disease, incomplete right bundle branch block, the use of a psychostimulant with a pronounced sympathomimetic effect would be inappropriate.

This case history highlights the role of palliative care in managing patients with COVID-19, especially older people with multicomorbidities, who are most vulnerable to the complicated course of the disease. In these patients, it is important to plan treatment in

advance, with reference to the person's values and goals as much as possible. In this regard, it is essential to timely identify patients requiring palliative care against the background of optimal treatment of a somatic disease with a medical commission and referral to palliative care according to established order [24,25]. Thus, it is necessary to timely discuss the prognosis of the disease with the patient and family and, if necessary, prepare them for the expected outcome. In addition, a number of similar patients admitted to hospitals in critical condition refuse aggressive treatment. In Western countries, during the pandemic, has appeared the practice of including palliative physicians in the ICU team to provide such patients with the options of symptomatic treatment and supportive therapy. The palliative care physician discusses treatment strategies with the patient and his relatives, can protect the patient from undesired invasive treatment – endotracheal intubation, invasive mechanical ventilation. Last but not least, it can provide such patients with relief from suffering and dying with dignity.

In palliative care, as an interdisciplinary approach, much attention is paid to the nursing plan of managing such patients. Due to cognitive decline, management of the patient and his comfort by nurses is extremely important. Dehydration, constipation, laboured breathing in a patient can be very distressing; even an extra blanket if the patient is cold can be of great importance. We should not forget that the family, as a system in which the patient exists, also needs psychological support and follow-up, and supporting the spirit of relatives can have a positive effect on the patient's condition [26]. The imbalance in the existence of an older person with a number of chronic diseases and acute illness unbalances his relatives, gives rise to anxiety, fears and hopes among relatives. Providing both the patient (if the condition permits and upon the request) and his family with adequate information about the course of the disease and the likely prognosis can give them the opportunity to make the most of the time they have together. That can also facilitate a healthier grieving experience for the family.

In the near future, an increase in the number of non-cancer patients in need of palliative care is expected due to the decompensation of chronic diseases including after COVID-19 infection. For this reason, the analysis of this clinical case history is important to understand the relevance of palliative care for these patients and to develop strategies for their management.

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