MedCrave
Step into the World of Research
International Journal of Family & Community Medicine

Case Report

Post-COVID-19 Syndrome - case report

Abstract

Background: Coronaviruses are enveloped RNA viruses that are widely distributed among humans and other mammals and birds causing respiratory, enteric, liver, and neurological diseases. At the end of December 2019, a group of patients with pneumonia of unknown etiology were registered, where a new virus called SARS-CoV-2 was later presented, and the disease it causes, COVID-19. The main clinical manifestations of this virus are fever, dry cough, dyspnea and acute respiratory stress. Many subjects have mild symptoms, such as headache, non-productive cough, fatigue, myalgia, and anosmia. The recovery time from this disease and the reasons why the sequelae it leaves vary so much between patients is still unknown. Symptoms and clinical manifestations after SARS-CoV-2 / COVID-19 infection have appeared in many survivors and are similar to those of fatigue after Severe Acute Respiratory Syndrome. The most commonly reported symptoms are fatigue, anxiety, joint pain, ongoing headache, chest pain, dementia, depression, and dyspnea. The NICE guideline defines post-COVID-19 syndrome as the set of signs and symptoms that develop during or after an infection compatible with COVID-19 that continues for more than 12 weeks and is not explained by an alternative diagnosis. Post-COVID-19 syndrome has the characteristic that its symptoms cause a disability, which is why it generates a great impact on the individual, the care, and rehabilitation units.

Purpose: The objective of this report is to present a clinical case of a patient with the post-COVID-19 syndrome and its management.

Materials and methods: This is a 57-year-old female patient, with a previous history that in June 2021 began with a clinical picture consisting of asthenia, adynamia, anosmia, ageusia, headache, myoarthralgia, nausea, cough chest and lumbar pain, for which the PCR test for SARS-CoV-2 was performed, which was positive, his clinical picture worsened at home, for which he consulted an emergency service in the city of Palmira, Valle del Cauca (Colombia). Subsequently, they conclude through paraclinical SARS-CoV-2 infection plus bacterial pneumonia due to Klebsiella pneumoniae, for which she is transferred to the hospitalization room and treatment with antibiotics is started, however, At the beginning of July, the patient maintained hemodynamic and ventilatory stability, without cardiovascular support, but still with minimal ventilatory support, with oximetry goals, so it was decided to start the gradual withdrawal of sedatives in favor of spontaneous modes of mechanical ventilation. On July 6, the patient tolerates extubation with the transition to non-invasive mechanical ventilation and a decision was made to transfer to hospitalization. Then, on July 15, a patient was seen in acceptable general conditions, with support even by nasal cannula, on physical examination with attenuated vesicular murmur with declining rales, for which it was decided to discharge.

Results: Currently, the patient manifests 15 symptoms 4 months after her discharge from the clinic.

Conclusions: The post-COVID-19 patient must have an individual and comprehensive rehabilitation, which takes into account their needs, since this syndrome varies from person to person, it must be an early rehabilitation so as not to decrease the functionality of the patient, and does not deteriorate their physical or mental health. The great challenge identified in the midst of the pandemic is that work must be done to build an improved and strengthened health system, where true integration and coordination between levels of care, primary care, and hospital care is achieved.

Keywords: COVID-19 virus disease, coronavirus, COVID19, COVID-19 pandemic, case reports

Volume 6 Issue 4 - 2022

Danna Isabella Rebolledo- Cifuentes,[1] María Fernanda Rúa- Bañol,[1] Pedro Andrés Molano Agudelo[3]

[1]Medical Student, Santiago de Cali University, Palmira, Colombia
[2]Professor, Santiago de Cali University, Palmira, Colombia

Correspondence: Pedro Andrés Molano Agudelo, Professor, Santiago de Cali University, Carrera 29 # 38-47, Palmira, Valle del Cauca, Colombia, Tel (+57 2) 518 3000, Email pedro.molano00@usc.edu.co

Received: June 26, 2022 | **Published:** August 04, 2022

Introduction

Coronaviruses are enveloped RNA viruses that are widely distributed among humans and other mammals and birds causing respiratory, enteric, liver, and neurological diseases. Six species of coronavirus are known to cause human illness. Four viruses, 229E, OC43, NL63, and HKU1, are prevalent and generally cause common cold symptoms in immunocompetent individuals. The other two strains, severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), are zoonotic in origin and have been linked to sometimes fatal illnesses. Given the high prevalence and wide distribution of coronaviruses, the great genetic diversity and frequent recombination of their genomes, and the increased activities of the human-animal interface, At the end of December 2019, a group of patients with pneumonia of unknown etiology were registered, epidemiologically linked to a seafood market and other types of wild animals traditionally consumed in Wuhan, China. On December 31, 2019, the Chinese Center for

Disease Control and Prevention (China CDC) sent a group to the city to conduct an epidemiological and etiological investigation. Subsequently, they presented a new virus, the evidence of the presence of this virus includes the identification in bronchoalveolar lavage fluid in three patients by using complete genome sequencing, direct PCR, and culture.[1]

In February 2020, an official taxonomic name was established for the new virus: 'severe acute respiratory syndrome (SARS)-associated coronavirus (CoV) type 2' (SARS-CoV-2), and the disease it causes, COVID-19. The World Health Organization declared the international epidemic on January 30, 2020, and subsequently a global pandemic.[2] This caused worldwide health emergency measures to be initiated. It should be noted that the incubation period for this virus can be up to 14 days (average 5-7 days) from exposure to onset of symptoms. It is estimated that 95% of people with COVID-19 who have symptoms will do so within 11.5 days of SARS-CoV-2 infection. The manifestations and intensity of these vary from person to person, a large part of the population will be asymptomatic (30-40%)9. The main clinical manifestations of COVID-19 are fever, dry cough, dyspnea, and acute respiratory stress. However, many infected individuals may present with mild symptoms, including headache, nonproductive cough, fatigue, myalgia, and anosmia. Some patients may develop a severe acute respiratory syndrome a week after the onset of symptoms and it can be fatal.[2] Throughout this time, various neurological complications have been described in the acute phase: encephalopathy, delirium, inflammatory syndromes of the central nervous system, encephalitis, Guillain-Barré syndrome, and stroke.

Overall mortality is estimated at 8% and is due to respiratory failure with hypoxia or multiple organ failure. According to the World Health Organization (WHO) in its epidemiological update on the coronavirus disease (COVID-19) of October 30, 2021, it reports that from the confirmation of the first cases of COVID-19 until epidemiological week 42, which ended on October 23, 2021, 243,327,429 cumulative confirmed cases of COVID-19 were reported globally, including 4,943,742 deaths. 38.2% of cases and 46.1% of global deaths were reported by the Region of the Americas.[3–12] In this period, according to the WHO report, the number of notified cases decreased in all subregions except in the South America subregion, where an increase of 5.7% was observed. North America continued to report the largest number of new cases in this period (3,663,638, or 74.3% of the cases reported in the Region). In South America, on the contrary, an upward trend was observed in the number of reported cases.[12] In this bulletin, Brazil reported 632,197 cases, followed by Colombia with 50,425 cases and Venezuela with 45,210 cases, these countries being the main contributors to the number of cases in this subregion. Brazil was the country with the highest number of deaths in this subregion during this period, with 15,566 deaths, followed by Argentina reporting 1,533 deaths and Colombia with 1,168 deaths.[12]

According to the World Health Organization, COVID-19 is usually more serious in people over 60 years of age or who have health problems such as high blood pressure, cardiovascular or pulmonary problems, diabetes, obesity, or cancer.[13] To establish the diagnosis of COVID-19, an epidemiological history, clinical manifestations, and confirmation of exposure to SARS-CoV-2 are needed. In the current context, the diagnosis of COVID-19 should be considered in anyone who presents with fever, dry cough, fatigue, and dyspnea. The real-time RT-PCR technique and genomic sequencing techniques are the two tests used to confirm the diagnosis of COVID-19.[2] It is important to reduce the spread of SARS-CoV-2 / COVID-19, for which standard precautionary measures must be followed. The main mode of transmission of COVID-19 infection is through direct person-to-person contact or exposure to respiratory droplets or fomites. Therefore, it is recommended to maintain the necessary good personal and environmental hygiene practices and to implement strict precautions to avoid contact. For this, close contact with infected people should be avoided, do not touch your eyes, nose, and mouth frequently, cover yourself with a tissue when coughing or sneezing, and after that, discard the used tissue in the garbage can. Appropriate cleaning and disinfection procedures should be followed frequently for objects, fomites, and touched/contaminated surfaces by employing disinfectant household cleaners. In addition, airborne precautions (hand hygiene, gown, gloves, N95 masks, and eye protection) should be implemented for exposure of patients with mild SARS-CoV infection if aerosol-generating procedures are to be performed in the community. and health workers.[10]

After more than a year of pandemic, there is another form of prevention against SARS-CoV-2, which is vaccination. Several candidate vaccines have been developed, using nucleic acids (DNA and RNA), viral vectors (replicating and non-replicating), virus-like particles, peptide-based recombinant proteins, live attenuated and inactivated virus modalities. Four vaccines have obtained emergency use authorization, 87 are in clinical development and 186 are in preclinical development. The vaccines that have obtained authorization are BNT162b2 mRNA (Pfizer / BioNTech), mRNA-1273 (Moderna), ChAdOx1 nCoV-19 (Vaxzevria, AstraZeneca) and Ad26. VOC2. S (Janssen/Johnson & Johnson). Although concerns have been raised about unusual blood clots and low platelet counts, the benefits of COVID-19 vaccines outweigh the potential risks of adverse events. The appropriate dose and regimen strategy are still being investigated.[11] For the treatment of SARS-CoV-2 infection, few conclusive controlled clinical trials are currently available that allow evidence-based recommendations to be made. In this context, decision-making must follow the recommendations of the health authorities, based on the available evidence.[7]

Patients with SARS-CoV-2 infection or suspected infection should receive symptomatic treatment, associated with the intensification of hygiene and hydration measures. Symptomatic treatment includes antipyretics and analgesics for fever, myalgia, and headaches. Paracetamol is preferably used, since it has a better safety profile than non-steroidal anti-inflammatory drugs (NSAIDs) in terms of cardiovascular, hemorrhagic, and renal risk, especially in the elderly or multimorbidity.[7] One of the drugs used is remdesivir, a nucleotide analog antiviral that slows viral RNA replication. Compassionate use has been made for the treatment of hospitalized patients with SARS-CoV-2 infection, it was recommended to prioritize its use for treatments with a maximum duration of 5 days, in hospitalized patients with severe pneumonia.[7] In COVID-19, an increase in inflammatory markers has been described, which has been related to a worse prognosis and some patients evolve with acute respiratory distress syndrome. For this reason, it was proposed that corticosteroids could have a benefit in SARS-CoV-2 infection, although the evidence on the effectiveness of their use is limited. The WHO guide regarding the use of corticosteroids in patients with COVID-19 only recommends the use of corticosteroids in critically ill patients.

The use of hydroxychloroquine and chloroquine was also proposed, which interfered with the fusion of the SARS-CoV-2 virus with the cell membrane, the glycosylation of receptors, and with the increase in vesicular pH. Until now, all the studies published on hydroxychloroquine, with or without azithromycin, do not indicate that it has antiviral efficacy, that it improves the clinical evolution of patients or mortality. Given the lack of evidence of efficacy and the potential safety risks identified, the use of hydroxychloroquine is

currently not recommended.[7] Although COVID-19 is a viral infection and, therefore, is not treated or prevented with antibiotics, the diagnosis of bacterial coinfection or superinfection in these patients often leads to the prescription of antibiotic treatment. In these cases, the indicated antibiotic treatment must be used according to the usual recommendations for adults and the resistance pattern of each center.[7]

Another treatment used has been convalescent plasma, as this provides passive antibody-based immunity and thus could reduce the duration or severity of illness in patients with infection who have had a suboptimal immune response. It may be of special interest for people with deficiencies in the production of antibodies, it is obtained from people who have recovered from COVID-19. Evidence on efficacy is limited; suggests better results in people hospitalized with severe COVID-19 if convalescent plasma is administered early in the course of the disease.[7] Bronchodilators should be given whenever indicated but should not be ordered as standard treatment. Nebulizers are associated with aerosolization, which increases the risk of SARS-CoV-2 transmission, and should be avoided, especially in cases without evidence-based benefit. Pulmonary vasodilators may be especially useful for patients with acute or decompensated pulmonary arterial hypertension. However, these agents do not reduce mortality in ARDS and should not be used in place of proven therapies as there is no evidence to support the use of pulmonary vasodilators in patients with COVID-19.[14]

Venous thromboembolism (VTE) and, in particular, pulmonary embolism (PE) have emerged as a significant risk associated with severe SARS-CoV-2 infection. For this reason, the current recommendation is to apply a universal thromboprophylactic pharmacological strategy to all hospitalized patients. The preferred agent is low molecular weight heparin (LMWH).[14] In COVID-19, acute hypoxemic respiratory failure is one of the most common clinical manifestations that determine the clinical outcome in patients. Meta-analyses have recently shown that high-flow nasal cannula (HFNC) reduces the rate of intubation compared to conventional oxygen therapy, but also compared to non-invasive positive pressure ventilation (NIPPV) in acute hypoxemic respiratory failure. Based on this evidence, the European Society for Intensive Care Medicine (ESICM) recommends its use in patients with COVID-19; however, there is a strong recommendation for close monitoring for signs of deteriorating respiratory status and early intubation in a controlled setting, when applying HFNC/NIPPV in patients with COVID-1914. Different treatments are currently being described and studied, there is still no protocol for the management of COVID-19, none of these treatments should be prescribed without medical supervision or on an outpatient basis since there is little information.[15]

Symptoms and clinical manifestations after SARS-CoV-2 / COVID-19 infection have appeared in many survivors and are similar to those of fatigue after Severe Acute Respiratory Syndrome (SARS). Approximately 90% of recovered people present a wide range of symptoms and conditions that vary from a mild manifestation such as headache to more critical diseases such as stroke, renal failure, myocarditis, arrhythmias, and pulmonary fibrosis. The most reported symptoms are fatigue, anxiety, joint pain, continuous headache, chest pain, dementia, depression, and dyspnea4. The recovery time of this disease and the reasons why the sequelae it leaves vary so much between patients are still unknown. The diversity of persistent symptoms among survivors of SARS-CoV-2/COVID-19 infection occurs not only among hospitalized and critically ill patients but is unfortunately also reported in non-hospitalized, asymptomatic, or post-infected patients. by SARS-CoV-2 / mild COVID-19.[4] Also, these prolonged symptoms were significantly associated with age 40 to 60 years, hospital admission, and abnormal auscultation at symptom onset. Severe COVID-19 and/or dyspnea at symptom onset were additional factors associated with persistent symptoms.[5]

Descriptive studies during the first wave of the pandemic in 2020 indicated that at least 10-20% of subjects had not fully recovered after three weeks.[3] Between 1% and 3% continue to experience significant discomfort after 12 weeks.[6] There is no universally agreed definition of the post-acute period of COVID-19. Some authors suggest that the subacute period begins three weeks after the onset of symptoms, since the average duration of positivity in the polymerase chain reaction (PCR) technique in symptomatic subjects has been estimated at 24 days. In hospitalized subjects, it has been proposed that the post-acute period begins at the time of hospital discharge.[3] The United Kingdom's National Institute for Health and Care Excellence (NICE) in its guidance on the long-term consequences of COVID-19 differentiates between acute COVID-19, where signs and symptoms last up to four weeks, COVID-19 19 ongoing symptomatic, here the signs and symptoms last four to 12 weeks and expose the post-COVID-19 syndrome. The NICE guide defines the post-COVID-19 syndrome as the set of signs and symptoms that develop during or after an infection compatible with COVID-19 (a previous history of COVID-19 confirmed by PCR is not necessary for its diagnosis), continue for more than 12 weeks, and are not explained by an alternative diagnosis. Symptoms can often overlap, fluctuate and change over time, sometimes in flare-ups.

The NICE guide describes post-COVID-19 symptoms, which can be found either within the respiratory system, such as cough and dyspnea, or at the cardiovascular level, when oppression, chest pain, and palpitations are found. Neurological symptoms include headache, dizziness, tinnitus, loss of taste and/or smell, sleep disorders, paresthesias, muscle pain, cognitive symptoms such as 'brain fog', memory problems, concentration problems, symptoms psychiatric disorders such as anxiety and depression. Gastrointestinal symptoms include abdominal pain, nausea, diarrhea, and anorexia; finally, we find systemic symptoms, fatigue, fever, pain, arthralgia, earache, and sore throat.[3]

The United States Center for Disease Control and Prevention uses the term 'post-COVID conditions' to describe any health disorder or alteration that persists for more than four weeks after SARS-CoV-2 infection, and distinguishes three subtypes: a) Persistent COVID, which is defined as a series of symptoms that appear combined in different proportions, that last for weeks or months, and can also affect people who suffered from mild COVID or who were even asymptomatic. The main symptoms are fatigue, difficulty thinking or concentrating, headache, loss of taste or smell, dizziness when standing, palpitations, shortness of breath, cough, muscle or joint pain, anxiety and/or depression, fever, and worsening symptoms. after performing physical or mental activities; b) Symptoms resulting from damage to multiple organs, such as the heart, lung, kidney, skin, and nervous system. This category also includes the so-called multisystem inflammatory syndrome and other autoimmune entities, and c) Consequences of COVID-19 treatment or prolonged hospitalization, which includes post-intensive care unit (post-ICU) or critical patient syndrome, and in which a high percentage of patients have severe muscle weakness and fatigue, critically ill polyneuropathy, cognitive disturbances (affecting sustained and divided attention, short-term memory, executive functions, and slow processing of information), and symptoms of post-traumatic stress, pain, anxiety, and depression.[3] The skin and the nervous system. This category also includes the so-called multisystem inflammatory syndrome and other autoimmune entities, and c) Consequences of COVID-19 treatment or prolonged

hospitalization, which includes post-intensive care unit (post-ICU) or critical patient syndrome, and in which a high percentage of patients have severe muscle weakness and fatigue, critically ill polyneuropathy, cognitive disturbances (affecting sustained and divided attention, short-term memory, executive functions, and slow processing of information), and symptoms of post-traumatic stress, pain, anxiety, and depression.[3] the skin and the nervous system. This category also includes the so-called multisystem inflammatory syndrome and other autoimmune entities, and c) Consequences of COVID-19 treatment or prolonged hospitalization, which includes post-intensive care unit (post-ICU) or critical patient syndrome, and in which a high percentage of patients have severe muscle weakness and fatigue, critically ill polyneuropathy, cognitive disturbances (affecting sustained and divided attention, short-term memory, executive functions, and slow processing of information), and symptoms of post-traumatic stress, pain, anxiety, and depression.[3]

The post-COVID-19 syndrome has the characteristic that its symptoms cause a disability, which is why it generates a great impact on the individual, the care, and rehabilitation units. All these alterations have an impact on the functional capacity of these patients, with reduced quality of life and return to work (only 40% 2-3 months after the acute episode have returned to work). Taking this into account, early rehabilitation, from hospital admission and especially in the most severe patients admitted to the ICU, can reduce sequelae in these patients.[15,16]

Rehabilitation must be done individually, taking into account the needs of each patient and their comorbidities, it must be as complete as possible. This comprehensive assessment must be linked to information on the acute phase of the disease (signs and symptoms experienced during the hospital stay) and can serve to redefine the organizational model of care and plan what is necessary for the medium and long term. Therefore, it is of the utmost importance that health services be established to guarantee a comprehensive follow-up of people discharged from the hospital and the emergency department.[8] To guarantee a good rehabilitation process, it is necessary to define protocols and clinical pathways of action that ensure coordination between specialties and the different levels of care, including the health and social spheres. A case manager should be established to ensure the adequate appointment of the patient in the appropriate consultation and ensure the necessary exchange of information with Primary Care and the different specialties that assist the patient.[16]

Case report

This is a 57-year-old female patient with a history of hypothyroidism, fibromyalgia, neck pain, osteoarthritis, osteopenia, and chronic and mechanical lumbago secondary to grade III obesity. Who received the first dose of the Pfizer vaccine against COVID-19 on June 02, 2021. The patient, starting on June 06, 2021, began with a clinical picture consisting of asthenia, adynamia, anosmia, ageusia, headache, myarthralgia, nausea, cough, chest and lumbar pain, for which the PCR test for SARS-CoV-2 was performed on June 8, 2021, which was positive, the patient received medications prescribed by a private doctor (azithromycin and ivermectin, dose unknown), his condition worsened at home.

Upon admission to the emergency department, the following paraclinical tests were requested: D-dimer 389 ng/ml, troponin 12.3 ng/mL, C-reactive protein 93.68, creatinine 1.02 mg/dl, BUN 21.9 mg/dl, lactic acid 3.14 mg/dL, LDH 314 U/L, potassium 5.12 mmol/L, sodium 139 mmol/L, arterial gases: pH 7.41, PCO2 34 mmHg, PO2 73 mmHg, HCO3 22 mEq/L, FIO2 28 mmHg, PAFI 261 mmHg, complete blood count with leukocytes 14,570 x10^3/uL, neutrophils 89.3%, lymphocytes 5.2%, hemoglobin 13.7 g/dl, platelets 332 x10^3/uL, negative influenza antigen, chest x-ray with bilateral parahilar infiltrates with a tendency to consolidation, according to the findings clinical and paraclinical, the patient had a mild-moderate risk, with NEWS Score scales 5 points (medium risk), PSI/PORT: 47 points - risk class II with 0.6-0.9% mortality, Call score: 9 points,class B, MuLBSTA: 9 points with 7.03% mortality at 90 days, CURB 65: 1 point, low risk with 2.7% mortality.

According to the above, they conclude SARS-CoV-2 infection plus bacterial pneumonia, for which she is transferred to a hospital ward and management begins on June 16, 2021, with ampicillin sulbactam 3 g intravenously every 6 hours, clarithromycin 500 mg 1 intravenous ampoule every 12 hours, dexamethasone 6 mg intravenous every 24 hours, omeprazole tablet 20 mg every 24 hours, enoxaparin 80 mg subcutaneous every 24 hours, dipyrone 1 g ampoule intravenously every 8 hours, acetaminophen 1 g orally every 8 hours, levothyroxine tablet 25 cmg every 24 hours, on physical examination he presented high blood pressure figures, so he was started on losartan tablet 50 mg every 24 hours.

However, on the same day, June 16, the patient presented a greater deterioration in her respiratory pattern, requiring a high-flow cannula. It was necessary to transfer her to the ICU where she required invasive mechanical ventilation and low-dose vasopressor support. On June 18, they take an orotracheal tube (OTS) culture, and on June 21, they report positive for Klebsiella pneumoniae, they also perform blood cultures with a negative report, the patient presents fever spikes, without a systemic inflammatory response, and they perform procalcitonin with a negative report. On June 23, they report a new TOS culture which continues to be positive for Klebsiella pneumoniae, his last fever peak was reported and respiratory therapy reported output of scant mucoid secretions, considering gradually decreasing ventilatory parameters to suspend sedation and start the extubation process. New paraclinical tests were obtained on June 24 without leukocytosis or neutrophilia, hemoglobin 10 g/dl, platelets 347 x10^3/uL, C-reactive protein 77.[2]

On June 25, the patient was more stable without vasoactive support, the ampicillin sulbactam regimen ended and her evolution was towards clinical improvement. Given the time of evolution after the onset of symptoms, the isolation was suspended. On June 27, the patient presented clinical deterioration, with RASS -1, coupled to ventilatory support with peripheral saturations at borderline values, ranges that fluctuated between 75-85%; Coupling in other modes of ventilatory support was attempted, but no improvement was obtained, sedation was increased without improvement, saturation continued to deteriorate, requiring FiO2 at 100% without improvement, so a pronation session was decided.

Before starting the pronation session, an orotracheal tube with abundant mucus was observed, occluding the lumen of the orotracheal tube, so a laryngoscopy was performed and an orotracheal tube was changed. No improvement was obtained; therefore, a pulmonary ultrasound was performed at the point of care. which showed signs of spontaneous right pneumothorax of 50%, the patient began hemodynamic deterioration, being on the verge of initiating cardiac arrest, but intravenous adrenaline was administered, managing to recover blood pressure. It was confirmed later with a quickly performed chest X-ray, drainage was attempted with a single puncture in the second right intercostal space, midclavicular line, but no improvement was obtained, so an urgent right thoracostomy was required.

After his slow and progressive improvement in peripheral oximetry, he temporarily required norepinephrine. Paraclinical tests were

requested, which reported PaFiO2 76.8, compensated hypercapnic acidemia, and BUN of 32 mg/dl. On June 28, SOT documented a superinfection by Pseudomonas Aeruginosa, so management with cefepime began. On June 29, the patient is still in critical condition, maintaining hemodynamic stability with good global perfusion, invasive ventilatory support, intermediate ventilatory parameters, with a prone/supination protocol due to severe hypoxemia. They perform control ultrasounds with which they observe the resolution of the right pneumothorax.

On July 1, due to persistence of hypoxemia, the second cycle of prone position was indicated with adequate partial response, he required norepinephrine at relatively low doses due to drug vasodilation, he did not present any signs of the systemic inflammatory response, but relative adrenal insufficiency was not ruled out and steroids were started at a dose of shock. Subsequently, on July 3, the patient maintains hemodynamic and ventilatory stability, without cardiovascular support, but still with minimal ventilatory support, with oximetry targets. It was decided to start the gradual withdrawal of sedatives to favor spontaneous modes of mechanical ventilation. Muscular and diaphragmatic rehabilitation began on July 5, seeking to lead to scheduled extubation. At the time, the patient was receiving ventilatory support alternating spontaneous modes.

On July 6, the patient presented adequate metabolic control, without the presence of fever spikes, with mechanical ventilation with pressure support with adequate tolerance. In the afternoon, the patient tolerated extubation with non-invasive mechanical ventilation, with a conventional nasal cannula, and had preserved renal function, and mild hypernatremia. She continued in the ICU with a ventilator at the bedside because she had not yet completed 24 hours post-extubation, due to the risk of ventilatory failure. On July 9, she received paraclinical tests with potassium at 4 mmol/L and sodium 155 mmol/L, and she decided to transfer to the hospital.

By July 10, hypernatremia persisted, so intravenous isotonic fluids (SSN 0.45%) are indicated and water intake was promoted. His prognosis improved according to his evolution. On July 11, already in the hospital, hypoactive delirium secondary to metabolic disorder was considered; sleep disorder and insomnia. Therefore, treatment was started with quetiapine 25 mg orally every 24 hours. They request a complete blood count, which reports leukocytes 7490 x10^3/uL, neutrophils 56%, hemoglobin 10.2 g/dl, hematocrit 32%, platelets 578,000 x10^3/uL, BUN 58.8 mg/dl, potassium 4.19 mmol/L, sodium 151 mmol/L, CRP 8, creatinine 1.51 mg/dl.

After this, psychiatry evaluated her on July 12 and determined that the patient had a predominantly multifactorial hyperactive mixed delirium, since the patient was disoriented, with an altered sleep pattern, with disorganized thinking, possibly due to metabolic disorder, since he had hydroelectrolytic alterations due to hypernatremia and compensated alkalosis without criteria for dialysis urgency. This is how they request sodium control to define discharge, which reported sodium of 144 mmol/L, creatine phosphokinase 69 U/L. On July 13, the patient continues her process of dismantling oxygen support. She had delirium in modulation and elevated nitrogen levels, however, in decline, for which they request arterial gases to rule out an acid-base disorder.

On July 14, reports of requested arterial gases arrive that showed respiratory alkalosis. On physical examination, the patient presented severe physical deconditioning, however, with good rehabilitation potential, so they decided to request homecare to continue the rehabilitation with oxygen support, daily visits by a general practitioner, physiotherapy, respiratory, and occupational therapy. Then, on July 15, a patient was seen in acceptable general conditions, with support even by nasal cannula, on physical examination with attenuated vesicular murmur with rales in decline. At that time, it was decided to discharge omeprazole 20 mg every 24 hours orally, losartan 50 mg every day, carvedilol 6.25 mg every 12 hours orally, levothyroxine 50 ug every 24 hours orally, bisacodyl 5 mg every 24 hours oral, quetiapine 25 mg every 24 hours orally at 9:00 pm and with the order to start hospital day, on July 19, 2021.

On July 19, during homecare follow-up with internal medicine and general medicine, the patient persists with the nasal cannula at 1 L, tolerating intervals without oxygen and showing improvement in dyspnea, it is indicated to reduce the dose of quetiapine for one week and if there is the improvement or continues stable, it is indicated to suspend. Since the patient presented marked deconditioning and in permanent stationary positions in the supine or sitting position, anticoagulation with enoxaparin 40 mg every 24 hours for 30 days was indicated. A transthoracic echocardiogram was requested for suspected chronic heart disease, to assess ventricular function and rule out contractility disorders, a lumbosacral spine x-ray for chronic lumbago and to rule out a mechanical component, Doppler ultrasound of the venous vessels of the lower limbs for suspected deep venous insufficiency requiring surgical intervention. , since the patient reported pain in both lower limbs at the level of the sural region, an additional SOD rhythm or surface electrocardiogram and chest X-ray were requested to evaluate the persistence of the right pneumothorax.

The patient underwent a rhythm or SOD surface electrocardiogram on July 23, which reported an inverted T wave in DI, DII, AVL, V4,5,6, data of subepicardial ischemia with similar findings in the previous electrocardiogram, so Probable old coronary event or dilated heart disease is considered. The internist asks for a repeat electrocardiogram since it impresses lead reversal due to having positive T waves in AVR. Subsequently, a Doppler ultrasound of the venous vessels of the lower limbs was performed on July 26 with a negative result for deep and/or superficial vein thrombosis and telangiectasias in the leg and thigh. On July 28, an X-ray of the lumbosacral spine was taken, with an image within normal limits, and on July 30, a transthoracic echocardiogram was performed, which concluded that the left ventricle was not dilated with the concentric remodeling of its walls and preserved global systolic function. With ejection fraction of 61%, preserved diastolic function and mitral valve sclerosis with trivial insufficiency.

On August 03, a control AP and lateral decubitus chest X-ray was performed, which shows distended lung parenchyma, with the presence of a diffuse interstitial pattern, both central and peripheral, predominantly right, associated with fibrotic tracts, free costophrenic angles and no evidence of pleural effusions. Paraclinical control tests had been requested, which were performed on July 30, with an ultrasensitive TSH 7.79 uUl/ml, complete blood count with total leukocyte count 5.84 x10^3/uL, neutrophils 3.33%, hemoglobin 10.3 g/dl, hematocrit 33.0 %, platelet count 311 x10^3/uL, D-dimer 820.37 ng/mL, quantitative troponin I 1.5 ng/L, chloride 105.7 mmol/L, serum potassium 4.26 mmol/L, serum sodium 141 mmol/L, total creatine phosphokinase 33 U/L, serum creatinine 0.95 mg/dl, BUN 14.8 mg/dl, ALT 14.9 U/L, AST 12.7 U/L, and C-reactive protein 4.96.

On August 12, she is visited at home by general medicine, the physical examination is carried out on the Barthel scale, which scores 75/100 with slight dependence on third parties, unlike when she left the clinic with a Barthel of 10/100. She still had decreased muscle strength in her right lower limb, with paresthesias, for which electromyography and bilateral neuroconduction were requested.

Citation: Rebolledo- Cifuentes DI, Rúa- Bañol MF, Agudelo PAM. Post-COVID-19 Syndrome - case report. *Int J Fam Commun Med.* 2022;6(4):156–163. DOI: 10.15406/ijfcm.2022.06.00282

The paraclinical tests requested and described above are reviewed and ferrous sulfate 300 mg tablets are added to his medical treatment every day for 3 months due to low-volume anemia. Levothyroxine was adjusted to 50 mg tablets for 5 days a week and 75 mg 2 days a week since TSH was outside normal limits. A requested electrodiagnostic study was performed on September 30, which reported the following findings: motor neuroconduction of the bilateral peroneal and tibial nerve, with decreased amplitude of the right peroneal nerve, absence of left peroneal potential, sensory neuroconduction of the superficial peroneal nerve without recording waveform on the right side, electromyography showing abnormal insertional activity, signs of membrane instability, abnormal motor unit morphology, normal recruitment, and interference pattern, this study abnormal, electrophysiological evidence of bilateral peroneal neuropathy, with partial axonal injury on the right side at leg level with signs of active denervation. On October 25, 2021, he had a new control by general medicine, which decided to continue with the same pharmacological management established previously.

After the last medical visit, the patient underwent a private assessment by a specialist in physical medicine and rehabilitation on October 28, who found a patient with a gait and a tendency to drop foot, predominantly right, bilateral dorsiflexor strength of the foot 4/5, extension of the right hallux 1/5, extensor left hallux 3/5, gait without dragging with a tendency to hallux ptosis, hypoaesthesia in the bilateral superficial peroneal territory with complete anesthesia in the bilateral deep peroneal territory. The patient is taken to decubitus with neck extension triggering vertigo in the vestibular test maneuver with nystagmus; Due to the above, benign paroxysmal postural vertigo (Post-Covid) was diagnosed. Currently, November 26, the patient persists with the following symptoms: dizziness, tinnitus, loss of balance, memory and concentration, adynamia, tiredness, loss of strength in feet and legs, burning pain, predominantly in the lower limb right, dyspnea on moderate exertion, chest tightness, hyposmia and hair loss. She reports that the pain in her legs makes her unable to perform the tasks that she usually did before presenting with COVID-19. Until now, the patient has not been able to return to her usual daily tasks, but her condition does not limit her self-care. remains incapable of work.

Discussion

"Prolonged COVID" is a complex, multifactorial disease that describes the residual effects of acute COVID-19 infection. While thousands of patients experienced "mild" COVID-19 symptoms that did not require hospital admission, a large proportion collectively suffer from post-COVID-19 sequelae. These symptoms were not commonly recognized within the formulation of health policies during the beginning of the pandemic, but they have emerged as tremendous challenges for doctors and the health system17. From the pathophysiological and etiological point of view, there are multiple theories that could describe the reason for the Post-Covid syndrome:

I. The persistence of the virus in the body, causing a latent or chronic infection.

II. Cytokine storm which is associated with the severity of the disease and the persistence of symptoms since this alteration in recovered patients reflects chronic inflammation and ongoing angiogenesis.

III. The existence of antibodies in COVID-19 that can act against immunomodulatory proteins, disrupting immune function. They impair virologic control by inhibiting neuroreceptor signaling and by altering the composition of peripheral immune cells. All this could contribute to the immunopathology of COVID-19, aggravating its symptoms or maintaining them19.

The "post-COVID-19 syndrome" is defined as the persistence of symptoms beyond 12 weeks from the date of onset17. This is how the patient in the case presented after her discharge on July 15, 2021 due to infection confirmed by SARS-CoV-2 PCR has persisted with symptoms secondary to infection for up to 19 weeks after discharge from the hospital.

As described above, the NICE guide defines post-COVID-19 symptoms, of which the patient presented in this case meets the following: fatigue, pain, arthralgia, dyspnea on medium exertion, chest tightness, dizziness, tinnitus, hyposmia, paresthesia, muscle pain, memory, and concentration problems. Associated with other symptoms such as loss of balance, hair loss, and loss of strength that are identified in other bibliographies as part of the post-COVID-19 syndrome. Thus, this patient is part of the 10-20% of the subjects who do not fully recover after 3 weeks. Taking into account the evolution of the hospitalized patient and the measures that had to be implemented for her recovery, it can be related to studies carried out where it is commented that the majority of patients who required hospitalization report persistent symptoms over time. According to studies, the prevalence of post-COVID-19 symptoms was higher in patients admitted to the ICU compared to those on the ward: fatigue (72% vs. 60.3%), dyspnea (65.6% vs. 42.6%), post-traumatic stress (46.9% vs. 23.5%), attention and memory disorders (52% vs. 33.8%), and swallowing and language disorders (68.7% vs. 42, 6%)3. The foregoing supports the sequelae that the patient has presented, some symptoms being more outstanding than others, the patient emphasizes dyspnea, pain,

Up to 80% of ICU patients surviving acute respiratory failure after receiving mechanical ventilation are reported to report worsening physical, cognitive, and/or mental health impairments that persist beyond discharge. It is called post-intensive care syndrome (PICS). COVID-19 patients admitted to the ICU may have additional long-term effects on top of those due to viral infection alone. Post-intensive care syndrome includes deterioration of physical, cognitive and/or mental health that persists after discharge. Several factors contribute to these impairments, including sedatives, neuromuscular blocking drugs, immobility, mechanical ventilation, as well as reduced human interaction and reduced access to rehabilitation services. Physical impairments, including joint contractures, significant muscle wasting and weakness, and limitations in physical functioning, can last for months or years.[18]

The patient in question throughout her hospital care was exposed to all the factors mentioned above, two cycles of the prone position, prolonged orotracheal intubation for 21 days, delirium, right pneumothorax with thoracostomy, bacterial superinfection by two agents, cardiac arrest, sedatives, neuromuscular blocking drugs, immobility, reduced human interaction, and reduced access to rehabilitation services. Taking into account the above, the patient could be suffering from post-intensive syndrome and post-COVID-19 syndrome, since her in-hospital and out-patient clinical history shows clinical and paraclinical findings compatible with these syndromes. According to the clinical and radiological findings, the patient had bacterial pneumonia, for which she could present respiratory sequelae or develop pulmonary fibrosis after the infection; After hospital discharge, the patient presented dyspnea on moderate exertion. In post-COVID-19 patients with no history of lung disease, they may present opacities, as in the case of the patient who has a control chest X-ray showing distended lung parenchyma, with the presence of a predominantly central and peripheral diffuse interstitial pattern

right, associated with fibrotic tracts; this can generally correspond to organizing pneumonia or inflammatory lesions. The foregoing is correlated with studies where it has been found that, 6 months after the onset of symptoms, patients with the more severe disease during their hospital stay had increasingly impaired pulmonary diffusion capabilities and abnormal chest imaging manifestations4, such as the case of the patient who still manifest respiratory symptoms. Hence the importance of having an interdisciplinary group when it comes to the rehabilitation of these post-COVID-19 patients.

The post-COVID-19 patient may present neurological complications, including neuropathy in patients with severe respiratory infection and stay in the ICU, which can range from polyneuropathy with predominantly axonal involvement with sensory-motor involvement to Guillain-Barré syndrome. or other complications, occurring in up to 40% of patients admitted to the ICU. This virus has a binding affinity to the human receptor angiotensin-converting enzyme 2 (ACE2) and the expression of ACE2 receptors probably explains the involvement of spinal structures by SARS-CoV-2 / COVID-19 infection as well as in the rest of the nervous system where with the action of IL-1, IL-6 and TNF alpha cytokine response generate polyneuropathy that is also related to immobility and other conditions typical of the critical period of the disease4. The foregoing, plus the two cycles of prone as a risk factor, would explain why the patient in the exposed case persists with symptoms of loss of strength, paresthesias, pain, hypoesthesia, anesthesia, and foot drop, compatible with studies in which she was diagnosed with a Bilateral severe right and moderate left partial peroneal nerve injury with signs of reinnervation (Post-Covid neuropathy), which response to analgesics and the use of neuromodulators. So far there are no protocols for the rehabilitation of post-COVID-19 patient polyneuropathy, but interdisciplinary management with physiotherapy, occupational therapy, and psychology since improves the functionality of the patient. Another long-term risk of ICU admission is delirium, which is a state of confused thinking that can lead to long-term cognitive decline. This can be caused by the virus targeting the brain and/or sedatives prescribed to reduce coughing and the discomfort of a breathing tube18. In this sense, the patient during her hospitalization presented delirium and currently persists with neurological symptoms given by paroxysmal vertigo, loss of memory, and concentration. This can be caused by the virus targeting the brain and/or sedatives prescribed to reduce coughing and the discomfort of a breathing tube18. In this sense, the patient during her hospitalization presented delirium and currently persists with neurological symptoms given by paroxysmal vertigo, loss of memory, and concentration. This can be caused by the virus targeting the brain and/or sedatives prescribed to reduce coughing and the discomfort of a breathing tube18. In this sense, the patient during her hospitalization presented delirium and currently persists with neurological symptoms given by paroxysmal vertigo, loss of memory and concentration.

At the time of discharge, a third of patients with COVID-19 have cognitive impairment and motor deficits. The pronounced systemic inflammation apparent in SARS-CoV-2 infection, and the fact that systemic inflammation promotes cognitive decline and neurodegenerative disease, suggests that COVID-19 survivors will likely experience long-term neurodegeneration. Furthermore, chronic ventilation is highly associated with persistent cognitive impairment, executive dysfunction, and reduced quality of life. However, longitudinal follow-up studies are required to determine the long-term neurological consequences of SARS-CoV-2 infection and to understand its neuroinvasion properties. Patients with Post-Covid syndrome have been the subject of several investigations that have allowed us to fully understand the long-term consequences and multi-systemic factors of this virus; likewise, necessary interventions to provide comprehensive management to the patient, since a large part of the population with this syndrome is affected, compromising their physical, mental, and social function.[19]

The patient in the clinical case was evaluated with the post-COVID-19 functional status scale, which was developed by Klok, for the follow-up of patients after COVID-19 infection. This scale observes relevant aspects of daily life, in order to look for evidence of functional limitations in patients with COVID-19 infection. The scale evaluates aspects such as: survival, constant care, basic activities of daily living, instrumental activities of daily living, participation in habitual social roles and finally it is evaluated with a symptom checklist. The foregoing is in order to objectively focus on the functional and respiratory rehabilitation of the patient. The scale was applied to the patient who was classified in grade 3, with moderate functional limitations, In the same context of functional dependence, the patient was stratified in her level of independence or limitations by applying the Barthel index, giving a result of 85/100, which classifies her as dependent-moderate, with a history of a Barthel index of 10. /100 at the time of hospital discharge, which shows a tendency to improve, but still without fully recovering its functionality. In the context of the impact of mental health, emotional stress must be taken into account since it brings neurobiological consequences that are capable of increasing the probability of exacerbating concomitant diseases. Likewise, exaggerated concern for health can occur with different intensities, with generally erroneous and catastrophic interpretations of bodily sensations.[20]

In addition to the health problems caused by the disease and the fears that this raises, interpersonal relationships have changed drastically since confinement21. Thus, in the case cited, the patient presents social limitation due to the fear of being reinfected, the anxiety for a speedy recovery, the prolongation of her convalescence and the lack of independence causing negative thoughts. Finally, for the case presented, it is important to consider the history and clinical conditions prior to the SARS-CoV-2 infection, such as hypothyroidism, fibromyalgia, osteoarthritis, and grade III obesity, since they may correlate with the intensity and duration of the symptoms. post-COVID-19 with which the patient persists.

Conclusion

In the literature, there is much talk about the post-COVID-19 syndrome, but much remains to be discovered about the virus and its consequences at the systemic level. It is necessary to individualize acute and chronic treatments, based on the success of clinical studies, a syndromic and comprehensive multidisciplinary approach to determine the most appropriate therapeutic options for patients. Within the approach to the post-COVID-19 syndrome, it is important to consider the history or clinical conditions prior to the SARS-CoV-2 infection, since to a large extent they can condition not only the acute evolution but also the presentation, severity, and duration of the symptoms. aftermath. As for post-COVID-19 symptoms, it is known that these can manifest themselves at a general level, and specifically in the respiratory, cardiovascular, neurological and gastrointestinal systems, generating sequelae at different levels that affect the physical, mental and social functionality of the patients; This is how the post-COVID-19 patient must have early, individual rehabilitation and with the assistance of different health professionals in specialties such as neurology, neurology, physiatry, cardiology, internal medicine, family medicine, psychiatry, psychology, work social therapy, physiotherapy, occupational therapy, respiratory therapy, among others,

One of the great challenges identified in the midst of the pandemic is the need to strengthen the responsibilities, capacities, and articulation

of the different actors in the health system, to ensure true integration and coordination between the different levels of care and the functions of insurance and care. accompaniment by government entities focused on primary health care interventions, primary, secondary and tertiary prevention, risk management and impact on the social determinants of the disease. The importance of identifying and documenting case reports or case series or research works that allow expanding knowledge not only in the scientific community but also in a general way, in health systems, in the community and in public opinion, of so that, on the one hand, there are more effective clinical interventions and, on the other hand, there is sensitivity and appropriation of the problem of the post-COVID-19 syndrome at the different levels of society.

Acknowledgements

This research has been funded by General Directorate of Research of Universidad Santiago de Cali under call No. 01-2022.

Conflicts of interest

The author declares there is no conflict of interest.

References

1. Zhu N, Zhang D, Wang W, et al. A Novel Coronavirus from Patients with Pneumonia in China. *N ENGL J MED*. 2020;382;8.
2. Carod Artal FJ. Neurological complications due to coronavirus and COVID-19. *Rev Neurol*. 2020;70:311–22.
3. Carod- Artal FJ. Post-COVID-19 syndrome: epidemiology, diagnostic criteria and pathogenic mechanisms involved. *Rev Neurol*. 2021; 72:384–96.
4. Trujillo C. Section IX. Post COVID-19 syndrome: late complications and rehabilitation. *Infectio*. 2021;25(4):290–344.
5. Carvalho-Schneider C. Follow-up of adults with noncritical COVID-19 two months after symptom onset. *Clinical Microbiology and Infection*. 2021;258–263.
6. Ladds E, Rushforth A, Wieringa S, et al. Persistent symptoms after Covid-19: qualitative study of 114 "long Covid" patients and draft quality principles for services. *BMC Health Serv Res*. 2020;20(1):1144.
7. Rain MN, Jimenez MC. Current status of treatments for COVID-19. *FMC*. 2021;28(1):40–56.
8. Gemelli Against COVID-19 Post-Acute Care Study Group. Post-COVID-19 global health strategies: the need for an interdisciplinary approach. *Aging Clin Exp Res*. 2020;32(8):1613–1620.
9. Morales Fernandez JA, Wong Chew RM. Generalities, clinical and prevention aspects of COVID-19: Mexico and Latin America. *Univ Med*. 2021;62(3).
10. Ahmad T, Haroon, Dhama K, et al. Biosafety and biosecurity approaches to restrain/contain and counter SARS-CoV-2/COVID-19 pandemic: a rapid-review. *Turk J Biol*. 2020;44(3):132–145.
11. Chih-Cheng L, I Tzu C, Chien-Ming C, et al. COVID-19 vaccines: concerns beyond protective efficacy and safety. *Expert Review of Vaccines*. 2021;8:1013–1025.
12. *Epidemiological Update: Coronavirus disease (COVID-19).* October 30, 2021. Pan American Health Organization / World Health Organization. Washington, DC: PAHO/WHO; 2021.
13. Gonzalez Rodriguez P, Perez-Moneo AB. COVID-19: Critical appraisal of the evidence. *An Pediatr (Engl Ed)*. 2021;95(3):207.e1–207.e13.
14. Gavriatopoulou M, Ntanasis-Stathopoulos I, Korompoki E, et al. Emerging treatment strategies for COVID-19 infection. *Clin Exp Med*. 2021;21(2):167–179.
15. *COVID-19 rapid guideline: managing the long-term effects of COVID-19 - The National Institute for Health and Care Excellence (NICE).* 2021.
16. Bouza E, Canton R, From Lucas Ramos P, et al. Post-COVID syndrome: A reflection and opinion paper. *Rev Esp Quimioter*. 2021;34(4):269–279.
17. Taribagil P, Creer D, Tahir H. 'Long COVID' syndrome. *BMJ Case Rep*. 2021;14(4):e241485.
18. Higgins V, Sohaei D, Diamandis EP, et al. COVID-19: from acute to chronic disease? Potential long-term health consequences. *Critical Reviews in Clinical Laboratory Sciences*. 2021;58:5(5):297–310.
19. Spanish Society of General and Family Physicians. *Clinical Guide for Long Covid/Persistent Covid Patient Care*. Version 1.0. 2021.
20. Larios-Navarro A, Bohorquez-Rivero J, Naranjo-Bohórquez J, et al. Psychological impact of social isolation in the comorbid patient: regarding the COVID-19 pandemic. *Colombian Journal of Psychiatry*. 2020;49(4):227.
21. Pinazo-Hernandis S. Psychosocial impact of COVID-19 on the elderly: problems and challenges. *Spanish Journal of Geriatrics and Gerontology*. 2020;55(5):249.