

Is Poliomyelitis Sequelae A Disadvantage for Recovery from Covid-19 ARDS: A Case Report

Mahir TOPALOĞLU¹, Zeynep TURAN¹, Suda TEKİN², Evren ŞENTÜRK³, Özden ÖZYEMİŞÇİ TAŞKIRAN¹

¹Koç University Hospital, Department of Physical Medicine and Rehabilitation, İstanbul, Turkey

²Koç University Hospital, Department of Infectious Diseases, İstanbul, Turkey

³Koç University Hospital, Department of Anesthesiology and Intensive Care, İstanbul, Turkey

ABSTRACT

We present a case with acute respiratory distress syndrome due to COVID-19 who had poliomyelitis sequelae. He was hospitalized in the intensive care unit and supported by non-invasive mechanical ventilation for 7 days. IL-6 inhibitor was administered due to cytokine storm. No steroid or sedative agents were administered. Early mobilization was performed in the intensive care unit. One month after discharge, physical examination revealed COVID-19 infection did not

cause significant changes in muscle strength and physical performance in this patient with poliomyelitis sequelae. It is important to promote early mobilization in the intensive care unit to prevent post-intensive care syndrome in COVID-19 acute respiratory distress syndrome.

Keywords: COVID-19, poliomyelitis, muscular weakness, intensive care unit, acute respiratory distress syndrome

Cite this article as: Topaloğlu M, Turan Z, Tekin S, Şentürk E, Özyemişçi Taşkıran Ö. Is Poliomyelitis Sequelae A Disadvantage for Recovery from Covid-19 ARDS: A Case Report. Arch Neuropsychiatry 2022;59:158-160.

INTRODUCTION

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), might lead to life-threatening acute respiratory distress requiring intensive care unit (ICU) admission (1). There is a high risk for long-term muscle weakness, loss of muscle mass, and reduced quality of life which is reported in coronavirus survivors discharged from ICU (2). Muscular weakness was confirmed in 66% of patients with ICU admission due to COVID-19 pneumonia (3).

Clinical course and outcomes of critically in patients with neurological conditions such as cerebrovascular disease and dementia are worse with higher mortality rates (4). Patients with sequelae of paralytic poliomyelitis infection are at a risk of deterioration in mobility, respiratory capacity, and activities of daily living (5). It is not known whether COVID-19 infection would cause a severe and progressive course in these patients. Here we report a case with poliomyelitis sequelae diagnosed with COVID-19 acute respiratory distress syndrome (ARDS).

CASE

A 64-year-old male was referred to the emergency department on April 6, 2020 with fever, fatigue, myalgia, and diarrhea. Past medical history was not significant except for a history of paralytic poliomyelitis infection when he was 3 years old. There was no smoking history. He had weakness

Highlights

- There is a high risk for loss of muscle mass in coronavirus survivors discharged from ICU.
- It is important to encourage early mobilization to prevent post-ICU syndrome in COVID ARDS.
- The approach of early mobilization could provide successful recovery in polio sequelae.

in his right lower limb which enabled him to walk independently without any orthoses. Chest computed tomography showed bilateral infiltration and ground glass appearance in the lungs (Figure 1). Complete blood count revealed lymphopenia. He was hospitalized with the diagnosis of COVID-19 pneumonia and received hydroxychloroquine, azithromycin, and oseltamivir on admission. When the diagnosis of SARS-CoV-2 was confirmed in the patient with a positive multiplex RT-PCR test of a nasopharyngeal swab, we stopped oseltamivir. Following his admission to the ward, he was supported via an oxygen mask with a reservoir. Tocilizumab was administered upon increased IL-6 level on the 5th day. On the 7th day of his hospitalization despite the nasal high flow oxygen

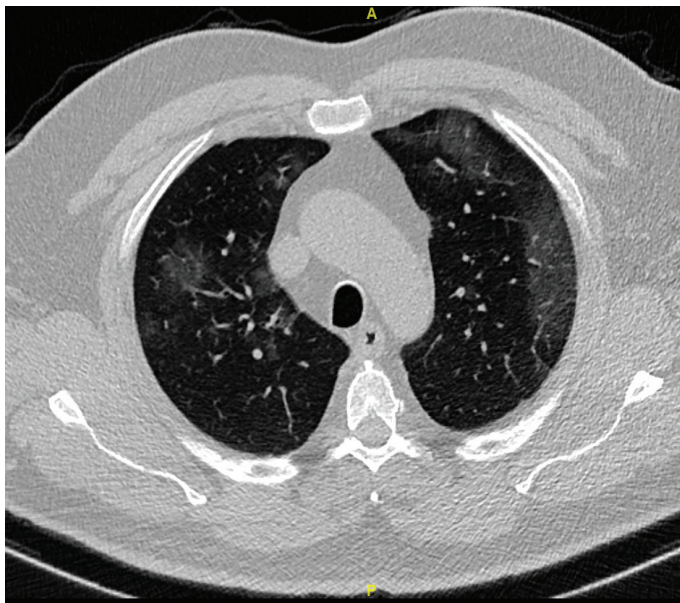


Figure 1. Computed tomography reveal ground glass appearance with bilateral infiltration in the lungs.

support, oxygen saturation remained less than 90% and he was transferred to the ICU. $\text{PaO}_2/\text{FiO}_2$ was 139 (moderate ARDS). He was supported with non-invasive mechanical ventilation for 7 days. Admission APACHE II score was 15 and the SOFA score was 3. He did not receive any steroid or sedative agents during the ICU stay since he had no hemodynamic instability and no need for invasive mechanical ventilation. He was seated and mobilized by the ICU nurses. He weighed 93 kg before ICU admission and 82 kg upon hospital discharge. He stayed 7 days in the ICU and 21 days in the hospital.

Four weeks following discharge he was evaluated in the follow-up visit at the Physical Medicine and Rehabilitation outpatient clinic. He had no complaints of weakness, pain, or dyspnea (Medical Research Council (MRC) dyspnea scale grade was 0). His body weight was 91 kg. According to the MRC muscle strength test, the patient's hip flexors were 4-, knee extensors 3-, ankle dorsiflexors 2, toe extensors 1, ankle plantar flexors 3 on the right side which he reported as same when compared to his previous condition. The other muscle strength grades were 5. He had an asymmetrical involvement due to right lumbosacral segments predominantly. He walked independently without any aid or assistive device. Right handgrip strength was 32 kg, left calf circumference was 43 cm. 6-minute walk distance (6MWD) was 420 meters. In the Short Form-36 questionnaire, the patient evaluated his current general health almost the same as compared to 1 year ago. Aerobic and strengthening exercises were recommended to improve his physical fitness.

DISCUSSION

To our knowledge, this is the first case with poliomyelitis sequelae who was diagnosed COVID-19 ARDS and recovered successfully without any signs of post-intensive care syndrome. It was noticed that the patient did not have any functional limitation or sarcopenia one month after discharge. His handgrip strength and calf circumference were greater than that of reported cut-off points to predict sarcopenia in the elderly living in the community. Cut-off points for handgrip strength and calf circumference were reported as <28.6 kg and <31 cm, respectively (6, 7). His 6MWD which is a reliable parameter of functional capacity was higher than the average value of poliomyelitis survivors (mean 394 ± 28 m) (8).

COVID-19 infection and ICU stay seemed not to result in worsening of poliomyelitis sequelae. There might be many reasons why our patient did not develop any additional loss of muscle strength. As patient-related factors, the absence of a post-polio syndrome (PPS) history and smoking can be suggested. As management-related factors, no support by an invasive mechanical ventilation, no steroids or sedative agents administered, sitting and mobilization exercises performed in the ICU despite the cytokine storm can be listed. However, in patients with severe ARDS and hemodynamic instability who require mechanical ventilation, the use of steroids can increase survival (9).

Myalgia and fatigue which were the presenting symptoms of COVID-19 in our patient might have been confused with PPS. This neurological condition manifests as new-onset, progressive muscle weakness, atrophy, fatigue, myalgia, arthralgia, or dysphagia affecting polio survivors, at least 15 years after the initial polio infection (10). The exclusion of other neurological, medical, and orthopedic problems is one of the criteria of PPS (11). During the pandemic, fever should be measured in polio survivors with symptoms of PPS to exclude COVID-19.

The limitation of this case is that electrophysiologic test was not performed. Because of the safety issues in performing electrophysiologic test during COVID-19 pandemic (12), we decided not to do these tests since the patient did not experience any new-onset weakness.

With this case, we want to draw attention to the rational use of steroids or invasive mechanical ventilation in COVID-19 ARDS and to promote early mobilization in the ICU to prevent post-intensive care syndrome. Additionally, with these measures, moderate COVID-19 ARDS did not prolong ICU stay in our patient with poliomyelitis sequelae. We believe that this management approach provided a successful recovery even in a patient with polio sequelae in a short period after COVID-19 ARDS.

Informed Consent: Written informed consent form was obtained.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept- MT; Design- MT; Supervision- ÖÖT, ZT; Resource- ÖÖT; Materials- MT; Data Collection and/or Processing- ZT, MT; Analysis and/or interpretation- ES; Literature Search- MT, ZT; Writing- MT, ÖÖT; Critical Reviews- ST.

Conflict of Interest: The authors declare that there is no conflict of interest.

Financial Disclosure: The authors declare no financial support.

REFERENCES

1. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases From the Chinese Center for Disease Control and Prevention. *JAMA* 2020;323:1239. [Crossref]
2. Ahmed H, Patel K, Greenwood DC, Halpin S, Lewthwaite P, Salawu A, et al. Long-term clinical outcomes in survivors of severe acute respiratory syndrome and Middle East respiratory syndrome coronavirus outbreaks after hospitalisation or ICU admission: A systematic review and meta-analysis. *J Rehabil Med* 2020;52:jrm00063. [Crossref]
3. Wang Z, Wang Z, Sun R, Wang X, Gu S, Zhang X, et al. Timely rehabilitation for critical patients with COVID-19: another issue should not be ignored. *Crit Care* 2020;24:273. [Crossref]
4. Yang X, Yu Y, Xu J, Shu H, Xia J, Liu H, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med* 2020;8:475-481. [Crossref]
5. Kidd D, Williams AJ, Howard RS. Poliomyelitis. *Postgrad Med J* 1996;72:641-647. [Crossref]
6. Yoo J-I, Choi H, Ha Y-C. Mean Hand Grip Strength and Cut-off Value for Sarcopenia in Korean Adults Using KNHANES VI. *J Korean Med Sci* 2017;32:868-872. [Crossref]

7. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyere O, Cederholm T, et al; Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2. Sarcopenia: revised European consensus on definition and diagnosis. *Age Ageing* 2019;48:601. [\[Crossref\]](#)
8. Gylfadottir S, Dallimore M, Dean E. The relation between walking capacity and clinical correlates in survivors of chronic spinal poliomyelitis. *Arch Phys Med Rehabil* 2006;87:944–952. [\[Crossref\]](#)
9. Mahase E. Covid-19: Demand for dexamethasone surges as RECOVERY trial publishes preprint. *BMJ* 2020;369:m2512. [\[Crossref\]](#)
10. Li Hi Shing S, Chipika RH, Finegan E, Murray D, Hardiman O, Bede P. Post-polio Syndrome: More Than Just a Lower Motor Neuron Disease. *Front Neurol* 2019;10:773. [\[Crossref\]](#)
11. Farbu E, Gilhus NE, Barnes MP, Borg K, de Visser M, Driessen A, et al. EFNS guideline on diagnosis and management of post-polio syndrome. Report of an EFNS task force. *Eur J Neurol* 2006;13:795–801. [\[Crossref\]](#)
12. Kassardjian CD, Desai U, Narayanaswami P; the AANEM Quality and Patient Safety Committee of the AANEM. Practical guidance for managing electromyography requests and testing during the COVID-19 pandemic. *Muscle Nerve* 2020;62:30–33. [\[Crossref\]](#)