CASE REPORT

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Never Neglect Rehabilitation

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ABSTRACT The most common coronovirus symptoms are persisting high fever, headache and dry cough for several days. However, some patients also experience symptoms such as sore throat, runny nose, loss of appetite, nausea or vomiting, muscle and joint pain, shortness of breath, cough with phlegm, severe respiratory failure and kidney failure. Geriatric population especially those with comorbidities are at high risk of developing serious illness and impairment in motor functions with severe acute respiratory syndrome-coronavirus-2 infection. It is common to ignore rehabilitation needs of geriatric patients while majoring on primary problems. A 91-year-old female coronavirus disease-2019 survivor, who did not directed to the rehabilitation and became immobile due to a severe infection is presented here to highlight the significance of rehabilitation. The multitude of internal problems and the shortness of expected life time of our patient has caused to disregarded about her musculoskeletal system problems, functionality and quality of life.

Keywords: COVID-19; rehabilitation; geriatrics

Although coronavirus disease-2019 (COVID-19) primarily affects the respiratory system, our understanding of its sequelae and long-term outcomes after a period of 2 years of pandemic is still incomplete.[1] While rehabilitation practitioners were dealing with acute respiratory complications and pulmonary rehabilitation at the beginning of pandemic, complications due to hospitalizations, weight loss, loss of muscle mass and bed sores became the main musculoskeletal problems to deal with in the long term.

A 91-year-old female COVID-19 survivor is presented here, who was immobile for a long time due to a severe infection, to emphasize the importance of rehabilitation.

CASE REPORT

A 91-year-old woman previously diagnosed with hypertension and right hip prosthesis operation 17 years ago, hospitalized for severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) infection confirmed by positive nasopharyngeal swap test and bilateral diffuse involvement compatible with COVID-19 on thorax computed tomography scan. She was medicated with favipravir and methylprednisolone at the first step and broad spectrum antibiotics were given due to methicillin resistance *Staphylococcus aureus* proliferation on blood culture and *Escherichia coli* on urine culture during hospitalization. She was also given subcutaneous enoxaparin because of high D-Dimer. She had hypoxia in arterial blood gas, she took oxygen with reservoir mask. Total parenteral nutrition was given due to insufficient oral intake. After a week her oxygen requirement was decreased, oral intake was better, her electrolytes were regulated, blood pressure was taken under control. Her antiviral treatment and antibiotherapy were completed and she was discharged.

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She was bedridden for 2.5 months at home and became immobile because of chronic fatigue, deconditioning and weakness. Decubitis ulcer on right trochanteric region developed during bed rest and then she hospitalized again to plastic and reconstructive surgery department. Debridement operation was done and wound culture taken. Then her treatment continued with VAC and dressing. Proteus and *Klebsiella* reproduced in the wound culture. Department of infectious diseases was consulted and antibiotherapy was arranged and she was taken to contact isolation. After 2 weeks 2nd wound debridement operation and reconstruction with fasciocutaneous flap was performed.

We transferred her to physical medicine and rehabilitation (PMR) clinic for rehabilitation and ambulation. On admission, she was able to turn inside the bed with support. She had balance of short and long sitting, but no standing balance. She could not ambulate. Her upper extremity range of motions (ROM) were bilaterally complete. The active hip flexion was 60° on right, 40° on left. Passive hip flexions were 100° on both sides. Hip abduction was complete on the right, 40° on the left and adduction was complete on the right, 20° on the left. Knee flexion and extension were minimally limited. Ankle dorsi-flexion and plantar-flexion was bilaterally complete. Muscle strength was 5/5 globally for bilateral upper extremities. Hip flexors were 1/5 on right, 2/5 on left. Knee extensors and ankle plantar flexors were 3/5 on both side. Ankle dorsiflexors were 5/5 on right, 4/5 on left side. Both upper and lower extremity deep tendon reflexes were normoactive. Superficial and deep sensorial examinations was found normal.

Rehabilitation program was aimed to ambulation, maximize the mobilization and functional status of the patient. Active-assisted and active ROM exercises for cervical and upper and lower extremity joints were performed in all directions. Isometric and isotonic strengthening exercises for upper and lower extremity, back extensor and abdominal muscles were done. Mobilization activities were performed to improve in-bed activities such as turning and sitting. Balance and coordination exercises were applied. She received posture training and exercises. Stepping and walking exercises with parallel bar were added in following process. Respiration exercises were also done. The program was implemented 5 days a week for 2 hours accompanied by physiotherapist for 50 sessions. The patient performed her exercises that she could on her own and with her caregiver in the remaining times. At the end of the rehabilitation program, she was able to do all in-bed activities on by her own, ambulate with walker. No cardiopulmonary complications or exercise-induced desaturation developed during rehabilitation procedures. The wound dressings were followed and the stitches was removed by plastic surgery while the patient was in PMR clinic.

A written informed consent was obtained from the patient.

DISCUSSION

SARS-CoV-2 infection can be acquired at any age, but older adults especially those with comorbidities are at high risk of developing more serious illness and impairment in motor functions.[2] We presented a 91-year old COVID-19 survivor rehabilitation here. With this case we verified the importance of the rehabilitation in COVID-19 infection associated disability in geriatric patients.

Because COVID-19 is a new disease, a lot of information has been derived from inferences from previous long-term diseases. Aforementioned topics of rehabilitation problems are musculoskeletal pain, muscle weakness, reduced joint mobility, balance and gait changes, standing difficulty, limitations in daily living activities, critical myopathic and neuropathic illness, dysphagia, emotional problems, mental confusion and memory changes.[3] The goals of the rehabilitation process in the medium and long term should be these deteriorations that occur in the post-acute period.[4]

Some articles on COVID-19 rehabilitation have been published since the beginning of the pandemic. Many of them make strong recommendations for the rehabilitation of COVID-19 patients and describe geriatric rehabilitation with emphasis on pulmonary or respiratory rehabilitation.[5] Although geriatric patients are more prone to musculoskeletal disabilities,

the literature on locomotor system rehabilitation of geriatric COVID-19 patients is not sufficient. There are few studies targeting these patients and describing clinical conditions and appropriate therapy.[6]

Taking into account the patient's current functional and cognitive status and comorbidities, rehabilitation should be planned individually.[7] The aim should be to prevent complications and sequelae during hospitalization and after discharge and to provide rehabilitation. Since most of the sequelae are related to the musculoskeletal system, exercise is an indispensable part of the treatment. Due to rapid oxygen desaturation, early intense physical activity or exercises cannot be tolerated.[3] Depending on the disability, physical activities should be programmed slowly and gradually until the patient returns to her/his previous capacity. In a randomized study, it was shown that a 6-week rehabilitation program aimed at self-help was more successful in reducing depression and improving physical capacity than other non-innovative methods.[8]

Data on the long-term consequences of COVID-19 disease and the extent of damage are still insufficient. It is necessary to continue to explain the clinic of the disease and to carry out long-term studies in order to develop better rehabilitation strategies. Early physical and pulmonary rehabilitation will shorten the hospital stay and prevent long-term complications. PMR physicians and their team have specific role to improve functional capacity, avoid problems caused by disability and increase life quality of COVID-19 patients.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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